Cultural life scripts structure recall from autobiographical memory

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Three classes of evidence demonstrate the existence of *life scripts*, or culturally shared representations of the timing of major transitional life events. First, a reanalysis of earlier studies on age norms shows an increase in the number of transitional events between the ages of 15 and 30 years, and these events are associated with narrower age ranges and more positive emotion than events outside this period. Second, 1,485 Danes estimated how old hypothetical centenarians were when they had been happiest, saddest, most afraid, most in love, and had their most important and most traumatic experiences. Only the number of positive events showed an increase between the ages of 15 and 30 years. Third, undergraduates generated seven important events that were likely to occur in the life of a newborn. Pleasantness and whether events were expected to occur between the ages of 15 and 30 years predicted how frequently events were recorded. Life scripts provide an alternative explanation of the reminiscence bump. Emphasis is on culture, not individuals.

Theories of autobiographical memory generally focus on the level of the individual and minimize the impact of culture on the content and structure of autobiographical memory. In contrast, we have recently argued that the recall of emotionally charged memories may be shaped by *life scripts*—that is, culturally shared expectations as to the order and timing of life events in a prototypical life course (Berntsen & Rubin, 2002; Rubin & Berntsen, 2003). In the present article, we develop a formal theory of life scripts. We provide evidence for the existence of life scripts, and we show the relevance of life scripts to our understanding of autobiographical memory in general and to the reminiscence bump in particular. We start by reviewing the recent findings on the bump that motivated our theory of life scripts. We then develop a formal theory of life scripts and a set of predictions derived from this theory. We next reanalyze findings on cultural age norms in sociology, anthropology, and psychology, showing that they are consistent with our predictions. In Study 1, we replicate earlier findings on age norms for emotional events in a large stratified sample. In Study 2, we provide direct evidence for the existence of life scripts for a series of events. We show that life scripts are typically associated with role transitions and that they favor positive events and events occurring in youth, thereby mirroring findings on autobiographical memories. Finally, we argue that life scripts have broad theoretical and methodological implications for research on autobiographical memory by moving the analysis from the individual to the cultural level.

The *Bump* for Autobiographical Memories

When autobiographical memories are sampled via a word-cuing method (Crovitz & Schiffman, 1974), the distribution of memories across the life span deviates from a monotonically decreasing curve by showing an increase in the number of memories from the second and third decades of life. This *bump* was pointed out by Rubin, Wetzler, and Nebes (1986) in a reanalysis of data from several studies on word-cued memories and has been replicated numerous times (e.g., Hyland & Ackerman, 1988; Jansari & Parkin, 1996; Rubin & Schulkind, 1997a, 1997b; see Rubin, 2002, for a review). Subsequent research has shown a larger percentage of memories in the bump and no recency effect if, instead of being cued by words, participants are asked for their most vivid memories (Cohen & Faulkner, 1988; Fitzgerald, 1988), memories that should go into the book of their life (Fitzgerald, 1996), their most important memories (Rubin & Schulkind, 1997b), or their life stories (Fromholt & Larsen, 1991, 1992). Rubin and Schulkind (1997b) asked the same group of sixty 70-

to 73-year-old participants to recall memories in response to cue words and to recall five memories in response to a request for their most important memories. The bump for word-cued memories included 17% of the memories, whereas the bump for important memories included 57% of the memories. Recently, Berntsen and Rubin (2002) showed that involuntary memories followed the same pattern as the word-cued memories.

Surprisingly, no bump is found when people are asked for their most negative memories. Berntsen and Rubin (2002) asked a sample of 1,241 respondents how old they had been at the time of their most important, their happiest, their saddest, and their most traumatic memory. For respondents over 40 years of age, there was a clear bump in the 20s for the most important and happiest memories; in contrast, the data for the saddest and most traumatic memories could be accounted for by a monotonically decreasing retention function. This finding was replicated by Rubin and Berntsen (2003), who asked a representative sample of 1,307 respondents how old they had been when they felt most afraid, most proud, most jealous, most in love, and most angry. Respondents were also asked when they had experienced their most important event and whether this event was positive or negative. Again, there was a bump for positive but not for negative events. One might argue that these findings simply reflect that life is better in young adulthood than at any other time. However, this explanation can be ruled out by the fact that a similar dissociation between positive and negative memories is not found when recall is triggered by word cues. Rubin and Schulkind (1997b) found no dominance of positive memories in the bump period relative to other periods of life. Jansari and Parkin (1996) examined word-cued memories retrieved within either early life or midlife and found no difference on valence ratings for the two classes of memories.

Fitzgerald (1988) argued that the bump reflects the formation of a stable self-narrative in the second and third decades of life, and—following Erikson's (1950) theory of psychosocial development—called it an "identity effect" (Fitzgerald, 1996, p. 374; see also Fitzgerald, 1992). A self-narrative was described as a "set of stories that defines who we are in narrative rather than declarative terms" (Fitzgerald, 1988, p. 269). Much in the same way as the novel uses the narrative form to reveal the nature of characters, the self-narrative reveals and maintains the nature of the self via the stories it includes. Many scholars have supported and maintained the idea that a stable self-concept is developed during young adulthood, giving this period a privileged position in the life narrative and thereby providing an explanation of the bump (e.g., Bluck & Habermas, 2000; Conway & Pleydell-Pearce, 2000; Neisser, 1988).

Although the self-narrative explanation may explain why the bump is more pronounced in memory tasks instigating a strategic search than in memory tasks based on associative retrieval (such as word cues), it has difficulties in accounting for the differences between positive and negative memories in relation to the bump. According to Bruner (1988), narratives deal with "human or human-like intention and action and the vicissitudes and consequences that mark their course" (p. 13), and they convince with their "lifelikeness" (p. 11). They typically start with a stable state, which is breached, followed by a crisis and a struggle to overcome it. Thus, if the bump reflects the way in which we narrate the development of our adult identity, it should contain memories of important troublesome events, as well as happy events to the extent that they provide closure (see Berntsen & Rubin, 2002, for a discussion of this issue). As was argued by Berntsen and Rubin (2002), the self-narrative explanation of the bump can account for the absence of a bump for negative memories only if it becomes modified by some other theoretical notion, such as repression, dissociation, or social censure.

In contrast to a self-narrative explanation, in the life script explanation introduced by Berntsen and Rubin (2002) and elaborated by Rubin and Berntsen (2003), the bump, and the dissociation of positive and negative memories in relation to it, primarily derive from shared cultural ideas about the order and timing of major life events— for example, graduation, first employment, marriage, and childbirth. Such events have been described by sociologists (e.g., Neugarten, Moore, & Lowe, 1965). A life script is a schema of such normative events. The life script account is an alternative to theories that explain the process of retrieval and narration of the personal past in terms of cognitive and emotional structures evolving from the life of the individual, such as life time periods, general events and goals specific to the self (Conway & Pleydell-Pearce, 2000), personal landmark events (Shum, 1998), or turning points (Clausen, 1995). Although life scripts help to structure individual life narratives, the two concepts are theoretically and empirically distinct. A life script is a culturally shared part of our semantic knowledge, whereas a life story is unique, individual, and part of our autobiographical knowledge. A life script is measured by a request for the events of a stereotypical life within a given culture. A life story is measured by asking an individual to tell about his or her life (Berntsen & Rubin, 2002; Rubin & Berntsen, 2003).

The life script account has important methodological advances over the previous explanations of the bump. First, it has the potential of making specific, testable predictions as to where in the life span bumps for different types of memories would be located. Second, the life script account predicts individual recall on the basis of measures that are independent of that particular individual's life. In the following section, we will develop a formal theory of life scripts and then provide evidence for their existence and their impact on autobiographical memory.

What is a Life Script?

Our notion of life script combines the concept of *script* as developed by Schank and Abelson (1977) with the idea of age stratification and culturally sanctioned age norms

from research in anthropology and sociology (e.g., Foner & Kertzer, 1979; Fry, 1980, 1983; Neugarten, 1968; Neugarten & Hagestad, 1976; Neugarten et al., 1965; Settersten & Hagestad, 1996a, 1996b). The life script explanation has its starting point in the observation that every society has age norms that structure expectations and regulate behavior. As Neugarten et al. (1965) pointed out, "There exists what may be called a prescriptive timetable for the ordering of major life events: a time in the life span when men and women are expected to marry, a time to raise children, a time to retire" (p. 711). Not only are people aware of the age norms of their culture, but they are also aware of their own timing in relation to these norms—that is, whether they are earlier or later than expected with respect to major events (e.g., Shai, 2002).

A *script* is a series of events that unfolds in a specific order, with each event enabling the events that follow, and composes a stereotypical episode, such as eating in a restaurant (Schank, 1982, 1999; Schank & Abelson, 1977). In the same way, a life script represents a series of events that take place in a specific order and represents a prototypical life course within a certain culture (Rubin & Berntsen, 2003). More formally, a script consists of *slots*, and *requirements* about what can fill the slots (Schank & Abelson, 1977). In life scripts, the slots are culturally important transitional events that are expected to occur within a circumscribed age span in the life course of individual members of the culture. The most important requirements are (1) cultural age norms, prescribing an appropriate age for the event in question, and (2) norms of culturally expected and (to a lesser extent) causal sequencing, ascribing a specific order to the event in a series of succeeding events (e.g., finish school, get a job, get married, and then have the first child).

Only events considered to be important, expected transitional events in the cultural context are included in the life script. Some events may be highly *personally* significant without fulfilling these requirements (e.g., a serious accident or winning the lottery). Such events would be associated with no age norms, according to this account. Culturally important and expected transitions that happen "on time" are often considered positive (Luborsky, 1993; Rubin & Berntsen, 2003) and are typically celebrated socially, whereas transitional events that are "off-time" (e.g., pregnancy in adolescence) are often seen as stressful and socially stigmatizing (Neugarten & Hagestad, 1976). The life script therefore represents an *idealized* life story. Although a restaurant script may be said to represent an averaged version of many recurrent visits to restaurants (Abelson, 1981), the life script does not depict an *average life*, because an average life would have to include many events that are common but not culturally expected (e.g., divorce). Since we live only once, the life script is not learned from personal actions in recurrent contexts, in contrast to the event script introduced by Schank and Abelson (1977). Instead, the life script is handed down from older generations, from stories, and from observations of the behavior of other, typically older, people within the same culture.

Schank and Abelson's (1977) script notion refers to a hierarchical arrangement, with series of specific actions or episodes linked to a superordinate scene in the overall event sequence. For example, in the restaurant script, *ordering* consists of four episodes: receiving the menu, reading the menu, deciding what one wants, and ordering to the waiter (Schank & Abelson, 1977, p. 424). In the same way, a life script is a hierarchical arrangement, with specific episodes nested under each of a series of superordinate transitional events. For example, *marriage* includes many specific actions or episodes, such as deciding on a date, talking to the priest, buying a dress or suit, the wedding ceremony, having pictures taken, meeting with friends and family, having a banquet, dancing, leaving the party, going on a honeymoon, and so forth. Thus, each transitional event in the life script may be most appropriately viewed as an extended event (Barsalou, 1988) under which many specific and culturally expected episodes are nested.

As has been pointed out in the sociological literature, role transitions take place in culturally defined role contexts, of which the most important ones are work and family (Fry, 1983). Since life scripts deal with role transitions, knowledge of role contexts is likely to also organize life scripts. We assume that life scripts tend to include only events associated with culturally important role contexts. One might speculate that each role context has its own timeline so that the life script includes and integrates several timelines, each specific to a certain role context. The present studies are not designed to separate the different timelines.

The script concept was introduced by Schank and Abelson (1977) as a way of explaining the processing of stories. In a similar way, life scripts are used in the construction and understanding of life stories, in addition to other conventions, such as Gricean norms of communication (Grice, 1989). The importance of cultural norms for the understanding and construction of life stories has been mentioned by other theorists (e.g., Bluck & Habermas, 2000; Fitzgerald, 1988; Fromholt & Larsen, 1992; Luborsky, 1993; Robinson, 1992). However, in these theories, the information provided by culture is described in abstract terms rather than as a specified, formal structure guiding recall.

Some autobiographical memory tasks are more likely than others to activate life scripts. A request for a memory associated with a random word is less likely to activate the life script than a request to tell one's life story. Specifically, we have argued that a request for extremely positive and important memories would be likely to activate a person's life script, because most culturally expected transitional events are considered positive and important. A request for extremely negative events, on the other hand, would be less likely to activate life scripts, because highly negative events typically consist either of deviations from the timing and sequencing of the life script or of nonscripted events (Rubin & Berntsen, 2003).

How do life scripts influence the retrieval of memories cued by requests for emotional events? Life scripts pro-

vide search descriptions for times when one is most likely to have experienced the emotion concerned. So, for questions such as "When were you most happy?" or "When were you most in love?" there are classes of events in which one is most likely to have experienced such emotions, and these fall into a time period linked to one or more important, transitional events. Even though being sad and angry may be as expected and as common as being happy and in love over the entire lifetime, there is no particular time period to search for classes of events with these emotions. If certain types of events are not allocated to a specific time slot in a life script, they will not benefit from a life script that supports and structures retrieval and thus, by default, should show the monotonically decreasing retention function of normal forgetting, consistent with the results of our previous studies of participants' memories for their most negative events (Berntsen & Rubin, 2002; Rubin & Berntsen, 2003). On the other hand, we hypothesize that the results for participants' highly positive or important memories should show a bump in young adulthood, because this is the prime time for such events according to the predominant life script within our culture.

How do life scripts influence recall of memories cued by neutral words? Life scripts are unlikely to structure the retrieval of word-cued memories, because such memories are brought to mind via an associative, nonstrategic search process. The same is true for involuntary memories, which are triggered by random environmental cues (Berntsen, 1996). However, this does not necessarily mean that the life distribution of such memories is uninfluenced by life scripts. In addition to structuring retrieval, life scripts may influence encoding and retention by providing more cultural importance and more opportunities for rehearsal of events that fit the script, as compared with events that do not, and thus increase the accessibility of the former—a point we will develop later.

In sum, our notion of life scripts has the following ten properties. The first six properties follow from Schank and Abelson's (1977) script notion, whereas the last four differ from it. (1) A life script is semantic knowledge about the expectations in a given culture about life events, not a form of episodic memory for those events. (2) A life script is a series of temporally ordered events. (3) A life script can be described in terms of slots and their requirements. (4) Life scripts form a hierarchical arrangement, with transitional events forming a higher order "scene" in which a series of subordinate actions or episodes are nested. (5) Life scripts are used to process stories—here, life stories. (6) The slots and their requirements for life scripts are culturally important transitional events and their culturally sanctioned timing. (7) Because life scripts represent a normative life course, life scripts are not extracted from personal actions in recurrent contexts but are transmitted by tradition. Young people who have lived through only a small part of their lives know the life script of their culture. (8) Life scripts do not represent an average life but instead represent an idealized life, in that many com-

mon and important events are left out. (9) Life scripts are distorted from actual lives to favor positive events. (10) Life scripts are distorted from actual lives to favor events expected to occur in the period covered by the bump.

We present evidence for life scripts in three ways. First, we reanalyze previous anthropological, sociological, and psychological studies on age norms. Second, in Study 1, we replicate findings reported by Rubin and Berntsen (2003) in a large stratified sample. Third, in Study 2, we provide direct evidence for life scripts. The evidence provides support for Claims 1, 2, 6, 7, 8, 9, and 10, although Claims 3, 4, and 5 are not directly addressed.

A Reanalysis of Findings on Cultural Age Norms

According to the theory just outlined, life scripts serve to define the occurrence of transitional events in a typical life. Most of these should be expected to occur in the period of the bump. Moreover, if life scripts are the basic cognitive structure for cultural age norms, age norms for transitional events should have better defined time periods than other age norms. Age norms for positive events should have better defined time periods than age norms for negative events, and age norms for events expected in the period of the bump should have better defined time periods than events outside this period. In the following, we reanalyze findings from anthropological, sociological, and psychological studies on age norms, showing that they are consistent with these predictions. All of the studies have used events chosen by the experimenter and have provided no independent measures for the representativeness of these events (a problem we remedy in Study 2). One premise for this and the analyses in Studies 1 and 2 is that the more responses from different participants agree, the more likely they are to reflect shared, underlying representations.

Neugarten et al. (1965) asked 93 middle-class males and females, 40–70 years of age, a series of 19 questions on their perception of age norms. Although Neugarten et al. did not make this distinction, the questions addressed three different classes of age norms. First, seven were concerned with transitional events ("When do you think is the best age to finish school and go to work . . . to be settled on a career . . . for a man to marry . . . for a woman to marry . . . for most men to hold their top jobs . . . when most people should become grandparents . . . to be ready to retire?"). Second, six questions addressed age norms for what are called *age grades* in the anthropological literature—that is, the division of the life course into segments (see, e.g., Fry, 1980; "Which age comes to your mind when you think of a 'young man' . . . 'a middle-aged man'. . . 'an old man' . . . 'a young woman' . . . 'a middle-aged woman' . . . 'an old woman'?"). Third, six questions were concerned with age statuses (see, e.g., Fry, 1980; "At what age do you think a man has the most responsibilities, accomplishes most, the prime of life for a man, when a woman has the most responsibilities, accomplishes most, is good-looking?"). The responses for all the ques-

tions were sorted into age ranges "selected by the investigators to produce the most accurate reflections of the consensus that existed in the data" (Neugarten et al., 1965, p. 713). When we reanalyzed Neugarten et al.'s data on the age ranges according to the three classes of questions presented above, it became clear that the age ranges for the transitional events (2–5 years, with a mean span of 4.1 years) were narrower than the age ranges for age grades (4–15 years, with a mean span of 9.2 years) and the age ranges for age statuses (5–15 years, with a mean span of 14.2 years). Thus, participants in Neugarten et al.'s study agreed more on the age estimates for the transitional events than on the ages for the other two categories, supporting our assumption of a culturally shared life script for transitional events. Furthermore, four of the seven transitional events included in their study (three of six, if marriage for men and women were taken together) were estimated to take place between the ages of 15 and 30 years. As a baseline, if the average life span is assumed to be 75 years, then the 15 years covered by the bump should have only 20% of the transitional events. Neugarten et al.'s results support our assumption that cultural life scripts predict more transitional events to happen in youth than in other life periods.

In order to observe possible changes in the age estimates over time, Zepelin, Sills, and Heath (1986) replicated Neugarten et al.'s (1965) study. We reanalyzed the data presented by Zepelin et al. according to the same three categories of questions as those used in the reanalysis of Neugarten et al. Again, four of the seven transitional events (three of six, if marriage for men and women were treated as one event) were estimated to happen between the ages of 15 and 30 years and, thus, in the bump period. Unlike Neugarten et al., Zepelin et al. presented means and standard deviations for the age estimates. The standard deviations, averaged across the four transitional events in the bump period, were smaller than the standard deviations averaged across the three events outside the bump period (4.0 vs. 7.3), indicating more agreement across participants for the former. The age ranges for the seven transitional events (5–20 years, with a mean span of 10.4 years) were narrower than the age ranges for age grades (17–25 years, with a mean span of 19.8 years) and the age ranges for age statuses (15–20 years, with a mean span of 16.7 years). The means of the standard deviations calculated for the three classes of events were 5.4, 8.8, and 7.2, respectively. Thus, although the age ranges with the most agreement had moved and had become less narrow since Neugarten et al. presented their pioneering work, most agreement was still found on the temporal location of transitional events, consistent with the assumption of an underlying life script for such events.

This is also in agreement with Byrd and Breuss (1992), who contrasted estimates of the appropriate ages for eight transitional events (termed *milestones* in their study) with age estimates of the appropriate ages for showing various personality traits and attitudes (such as having the most self-control or being the most ambitious) and age statuses (the prime/worst of life for a man/woman). Agreement across gender and age groups was found only for the transitional events. No standard deviations were presented, so it is not possible to see whether these were lower for the transitional events. The included transitional events (and their mean age estimates, in years, for males and females) were leaving home (18.4/19.8), beginning to work full time (21.1/20.7), being established in a career (25.3/23.9), marrying (26.3/23.2), becoming a parent (28.7/24.5), being at the top of one's career (50.4/43.8), becoming a grandparent (51.9/48.1), and retirement (64.9/60.2). The mean age estimates of five of the eight events were between the ages of 15 and 30 years for both males and females and, thus, in the period of the bump.

Fry (1983) asked 242 adults to estimate the most likely ages for a series of transitional events and life phases. The events (with the means, in years, of the age estimates) were first job (20.0), marriage (21.4), preschool children (24.1), first promotion (25.5), school children (30.4), greatest job responsibility (38.3), children leave home (42.6), widowed (58.4), retirement (59.1), live in nursing home (74.6). Five of the 11 included events were estimated to take place between the ages of 15 and 30 years. A reanalysis of Fry's (1983) Table 1 showed that the means of the standard deviations for the age estimates were less than half as big for events estimated to occur in the third decade of life than the means of the standard deviations for the age estimates of the events outside the third decade (3.2 vs. 6.8, respectively). Thus, the respondents agreed more on the age estimates for those events that they generally expected to take place in young adulthood than on those they did not.

Settersten and Hagestad (1996a, 1996b) asked 319 adult Americans in the Chicago metropolitan area to estimate by what age 11 important life transitions should occur. Their six family transitions (with the means of the expected ages, in years, for males and females) were leaving home (21.7/21.9), returning home (27.1/28.2), marrying (27.9/26.0), entering parenthood (29.9/28.8), completing child bearing (44.1/39.1), and entering grandparenthood (52.3/51.0). Their five educational and work transitions (with the mean ages) were entry into full-time work (22.8/21.7), exit from full-time schooling (26.4/25.5), settling on career/job area (29.0/28.9), reaching the peak of the work career (41.7/39.8), and entering retirement (61.3/59.3). Seven of the 11 transitions were expected to be accomplished between the ages of 15 and 30 years for both males and females. A reanalysis of the standard deviations of the age estimates showed that these were smaller for the seven events expected to take place between the ages of 15 and 30 years than for those outside of this range (4.1 vs. 6.9).

To study the normative ages for emotionally charged events, Rubin and Berntsen (2003) asked 87 undergraduate psychology majors to estimate the most likely ages for a series of emotionally charged events in an average

person's life. For each event, participants rated on a 7-point scale how confident they were in their estimates. The events (and their mean confidence ratings) were most in love (4.77), most important (4.59), happiest (4.26), proudest (4.13), saddest (4.06), most jealous (3.85), most afraid (3.72), most traumatic event (3.07), and most angry (2.97). Thus, the students were more confident in their estimated ages for important and positive events than in their age estimates for negative events. Also, smaller standard deviations on the age estimates were found for the former, and a significant correlation was obtained between the standard deviations and the confidence ratings. This result indicates that the confidence ratings measured the extent to which the dated events were allocated a specific slot in a life script; when individual participants were more confident of their estimated dates, the dates were more similar across participants. Furthermore, estimates for the positive events peaked in young adulthood, whereas the estimates for negative events showed either a peak later or earlier in life or a slow increase over life. The age estimates for positive and important events matched the data obtained in two survey studies of autobiographical memory for emotional events (Berntsen & Rubin, 2002; Rubin & Berntsen, 2003), whereas the responses for negative events did not or did so to a much smaller extent.

To sum up, our review of previous studies on age norms has shown that people agree more on estimates of the appropriate ages for transitional events (e.g., marriage) as compared with age grades (e.g., when is a person young?) and age statuses (e.g., when is the prime of life?). More of the transitional events included in these studies were expected to take place in the period of the bump than in other periods of life. Furthermore, people agreed more on the age estimates for transitional events that were expected to take place during the period covered by the bump, as compared with events that were estimated to happen outside the age range of 15 to 30 years. When asked to estimate the most likely ages for a series of emotionally charged events in an average person's life, undergraduates were more confident dating positive than negative events, and when they were confident, the distribution of their responses matched the recall of emotionally charged autobiographical memories across the life span. Taken together, these findings support our assumption of a culturally shared life script for transitional events that favors positive events and events expected to occur in young adulthood and thereby may be able to explain findings on recall from autobiographical memory. However, before we can draw this conclusion, Rubin and Berntsen's (2003) study of normative ages for emotionally charged events needs to be replicated in a population that matches the population from which the recall data were derived—that is, a stratified sample of Danes. Study 1 serves to fulfill this purpose. It also remains to be established whether a life script for transitional events can account for the data pattern obtained by Berntsen and Rubin (2002) and by Rubin and Berntsen's (2003) study—that

is, whether a life script for transitional events shows the same pattern with respect to positive and negative events as the study of age norms for emotional events. Finally, it remains to be clarified whether the samples of transitional events that past investigators have chosen to include in the studies reviewed are in fact representative of the types of events included in life scripts—that is, whether these preselected events from the age norm literature reflect an underlying cultural life script. How should one go about collecting empirical data on such hypothetical shared knowledge structures? A standard way to obtain a schema, independent of the recall of actual instances, is to have people generate imaginary instances of the schema of interest (Rubin & Kontis, 1983; Rubin, Stolzfus, & Wall, 1991; Rubin, Wallace, & Houston, 1993). We did so in Study 2, when we asked people to generate and date important events that are likely to occur in a prototypical life course.

STUDY 1

Method

Participants. A representative sample of Danes participated as part of an omnibus survey by Gallup Public, Denmark. In each household, 1 or 2 respondents were randomly selected via a combined criterion based on number of household members above age 16 and their birthdays. Response rates for the entire omnibus survey were 58%. To exclude minors and provide conventional decade boundaries, only respondents above the age of 19 were included in the present study. Table 1 shows the number of male and female respondents sorted by decade of life.

Procedure. The data were collected by 78 interviewers via face-to-face interviews in Danish in the respondents' homes. The questions of relevance for the present study were preceded only by demographic questions in the omnibus survey. The respondents were informed that the purpose of the present study was to obtain information about the kind of expectations that people have about a typical life course and to investigate people's ideas as to at what ages certain events are expected to take place in a normal life course. It was emphasized that the questions did not address the respondents' own personal life, but the life course of an average person. The life of a 100-year-old person was chosen, because none of the respondents was this old. The instructions were read aloud by the interviewer and were printed on a card that was shown to the respondent. Translated into English, they were as follows: "People are getting older nowadays. It is no longer unusual to live to become a hundred years old. Imagine a quite ordinary man/woman [the gender used matched the respondent's], who has become a hundred years old and who is looking back at his/her life, thinking about a series of different events. Your task is to estimate the person's age at the time when each of these events took place. If you have no idea as to when an event is most likely to have occurred, use your best guess. There are no correct or incorrect answers. We are inter-

Table 1
Participants in Study 1

Age Range	N	Females
20–29	226	116
30–39	291	136
40–49	259	145
50–59	280	127
60–69	199	107
70–99	230	150

Table 2
Questions for Study 1

At some point in his or her life, this 100-year-old person has experienced an extremely happy event. How old do you think he or she was on the day when his or her happiest experience took place?

At some point in his or her life, this 100-year-old person has experienced an extremely sad event. How old do you think he or she was on the day when his or her saddest experience took place?

At some point in his or her life, this 100-year-old person has had an extremely important experience which made big changes in his or her life or outlook. How old do you think he or she was on the day when his or her most important experience took place?

At some point in his or her life, this 100-year-old person has experienced a traumatic event in which he or she or someone else was seriously injured, maybe his or her own life or the life of someone else was in serious danger and he or she was feeling deeply shocked, helpless, very afraid, and did not know what to do. For example, traumas may include serious accidents, assaults, abuse, the sudden death of somebody, life-threatening diseases, military combat, torture, etc. How old do you think he or she was on the day when his or her most traumatic experience took place?

At some point in his or her life, this 100-year-old person has experienced an event in which he or she felt extremely in love. How old do you think he or she was on the day when he or she felt most in love?

At some point in his or her life, this 100-year-old person has experienced an event in which he or she was extremely afraid. How old do you think he or she was on the day when he or she felt most afraid?

ested in your intuition about when each of these events is most likely to occur for a typical person." An English version of the questions is presented in Table 2. For each question, the participants gave an age estimate. Afterward, they rated how confident they were that their estimate was in the right decade of the imagined person's life. The scale had 7 points (1 = *I have absolutely no confidence*; 7 = *I am totally confident*).

The questions were presented in randomized order. The interviewer recorded responses on a laptop computer. To ensure understanding, each question and the response options for each question were printed on a demonstration card, which was shown to the respondent while the question was being asked. If the respondent preferred, he or she could read the questions and response options directly from the computer screen.

Results

Because there were only small age and gender differences in the distributions of responses, we first provide the aggregate distributions in Figure 1 and discuss them before examining the deviations from them. The standard errors were small, because there were 1,485 respondents. They were at most 1.3%, and so were too small to show on the figure. As was predicted, there were clear bumps for the most important, most happy, and most in love events. All three events will be labeled *positive* when mentioned together, because our earlier work has shown that the majority of events retrieved in response to a request for most important events are positive (Rubin & Berntsen, 2003). For most important events, the peak was in the 20s and 30s; for most happy, in the 20s; and for most in love, in the teens and 20s. For these three questions, 63%, 75%, and 90%, respectively, of the responses occurred in bump periods specific to the event—that is, in the two consecutive decades with the most responses.

Thus, in agreement with our earlier work, these three positive events were expected to occur in slightly different but still highly circumscribed time periods in young adulthood. For the three negative events—most sad, most afraid, and most traumatic—there were flatter distributions, with 37%, 33%, and 46%, respectively, of the responses falling within the two consecutive decades with the most responses, which thus reflects less agreement as to when these events are expected to take place in life.

Another measure of the level of agreement across respondents is the standard deviations of the age estimates for the events. In agreement with our expectations and the findings presented above, the standard deviations were lower for most important, most happy, and most in love events (14.63, 13.76, and 9.19, respectively) than for the most sad, most afraid, and most traumatic events (20.33, 22.33, and 17.83, respectively). The largest standard deviation of the three positive events is smaller than the smallest standard deviation of the three negative events [$F(1483,1483) = 1.49, p < .0001$].

Confidence ratings. To the extent that the age estimates reflect shared underlying scripts, we should expect respondents to be fairly confident in their age estimates. As was expected, the respondents' mean ratings of how confident they were that the event would fall within ± 5 years of the selected date were higher for the three positive events taken together than for the three negative events taken together [$M = 5.29$ vs. 4.78; $F(1,1431) = 375.92, p < .0001$]. Individually, most important, most happy, most in love, most sad, most afraid, and most traumatic events had means of 4.99, 5.38, 5.52, 4.95, 4.77, and 4.63, respectively. Moreover, as in our earlier work, there was a high negative correlation between mean confidence ratings and standard deviations over these six classes of events ($-.83, p < .05$). Thus, in general, there was more agreement among respondents and more confidence in judgments of when events would occur for most important, most happy, and most in love events than for most sad, most afraid, and most traumatic events. This supports the hypothesis that there is a specific time slot for the positive events, in that our respondents agreed more about such events and in general were more confident of their temporal placement of such events than of the negative events included in the study.

Prediction of recall data. If life scripts structure autobiographical memory, we should expect that the distributions of age estimates of the positive events predict the recall data we have obtained in our earlier survey studies on emotionally charged autobiographical memory (Berntsen & Rubin, 2002; Rubin & Berntsen, 2003). The correlation between the age estimates from the present study (presented in Figure 1) and the actual date of a recalled event by respondents in their 60s (from Figure 6 of Rubin & Berntsen, 2003) was calculated over the seven decades of the recall data. The correlations for the three positive events were clear (most important, .96, $p < .001$; most happy, .93, $p < .001$; and most in love, .98, $p < .001$). In contrast, for the negative events, the results
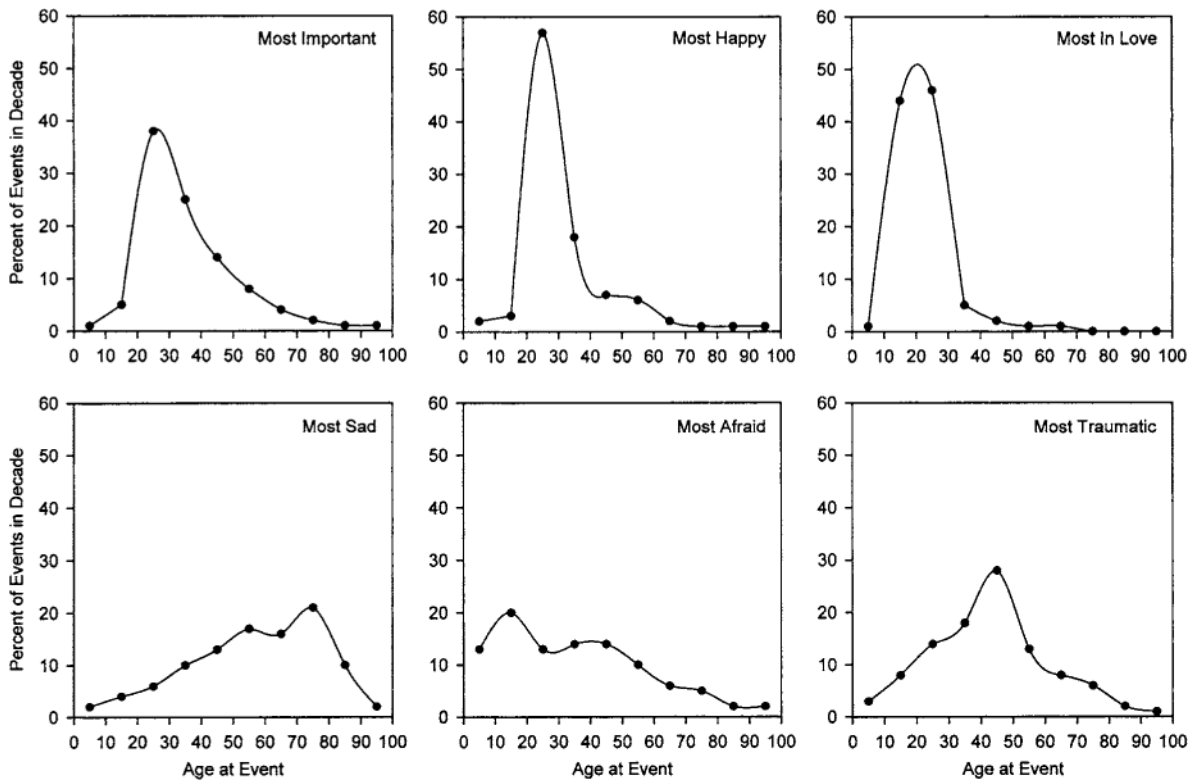
Figure 1. The distribution of age estimates for most important, most happy, most in love, most sad, most afraid, and most traumatic events.

were more mixed (most sad, .97, $p < .001$; most afraid, $-.59$, n.s.; and most traumatic, .01, n.s.). Thus, the present distribution of the age estimates for most afraid and most traumatic events did not predict recall. The high correlation for most sad is somewhat misleading. The recall data fit was from people in their 60s and thus did not show the dramatic drop in the distribution of most sad events that is shown in Figure 1 for the 80s and 90s—a drop not seen in Berntsen and Rubin's (2002) participants of this age.

Gender and age differences. Gender differences in the distribution of the six questions asked were minimal, with only one question showing a mean difference larger than 1 year and only that question showing a statistically significant effect, even with 1,485 respondents. Women expected traumatic events to come 3.02 years later than did men [$F(1,1483) = 10.65$, $p < .01$]. In order to examine possible age or cohort effects, we divided the respondents into six age groups: 20s, 30s, 40s, 50s, 60s, and 70 and older. The rank order of the mean age estimates in the responses to our questions, the standard deviations in the mean age estimates, and the confidence ratings were highly similar within each of the six age groups, with only slight variations. Thus, there were no interactions with the age of the respondents, and the age of the respondents did not confound our basic findings on the estimated ages for events, their variability, or their

confidence. There were, however, three otherwise interesting trends that could indicate age or cohort effects. First, the mean age estimates of the events increased as the age of the respondent increased. Averaging over the six questions for the six decades of the respondents' ages from the 20s to over 70, the mean age estimates of events were 34.60, 34.55, 35.20, 35.90, 38.66, and 39.83 [$F(5,1479) = 13.24$, $p < .0001$]. This finding is consistent with observations of backward telescoping in the dating of personal events (Thompson, Skowronski, Larsen, & Betz, 1996). One effect is to slightly broaden the peaks shown in Figure 1. Second, for the three positive events but not the three negative events, there was a marked increase in the standard deviations with the age of the respondent. Averaging over the positive events, the standard deviations were 9.48, 10.09, 11.31, 12.66, 14.54, and 15.81. Averaging over the negative events, the standard deviations were 19.93, 19.34, 19.56, 20.21, 19.94, and 20.93. Thus, as people get older, they have less agreement as to when positive events should occur, whereas negative events remain uniformly larger. Third, there was a small, but orderly, inverted U-shaped function of confidence in the estimates provided by respondents of different ages. Averaging over the six questions for the six age groups from the 20s to over 70, the mean confidence ratings were 4.54, 5.03, 5.19, 5.26, 5.06, and 5.03 [$F(5,1426) = 10.42$, $p < .0001$].

Summary and Discussion

First, the great majority of the respondents estimated each of the three positive events to take place within a highly circumscribed time period in young adulthood, whereas the age estimates for the three negative events formed much flatter distributions, thus showing considerably less agreement across the respondents. Second, the standard deviations for the age estimates were considerably smaller for the three positive events than for the three negative events, again showing more agreement for the former than for the latter. Third, the confidence ratings of the age estimates were higher for the three positive events than for the three negative events, taken together, although the confidence for the most sad event was close to that for the most important event. Fourth, the confidence ratings of the age estimates correlated negatively with the standard deviations of the age estimates for each event, showing that events associated with higher levels of confidence were more agreed upon across respondents. Fifth, the life span distributions of the age estimates for the most important, most happy, and most in love events correlated highly with the age distributions of the corresponding events recalled in our survey studies of emotionally charged autobiographical memories (Berntsen & Rubin, 2002; Rubin & Berntsen, 2003). A high correlation was also found for data related to the most sad events, but the recall data for the oldest respondents in the previous survey studies could not be accounted for.

In short, the main findings strongly suggest that some shared timetables have guided the age estimates for the three positive events, but not the estimates for the three negative events. People seem to share the expectation that young adulthood is the time for the most positive events to happen, whereas little consensus is found as to when in life highly negative events are expected to take place. The question addressed in Study 2 is whether this data pattern can be explained in terms of an underlying cultural life script for transitional events.

STUDY 2

To gain knowledge on life scripts, we asked people to write down—in the order in which they came to mind—the seven events that they considered to be most important in an average person's life. From our definition and the 10 listed properties of life scripts, we have drawn the following seven hypotheses. Hypotheses 1–6 deal with the content and nature of life scripts. Hypothesis 7 deals with the relation between life scripts and recall from autobiographical memory. (1) A cultural life script has to be shared among people; thus, we expect a high overlap among the events generated by the participants. (2) Because a life script has a temporal structure, we expect a correlation between the order in which events are generated and their estimated dates. (3) Because a life script is distorted to favor positive events, we expect a dominance of events rated as positive. (4) Similarly, because a life script is distorted to favor positive events, we expect more agreement across subjects for the estimated ages for positive events relative to those for negative events. (5) Because a life script refers to an idealized life, the inclusion of events into life scripts is determined by cultural norms, not by real-life prevalence or importance. For that reason, the frequency with which an event is mentioned in our study is not determined simply by the estimates of its real-life prevalence or importance. (6) Similarly, because a life script refers to an idealized life, we expect a dominance of culturally sanctioned transitional events (such as marriage), rather than purely biological events (such as menarche). (7) We assume that an underlying life script has structured the recall pattern in the survey as well as the age norms obtained in Study 1. We therefore expect the majority of positive events to be estimated to occur between the ages of 15 and 30 years, whereas the life span distribution of negative events should be relatively flat or show a slow increase.

Method

Participants. One hundred and three undergraduate psychology majors at the University of Aarhus participated (87 females, 16 males; mean age, 26.4 years; range, 21–51 years).

Procedure. The participants were informed that the study dealt with shared expectations of an ordinary life course within our culture and that they would be asked some questions about a typical life course, including which important events could be expected to take place. It was emphasized that there were no correct or incorrect answers, because we were interested in their intuitions about these questions. The instructions for the study were read aloud and printed on the first page of the questionnaire. In an English translation, they were as follows: "Imagine a quite ordinary infant (choose boy or girl according to your own gender). It cannot be a specific infant that you know, but a prototypical infant in our culture with a quite ordinary life course ahead. Your task is to write down the seven most important events that you imagine are highly likely to take place in this prototypical infant's life. Write the events in the same order as they come to your mind. Give each event a short title that specifies its content." When the participant had recorded seven events, he or she turned to the next page in the booklet and answered the following questions for each of the recorded events: (1) *Prevalence*: How common is the event? Out of 100 people, how many will experience this event at least once during their lives? (number of people out of 100 was estimated). (2) *Importance*: How important is the event? (1 = *unimportant*; 7 = *of greatest importance*). (3) *Age*: At what age is the event expected to take place? (estimated age in years). (4) *Valence*: Is the event emotionally positive or negative (-3 = *very negative*; $+3$ = *very positive*). (5) Will the event involve one or more of these emotions? (the following options were given to compare the results with those of Study 1: happiness, anger, in love, fear, sadness, pride, jealousy, and other). Because the participants tended to endorse more than one emotion for each event, the responses to this question gave no clear pattern.

Results

The recorded events were classified according to 36 categories, which are shown in Table 3. The categories were generated by an independent judge and, for one third of the events, by one of the authors (D.B.). The two judges arrived at the same categories, with the exception of a few low-frequency categories that were not recorded

Table 3
Events Mentioned More Than Three Times and Their Sum of Records, Estimated Life Prevalence,
Importance, Age at Event, and Valence

Event	Records Sum	Prevalence		Importance		Age at Event		Valence	
		M	SD	M	SD	M	SD	M	SD
Having children	93	79.91	12.32	6.70	0.66	28.08	2.45	2.58	0.87
Marriage	77	81.27	13.33	6.17	0.94	26.90	3.11	2.52	0.77
Begin school	68	99.34	1.17	5.69	1.04	6.13	0.42	1.24	1.03
College	56	84.20	11.30	5.67	0.88	22.05	3.86	1.30	0.97
Fall in love	52	94.80	8.82	6.06	1.35	16.33	5.26	2.44	0.89
Others' death	32	97.81	4.69	6.41	0.76	34.35	17.32	−2.56	0.98
Retirement	31	89.97	14.44	5.55	1.06	65.10	2.36	−0.06	0.81
Leave home	26	98.50	2.16	6.12	0.95	19.42	0.95	1.12	0.91
Parents' death	24	97.04	3.64	6.29	0.81	49.09	11.51	−2.46	1.25
First job	22	90.36	7.24	5.41	1.10	25.64	3.06	1.00	0.87
Begin daycare	17	91.88	9.34	5.00	0.94	2.82	1.67	0.29	0.92
Own death	12	100.00	0.00	6.50	1.73	72.42	23.24	−0.92	1.24
Divorce	12	60.42	19.12	5.92	0.90	39.45	8.65	−2.00	1.04
Siblings	12	66.67	16.28	5.75	0.87	3.42	0.90	0.58	1.38
First friend	11	98.64	1.75	6.64	0.92	4.78	2.22	2.91	0.30
Go to school	11	95.73	11.89	6.36	0.67	8.56	4.36	1.18	1.33
Puberty	11	99.55	0.69	6.36	0.92	13.18	1.17	−0.18	0.60
Grandchildren	11	71.64	14.75	5.91	1.22	54.22	5.04	2.73	0.47
Long trip	10	67.50	21.89	5.20	1.32	21.33	2.45	1.30	1.57
Begin walking	9	98.89	0.33	6.67	0.71	1.33	0.50	2.11	1.05
Serious disease	9	69.89	19.34	6.67	0.50	50.63	17.20	−1.33	1.94
Major achievement	8	75.63	13.21	5.38	0.74	25.63	7.82	2.00	1.07
Settle on career	7	77.00	27.07	5.29	1.89	26.67	2.58	0.71	0.95
First sexual experience	7	98.43	1.51	5.71	1.11	16.00	1.41	1.50	1.05
Partner's death	6	69.50	24.79	6.80	0.45	75.00	4.47	−3.00	0.00
Begin talking	6	98.67	0.52	7.00	0.00	2.20	0.45	2.17	0.75
Confirmation	6	75.00	11.83	4.33	1.63	13.67	0.52	2.33	0.82
Enter adulthood	6	94.00	7.87	6.67	0.52	19.40	6.39	1.17	1.72
Having peers	5	72.00	21.68	6.60	0.89	14.20	2.39	2.60	0.55
Empty nest	4	84.25	9.88	5.50	1.00	46.25	2.50	−0.75	0.96
First rejection	4	97.25	4.86	6.50	0.58	7.50	7.78	−3.00	0.00
The "right" job	4	81.25	8.54	6.75	0.50	30.00	0.00	3.00	0.00
First contact	4	96.25	4.79	6.75	0.50	1.00	1.15	1.50	1.73
Baptism	4	77.50	9.57	4.75	1.50	0.00	0.00	1.50	1.29
Earn first money	4	95.00	4.08	5.75	0.96	16.25	4.79	0.75	0.50
Other	40	87.47	17.17	5.97	1.13	20.56	18.96	0.75	2.10

in the sample classified by D.B. Given the open-ended instructions to the participants, the recorded events were surprisingly similar with respect to both content and specificity. The 36 categories were generated to be as close as possible to the participants' own verbal labels, and for this reason four categories can be found for death: own death, death of parent, death of partner, and death of other. Also, the participants distinguished between beginning school and going to school (referring to the first nine grades in Denmark) and between earning one's first money and the first real job. The category *other* consists of events that were recorded by less than four participants and typically includes descriptions of higher order themes. The following four items in the *other* category were mentioned by three people: growing old, loneliness, losing one's job, and work life. The following two items were mentioned by two people: own birth and unhappy love. The remaining 23 items were mentioned by only one person: asking questions about one's own life, being able to reflect, being assaulted, being bullied, being nursed, buying a house, developing mentally and

physically across life, events with one's family, experiencing nature, finding one's path through life, first kiss, following different paths after high school, fulfilling a life's dream, getting settled, happiness, having strong emotions, independence, keep learning in adulthood, menarche, owning a pet, reading, sitting, and standing by oneself.

The great majority of the 36 events and all of the top 10 events in Table 3 can be associated with an educational, work, or family context. This is consistent with the idea that knowledge of role contexts organizes the life script and that the life script tends to include only events that can be associated with culturally important role contexts. The list includes very few events that follow a purely biological timing (such as menarche, menopause, and death), which is consistent with Neugarten's (1968) observation that major punctuation marks in adult life "tend to be more often social than biological" (p. 146). One might assume that the list of events and their frequencies simply reflect what are, in reality, the most common and most important life events in a western cul-

ture. For this explanation to be valid, we should expect a large overlap between the rank order in Table 3 and similar rank orders based on estimated real-life prevalence and importance, respectively. However, when the list of events presented in Table 3 was rank ordered according to real-life prevalence, the top 10 events were own death, enter puberty, begin school, begin walking, begin talking, first friend, leave home, first sexual experience, others' death, and first rejection. Thus, only two of the top 10 events in Table 3 (begin school and leave home) are among the 10 most prevalent events. Similarly, only one of the top 10 events in Table 3 (having children) is among the top 10 events when the list is rank ordered according to importance: begin talking, partner's death, first social contact, the "right" job, having children, begin walking, serious disease, enter adulthood, first friend, and having peers. In short, the frequency by which the events were recorded was shaped by criteria other than estimations of real-life prevalence and importance.

One possible factor might have been a preference for positive events, as is indicated by the following observations. First, the mean ratings of seven out of the top 10 events were positive. Second, considerably higher standard deviations were associated with the means of the age estimates for events rated as clearly negative relative to age estimates for neutral and positive events. If one reads down the Standard Deviation column of the Age at Event measure in Table 3, one finds that each time a large value is found, it is for a negative value in the valence measure. The correlation between mean valence ratings and the standard deviations for the age estimates [$r(35) = -.58$, $p < .0001$] was consistent with an underlying life script favoring positive events over negative ones. Another possible factor for the frequency by which events were recorded seems to be a preference for events occurring in the period of the bump; the means of the estimated ages for six of the top 10 events in Table 3 occurred between the ages of 15 and 30 years.

To clarify this question, a multiple regression analysis (using each of the 721 events listed as an observation) was conducted, with number of people who included the event as one of their seven events as the dependent variable, and five independent variables: prevalence, importance, age at event, valence, and whether the event was temporally located to the bump period. Only valence and bump period were significant predictors [$\beta = .34$, $t(657) = 8.71$, $p < .0001$, and $\beta = .29$, $t(657) = 7.94$, $p < .0001$, respectively]. Prevalence, importance, and age at event were not significant (βs = .03, .03, and .06, respectively). When 102 dummy-coded variables were included to control for subject variance, βs for valence, bump period, and importance were .41, $p < 0001$; .26, $p < .0001$; and .09, $p < .05$, respectively. Prevalence and age at event were not significant (βs = .02 and .04, respectively). Although importance was a significant predictor in this analysis, it accounted for much less of the variance than did valence and bump period (including importance in this analysis added only .005 to the R^2).

Although the participants were asked for important events consistent with the notion of life script, ratings of importance varied to the same extent as did ratings of valence. The means of the standard deviations shown in Table 3 were the same for importance and valence (Ms = .93)

A similar pattern was found when scores for positive events (>0 on the valence scale) were compared with scores for negative events (<0 on the valence scale). Positive events were recorded more frequently [Ms = 51.20 vs. 18.88; $t(568) = 10.45$, $p < .0001$], a greater proportion of positive events was located in the bump period [Ms = .67 vs. 17; $t(525) = 9.82$, $p < .0001$], and positive events were rated younger [Ms = 20.51 vs. 44.00; $t(525) = 14.62$, $p < .0001$]. Positive events were not rated as more prevalent ($p > .3$) or more important ($p > .7$) than negative events. Likewise, events estimated to occur in the bump period were recorded more frequently overall [Ms = 55.68 vs. 29.38; $t(667) = 11.92$, $p < .0001$], were rated as *less* prevalent [Ms = 84.95 vs. 90.79; $t(666) = 5.15$, $p < .0001$], were considerably more positive [Ms = 1.83 vs. 0.39; $t(665) = 11.12$, $p < .0001$], and were slightly more important [Ms = 6.13 vs. 5.91; $t(664) = 2.62$, $p < .01$] than events estimated to occur outside the bump period. The general overweighting of events from the age range of 15–30 years and the dominance of positive events in general and with respect to the bump period in particular is illustrated by Figure 2, a histogram of the 721 events, sorted by positive, neutral, and negative valence.

To the extent that our data reflect an underlying life script, we should expect recall to be serial and chronological. In other words, we should expect a correlation within each participant between the order in which the events were recalled and the temporal order of the events, so that events expected to occur earlier in the life span
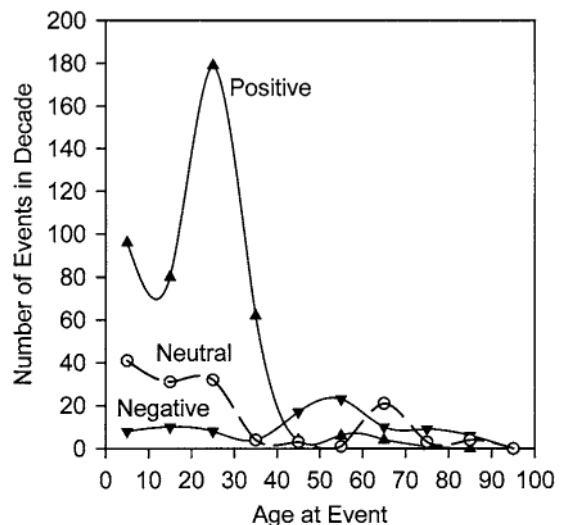

Figure 2. The distribution of age estimates for positive, negative, and neutral events.

were recorded earlier than events estimated to occur at later points in life. Rank-order correlations between age at event and order of recording were calculated within each participant. The mean Spearman correlation coefficient across the 103 participants was 0.55 [$t(102) = 11.09, p < .0001$], ranging from $-.86$ to 1.0. Eighteen of the 103 individual correlations were negative, and 85 were positive [$\chi^2(1) = 43.58, p < .0001$].

Summary and Discussion

The findings confirmed our hypotheses. (1) We found a high overlap among the events generated by the participants, supporting the assumption of a shared cognitive structure. (2) We found a correlation between the order in which events were generated and their estimated dates, consistent with life scripts having a temporal structure. (3) We found a dominance of positive events, consistent with the assumption of an idealized version of life. (4) The age estimates for negative events had higher standard deviations than age estimates for positive and neutral events, consistent with the assumption that negative events have more poorly specified temporal slots than the positive events. (5) The frequency by which events were recorded was predicted strongly by valence and by whether the event fell during the period of the bump, but only weakly by estimated importance and not at all by real-life prevalence, consistent with an idealized version of life. (6) We found a dominance of culturally sanctioned transitional events (such as marriage), rather than purely biological events (such as menarche), consistent with the claim that mainly culturally sanctioned transitional events go into the life script. (7) The majority of positive events were estimated to occur between the ages of 15 and 30 years, whereas the life span distribution of negative events was relatively flat, consistent with our findings from Study 1 and the recall data reported by Berntsen and Rubin (2002) and Rubin and Berntsen (2003).

In sum, when asked to generate events that would fit into a prototypical individual life, the participants appear to have used a shared cultural life script that tends to focus on positive events and events occurring in youth at the expense of other important and prevalent life events. This should not be taken to mean that the data yield a completely unreliable picture of how life is lived. It may very well be that many of the age norms are correct. For example, consistent with the mean age estimates in Table 3, in Denmark almost all children start elementary school at around the age of 6 years, and most people retire at around the age of 65 years. This is in agreement with Neugarten et al. (1965), who argued that "norms and actual occurrences are closely related" (p. 711). What is distorted is the selection of events—that is, the inclusion of only some common and important events that happen to fit the conventions (mostly positive events) and the exclusion of other common and important events that do not (mostly negative events). Another possible distortion is the valence ratings. Because culturally expected transitional events are generally considered positive if they happen on time, the valence ratings for such events may reflect this con-

vention more than how these events are actually experienced by each individual in his or her personal life. For example, the first day of school was rated as clearly positive across the participants, whereas it can be speculated that for many children this change in their lives may not have been experienced as unequivocally positively when it took place (see also Robinson, 1992). Similarly, the frequency by which an event was recorded can be regarded as a measure of its accessibility (Tulving, 1967) or availability, and people consider highly available events as more "normal" than less available events (Kahneman & Miller, 1986; Tversky & Kahneman, 1974). If this observation applies here, our participants may have rated the recorded events as more prevalent than is the case in real life.

GENERAL DISCUSSION

We have presented three classes of evidence for our notion of life script and its relevance to findings about the bump. First, our reanalysis of studies on age norms showed (1) more agreement on age norms for transitional events, (2) that more transitional events were expected to occur in the period covered by the bump than outside this period, (3) more agreement on age norms for transitional events that are expected to occur in the period of the bump than outside of this period, and (4) more agreement on age norms for positive than for negative events. Second, in Study 1, shared cultural age norms were found for important and emotionally positive events, but not for emotionally negative events. The respondents predicted that important and positive events would happen in young adulthood, whereas little consensus was found with respect to the three negative events. In contrast to the three negative events, the age estimates for important and emotionally positive events correlated highly with the data obtained in previous studies of recall from autobiographical memory in similar populations. Third, Study 2 presented direct evidence for the presence of a shared life script for transitional events that is biased to favor positive events and events expected to occur in the period of the bump. In agreement with our findings from Study 1 and the recall data reported by Berntsen and Rubin (2002) and Rubin and Berntsen (2003), the majority of positive events were estimated to occur between the ages of 15 and 30 years, whereas the distribution of negative events was relatively flat.

In short, we have found evidence for the existence of a life script as a shared cognitive structure, and we have found a high correlation between the life course pattern predicted by life scripts and the distribution of autobiographical memories retrieved in response to requests for emotionally charged autobiographical memories. The fact that the two distributions are highly correlated need not mean that one (the life script) has caused the other (the distribution of autobiographical memories). The high correlation could be caused by a common underlying factor. What would be a reasonable candidate for such an underlying factor? The only possible candidate

we can think of would be the way important and emotionally charged experiences are distributed across the life span in real life. According to this alternative account, because memories deal with life and because life scripts give a realistic picture of life, the recall and the script distributions are highly correlated. However, this explanation is contradicted by several facts. First, many important and common events (e.g., accidents, menarche, menopause, assaults, or losing a job) were not mentioned (or were mentioned by only one or two persons) in Study 2. Second, ratings of real-life prevalence were unrelated to how frequently an event was recorded in Study 2, and importance was very weakly related, whereas pleasantness and whether the event was expected to occur in the bump were strongly significant predictors. Third, as was mentioned earlier, the dominance of positive events in the bump period is not found when people are asked to retrieve memories in response to cue words within specified time periods (Jansari & Parkin, 1996) and across the whole life span (Rubin & Schulkind, 1997b), which is contrary to what we should expect if the life script data and the memory distributions reported by Berntsen and Rubin (2002) and Rubin and Berntsen (2003) simply reflect how life is lived. Fourth, the dominance of positive events in the bump period and negative events expected to come later in life is also contrary to studies on the development of affect across the life span, which have shown that older adults have lower scores on measures of both frequency and intensity of negative affect. Thus, contrary to common sense ideas, negative affect is reported and observed less often in older adults than in younger adults. Positive affect is associated with more mixed results; according to some studies its prevalence increases with age, whereas in other studies it remains stable across life (see Charles, Reynolds, & Gatz, 2001; de Vries, Blando, Southard, & Bubeck, 2001; and Mroczek, 2001, for reviews). Given that a reference to real life is unable to provide a satisfactory explanation of the high correlation between the life script and the autobiographical memory distributions reported by Berntsen and Rubin (2002) and Rubin and Berntsen (2003), we will assume that life scripts have structured the recall data. This assumption is also supported by the fact that many transitional events are found among memories occurring in the bump period when people are asked to tell their life narratives (Fromholt & Larsen, 1992) and to report their most vivid memories (Cohen & Faulkner, 1988; but see Fitzgerald, 1988). Cross-cultural studies on the relation between life scripts and autobiographical memories would be an obvious strategy to further establish the validity of the life script account of the bump. The notion of life script and how it structures retrieval deserves investigation independent of the bump. An example would be studies measuring the influence of life scripts on the tendency to confuse foils with previously presented events.

In addition to providing search descriptions for retrieval, life scripts almost inevitably increase the elaboration and rehearsal of personal events that match the life script relative to events that do not. First, life scripts help to endow personal events with "consequentiality" (Brown & Kulik, 1977). As has been mentioned by Shum (1998), one common critique of Brown and Kulik's conception of flashbulb memories is that "individuals usually do not know at the time of encoding that an event will be of importance or of consequence to them later" (Shum, 1998, p. 425). Although this may be true for many everyday events, it is not true for personal events that match the life script. Such events come with a consequentiality and importance that is culturally agreed upon and are therefore likely to be better encoded than events that do not. Second, personal events that fit into slots in the life script are often maintained via external records, such as photographs and video records, which protect the event against forgetting and provide cues for subsequent rehearsal. Third, personal events that match the life script are often shared and rehearsed in social settings. This is unlike strongly schema-deviant events, such as traumas, that generally have to be censored from conversations (Harber & Pennebaker, 1992). Fourth, life script events are generally associated with role transitions and are therefore associated with many first experiences of the kind regarded as important for the organization of autobiographical memory (Robinson, 1992; Shum, 1998). Fifth, most life script events cause a significant role change and thus an important change in the person's social identity (e.g., referring to oneself as a mother, married, or retired; Turner, 1982). Sixth, several life script events are assumed to be experiences that happen only once in a lifetime, which is likely to endow these events with intense emotions at encoding. For all of these reasons, it is highly likely that personal experiences that fit the life script are better encoded and more rehearsed than events that do not.

Although life scripts may influence the encoding and maintenance of personal memories in many ways and thus may be able to also account for the bump in retrieval processes that are unlikely to be structured by a life script (such as word-cued memories or other procedures that use random associative cues), they seem to do so to a much smaller extent. First, in studies in which random cues were used, approximately half of the memories were from the most recent decade, which is contrary to the life script examined here. Second, very few studies that used words to cue retrieval across the life span have examined the emotional valence of the memories, and those that did failed to show more positive memories in the bump (Jansari & Parkin, 1996; Rubin & Schulkind, 1997b). More research on retrieval across the life span is needed to establish to what extent the dissociation between positive and negative emotion in the bump is replicated with types of cuing other than the emotion cues used by Berntsen and Rubin (2002) and Rubin and Berntsen (2003). For now, we will restrict ourselves to arguing that life scripts can account for the bump observed in studies in which people have been asked to recall their most vivid memories (Cohen & Faulkner, 1988; Fitzgerald, 1988), to recall their most important memories

(Rubin & Schulkind, 1997b), and to tell their life stories (Fromholt & Larsen, 1991, 1992; Robinson & Taylor, 1998). In addition, life scripts can account for the dissociation between positive and negative memories in the bump when participants are asked for memories with extreme emotions (Berntsen & Rubin, 2002; Rubin & Berntsen, 2003). It therefore provides a more complete account of the bump than do previous theories, which fail to account for the latter finding.

Broader Implications

Although some theorists of autobiographical memory and proponents of the self-narrative view have mentioned the importance of culturally expected events (e.g., Bluck & Habermas, 2000; Cohen & Faulkner, 1988; Fitzgerald, 1988; Fromholt & Larsen, 1992; Robinson, 1992; Robinson & Taylor, 1998), none has clarified the specific content of such norms or the cognitive structures by which they work. The life script account therefore challenges most accounts of how autobiographical memory structures recall across the life span. Most such accounts are unnecessarily individualistic, we argue (see also Wallach & Wallach, 1983), because they assume that the central structures for the organization of autobiographical memory are derived from the personal life of each individual and not from the way the life course is normatively described by the culture to which this individual belongs. One example is the self-memory system account (Conway & Pleydell-Pearce, 2000), according to which the goal structure of the "working self" (p. 265) determines the accessibility of autobiographical memories. These goals are described as control processes in working memory forming "interconnected goal hierarchies that function to constrain cognition, and ultimately behavior, into effective ways of operating on the world" (p. 265). Given this definition, one should expect the goal structure to be accommodated to the cultural context of the individual—notably, the culturally structured timing of important role transitions. However, nowhere in their otherwise comprehensive review of the literature do Conway and Pleydell-Pearce refer to culturally shared representations of expected transitional events and their timing. The influence of culture is also largely overlooked in Shum's (1998) personal landmark account of autobiographical memory across the life span. He has argued that personal involvement and personal importance determine which events become landmarks in autobiographical memory of the life course, but, ironically, his examples of landmarks—"one goes to school, graduates, gets a job, gets married, has children and so on" (p. 427)—are all culturally sanctioned events (e.g., Neugarten et al., 1965).

Although not acknowledged by memory theorists, descriptions of what is assumed to be basic structures of autobiographical memory are strikingly similar to the way time is observed to be organized culturally, according to the sociological and anthropological literature (see Fry, 1990, for an overview). First, transitions from one role or status to another take place in distinct role contexts, of which the most frequently mentioned ones are family and work (e.g., Fry, 1983). Each role context has prescriptive timetables for when major transitions are expected to take place, according to cultural norms. Second, although they are thematically distinct, these timetables are temporally overlapping: "When applying a timetable analysis to adulthood, we must realize that people operate on a number of timetables simultaneously. Status change occurs in different role contexts (i.e., family and work) creating multiple timetables which interact" (Fry, 1983, p. 286). Similarly, theorists of autobiographical memory have argued that the autobiographical memory is a hierarchical structure with thematic timelines constituting the superordinate level of the hierarchy under which more specific parts of the autobiography are nested (Barsalou, 1988; Conway, 1992, 1996; Conway & Pleydell-Pearce, 2000; Conway & Rubin, 1993; see Neisser, 1986, for a different description of a nested structure). Thematic timelines are temporally overlapping but thematically distinct. Frequent examples are thematic timelines for work and relationship (for graphic illustrations, see Barsalou, 1988, p. 219, and Conway & Pleydell-Pearce, 2000, p. 265). Obviously, these descriptions agree very well with sociological observations (e.g., Fry, 1983). Instead of regarding thematic timelines with nested events as structures inherent to autobiographical memory, it may therefore make more sense to regard them as a part of the socially shared knowledge of the way life is structured in our particular culture (a type of semantic knowledge). When this knowledge becomes superimposed upon our personal experiences, it provides a structure for narrating about our lives that is generally agreed upon within a certain culture.

To sum up, the life course of a newborn is not a tabula rasa. From birth, it is already furnished with a series of culturally important transitional events that are expected to occur in a specific order and at highly circumscribed periods during the individual's life. We have called such highly structured expectations *life scripts*. We have demonstrated that life scripts exist as shared cognitive structures and have shown that they favor positive events over negative and events from youth over events from other ages, consistent with findings about the bump. We have argued that life scripts structure retrieval by providing search descriptions for when one is most likely to have experienced certain classes of events, and for this reason events that fit into the life script are more easily recalled than events that do not. Life scripts are likely to also influence encoding and retention by endowing events that match the life script with an importance and consequentiality that is socially agreed upon and by providing a shared background for rehearsing such events in social settings. Life scripts provide a default structure for understanding and remembering personal life that until now has been largely overlooked in research on autobiographical memory.

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