

Cultural Life Script Theory and the Reminiscence Bump: A Reanalysis of Seven Studies
across Cultures

Alejandra Zaragoza Scherman

Center on Autobiographical Memory Research – CON AMORE, Aarhus University

This is an Author's Accepted Manuscript of an article published in Nordic Psychology, 65, 103-119,
available online at: <http://www.tandfonline.com/10.1080/19012276.2013.807667>.

Changes resulting from the publishing process, such as peer review, editing, corrections, structural
formatting, and other quality control mechanisms may not be reflected in this document. Changes may
have been made to this work since it was submitted for publication.

Acknowledgments

The Danish National Research Foundation supported this research project, grant number: DNRF93. Thanks to Dr. Dorthe Berntsen for her comments on an earlier version of the manuscript.

Abstract

When asked to recall memories from their personal lives in response to word cues, adults older than 40 years report a significantly greater amount of memories from the time when they were 15-30 years old. This phenomenon is called the reminiscence bump. Cultural life story theory is a cultural explanation of the reminiscence bump. According to this account, the reminiscence bump is heavily influenced by the cultural life script — that is shared expectations about the order and timing of life events in an ordinary life course. Life scripts locate a high proportion of major transitional life events in the second and third decade of life. The main purpose of this article is to review the empirical evidence and validity for the cultural life script theory. First, I will describe the reminiscence bump and briefly mention the theories that attempt to explain why it occurs. Second, I will describe the cultural life script theory and how the theory is related to autobiographical memories via life story events. Third, I will describe the methodology that has been used to test the cultural life script theory. Finally, I will provide a reanalysis of seven studies, based on the cultural life script theory and conducted in four countries: Denmark, the United States, Turkey, and the Netherlands. As a part of this reanalysis I will examine the degree to which cultural life scripts guide recall of autobiographical memories by comparing the temporal distribution of life events obtained from the cultural life script (the cultural life script bump) and personal life story events (the reminiscence bump). Results of this re-analysis show that all life scripts across cultures have a life-span distribution resembling the reminiscence bump. Furthermore, the distribution of the events of the life script generated by a group of old Danes in one of the studies resembles the distribution of their own life story events, suggesting that they used the information contained in the life script to retrieve personal memories.

Keywords: cultural life script, life story events, reminiscence bump, autobiographical

memory

Cultural Life Script Theory and the Reminiscence Bump: A Reanalysis of Seven Studies across Cultures

Species have evolved to be born, reproduce, and die, in this exact order. For humans, a lot more other than reproduction is expected to happen between birth and death. Exactly *what* happens, *when*, and *in which order* seems to vary across cultures. According to Berntsen and Rubin (2004), such information is contained in the life script. The life script is semantic knowledge about culturally prescribed, shared expectations regarding the order and timing of life events in a prototypical life course. The cultural life script contains a series of life events, such as "getting married" and "having children", and when these events are expected to take place during the life course. Therefore each event is associated with a particular age, as anthropological and sociological research on age norms (Settersten & Hagestad, 1996) and life events (Brim & Ryff, 1980) has suggested. This results in a series of timed and ordered events that represent an idealized life within a particular culture and transmit expectations about how a life should be lived. In summary, the cultural life script prescribes what transitional life events are important, when, and in what order they are expected to happen. According to Berntsen and Rubin (2004; see also Berntsen & Rubin, 2002 and Rubin & Berntsen, 2003), life scripts are pertinent to autobiographical memory research because they may account for the phenomenon known as the *reminiscence bump* and they help organize autobiographical memory of emotionally charged events.

The Reminiscence Bump

The reminiscence bump is one of the most robust findings in the autobiographical memory literature. When retrieving personal memories in response to word cues, adults older than 40 years reported a significantly greater amount of personal memories coming from the time period between their 15-30 years of age (Rubin, Wetzler, & Nebes, 1986; Rubin,

Rahhal, & Poon, 1998). Developed by Galton (1883) and later revived by Crovitz and Schiffman (1974), the word-cue method consists of showing a participant a word and asking him or her to recall a personal memory related to that word. After that, the participant is requested to provide a description of the recalled event along with an approximate date of when the event happened. Finally, the participant may be asked to rate the memory on vividness and detail. During the 1970's and 1980's, Crovitz and Schiffman (1974); Franklin and Holding (1977); Zola-Morgan, Cohen, and Squire (1983); Fitzgerald and Lawrence (1984) used the cue-word method to investigate personal memories. Rubin et al. (1986) reanalyzed data from these studies and their own studies. They found that most memories could be traced back to the second and third decade of the individuals' lives. This bump has been consistently observed under a variety of methods and samples employed by several research teams (Conway & Rubin, 1993) in studies such as the ones conducted by Jansari and Parkin (1996); Rubin and Schulkind (1997); Conway and Haque (1999); Janssen, Chessa, and Murre (2005); and Kawasaky, Janssen, and Inoue (2011), to mention a few.

Most methods investigating the distribution of personal memories require participants to either date the memory or indicate how old they were when the recalled event happened. Such data result in a histogram like the one in Figure 1 where the x-axis shows the age at encoding and the y-axis shows the number of memories in each age interval. This figure illustrates the three components of autobiographical memory across the life span: childhood amnesia, the reminiscence bump, and retention (Rubin et al., 1986).

----- Figure 1 -----

The period of the reminiscence bump represents the life-span distribution of personal memories during adolescence and early adulthood. This bump suggests that people remember a substantially higher number of events that occurred during these years. The bump has also been observed when participants recall the name of celebrities (Janssen, Rubin, & Conway, 2012); important public events (Janssen, Murre, & Meeter, 2008), and autobiographical memories (Elnick, Margrett, Fitzgerald & Labouvie-Vief, 1999). Further investigation has shown one exception. The reminiscence bump does not show when participants are asked to retrieve emotionally negative memories, a point to which I return later (Berntsen & Rubin, 2002; Rubin & Berntsen, 2003; Haque & Hasking, 2010).

Several theories explaining the reminiscence bump exist: The *cognitive theories* propose that the novelty of transitional events that occur in the second and third decades of life is the main contributing factor to enhanced memory of this life time period (Pillemer, 2001). The *identity formation and narrative theories* establish that events occurring during adolescence and early adulthood are crucial to the development of one's identity. During this time, individuals spend a great amount of time engaged in activities and relationships that will determine who they will eventually become, and also, how they narrate their life stories (Conway & Pleydell-Pearce, 2000). The *cognitive abilities theory* suggests that humans may simply become better equipped to learn, process information, and remember information as they enter adolescence and early adulthood due to brain maturation resulting in optimal cognitive and neurological functioning (Janssen & Murre, 2008). The *cultural life script theory* claims that people recall more events from the second and third decade of life due to the cultural prescriptions and expectations contained in the life script (Berntsen and Rubin, 2004; see also Berntsen & Rubin, 2002 and Rubin & Berntsen, 2003).

These explanations are not mutually exclusive and they make important claims. However, only the cultural life script theory has directly explained the fact that a request for

emotionally negative events does not show the reminiscence bump. This is a relevant contribution to autobiographical memory research because it establishes the importance of emotionality of memories and the influence of cultural variables on cognitive structures. The remaining of this paper will review the empirical evidence for the cultural life script theory.

Cultural Life Script Theory & Life Story Events

Cultural life script theory is an explanation for the reminiscence bump that is not centered on mechanisms within the individual, but on cultural expectations about the human life course. Berntsen and Rubin (2002) asked 1,241 participants to recall their happiest, saddest, most important, most traumatic, and most recent involuntary memories. Results showed a bump only for the happiest and most important memories. In a similar study, they asked 1,307 participants to recall how old they were when they had felt most afraid, most proud, most jealous, most in love, and most angry. As in their previous study, a bump was only obtained for the positive memories (Rubin & Berntsen, 2003). Therefore, based on this empirical evidence, they proposed the cultural life script theory. In this theory, it is hypothesized that the reminiscence bump is “governed by cultural shared representations of the prototypical life cycle that locate the majority of transitional events in young adulthood” (Rubin & Berntsen, 2003, p. 2).

According to Berntsen and Rubin (2004), cultural life scripts structure recall of autobiographical memories of negative and positive emotional events. The life script contains a significant higher proportion of positive important transitional events; as a result, it favors the retrieval of positive emotional memories due to the fact that it presents an idealized version of life (Berntsen & Rubin, 2002; Rubin & Berntsen, 2003). Positive events are normative, expected to occur, more encouraged by friends and family, and easily located during the reminiscence bump. Furthermore, the expectedness and cultural significance of these transitional events make them more rehearsed and more memorable.

Other researchers have also found a bump for positive events in late adolescence and early adulthood, but not for negative events: Collins, Pillemer, Ivcevic, and Gooze (2007) asked participants to mention one positive and one negative event and to indicate what period of the life course they belonged to. They found a bump for positive events (or milestones) that appear in the cultural life script.

Dickson, Pillemer, and Bruehl (2011) asked young adults to identify the most positive and most negative events of a person who is 70 years old and is looking back at his or her life. Participants were also asked to estimate when the events occurred in the imaginary person's life. In the same study, they also asked old adults to look back in their life and remember the most positive and most negative event from their personal past and date these memories. Participants in both the old and the young group showed a bump for positive events or "landmarks", which were also contained in the life script.

Leist, Ferring and Filipp (2010) provided participants with a list of 15 positive and 31 negative events and asked them to supplement this list with two more events of personal significance. Afterwards, the participants indicated whether or not they had experienced the event and at what age they had experienced it. Results showed that all positive events were located within the bump period and that the number of negative events increased with age.

Thomsen, Pillemer, and Ivcevic (2011) asked adult participants to divide their life into chapters and identify what years of their life each chapter covered, choose the most positive and most negative chapters, and then recall an important event from both the positive and the negative chapters. Their results showed a bump for positive events during late adolescence and early adulthood.

Further evidence to the cultural life script theory has been provided by Bohn and Berntsen (2011) when they showed that a reminiscence bump can also be obtained for future life stories as narrated by children, suggesting that the bump results from cultural

expectations and not only from enhanced encoding or memory processes and identity development during adolescence and early adulthood.

Life stories are narratives of autobiographical memories. Therefore, an interest in life stories by autobiographical memory researchers seems only natural. Life stories have been researched extensively (see McAdams, 2001 for a review). From this research we know that for centuries humans have enjoyed telling stories, and particularly stories about their own lives. Given that human lives are so eventful, it is worthy to investigate what life events become a part of people's life stories and how they are related to life events in the life script. According to cultural life script theory (Berntsen & Rubin, 2004), the life script may assist people in recalling their own lives and in telling their life stories. In this way, the life script may function as a template for recalling important autobiographical memories and for telling life stories. Therefore, it is expected that a proportion of life story events will match events in the life script.

In this paper, I attempt to provide evidence for the cultural life script theory by conducting a reanalysis of seven studies that test the cultural life script theory. The objective is to find out exactly in what proportion life story events overlap with the life script. I do this by comparing the life-span distribution of life story events with the life-span distribution of life script events. I will describe such reanalysis further in a later section.

Research on the Cultural Life Script & Personal Life Story Events

In order to test their theory, Berntsen and Rubin (2004) developed the *cultural life script events questionnaire*; it is a task designed to generate cultural life scripts. In this task, a participant is asked to imagine an ordinary girl or boy (according to the participant's own gender) within his or her culture; and write down the seven most important events that this imaginary child is most likely to experience in his or her life from birth to death. Once the participant has generated the seven events, he or she is asked to provide information about

the event in terms of (1) prevalence (how many people out of one hundred will experience the event), (2) importance (how important the event is), (3) age (at what age this event is expected to take place), and (4) emotional valence (whether the event is emotionally neutral, negative, or positive). Then, the researchers code the events generated by the participant in order to create meaningful event categories. A category is created only when it has been mentioned by at least 4% of the participants in the sample. Events that do not fulfill the 4% requirement are grouped in the category “Other”.

A second task related to the life script questionnaire is the *personal life story events questionnaire*. This questionnaire is designed to elicit autobiographical memories. This questionnaire is similar to the cultural life script events questionnaire: While in the cultural life script events questionnaire the participants have to imagine a typical infant; in the personal life story questionnaire, participants have to imagine themselves telling their life story to a new friend. Subsequently, participants are prompted to write a list of the seven most important events of their life. Participants are also asked to rate these seven personal life events in terms of (1) prevalence, (2) importance, (3) age at the event, and (4) emotional valence. Then, the researchers code the events generated by the participant in order to create meaningful event categories. A category is created only when it has been mentioned by at least 4% of the participants in the sample. Events that do not fulfill the 4% requirement are grouped in the category “Other”.

It is important to know that the cultural life script and the personal life story tasks are different both conceptually and empirically. In the life script task, participants generate events from semantic knowledge about what they know is most likely to happen in the typical life course within their culture. In contrast, in the life story task, participants generate autobiographical memories from their own past (see a discussion on these two concepts in Berntsen & Rubin, 2002).

This procedure generates data that can be subsequently analyzed to create a life script and a collection of life story events. Furthermore, this data can also be analyzed in terms of the life-span distribution of neutral, negative, and positive events (from the cultural life script questionnaire) and memories (from the personal life story questionnaire). According to the cultural life script theory, both sets of data will show a bump in the adolescence and early adulthood years, which would result in a *cultural life script bump* (containing cultural life script events) and a *reminiscence bump* (containing personal memories from the life story events) that resemble each other and overlap to a certain degree. If this occurs, then it can be shown that the cultural life script theory is a valid explanation of the reminiscence bump, since a similar bump can also be observed in the life-span distribution of cultural life script events.

One approach to obtain empirical evidence for the cultural life script theory has been to conduct research to generate life scripts, and collect life stories from several cultures: Can an overlap between life stories and life scripts be found in samples from different countries and to what extent? It is predicted that participants from all countries will nominate a significant number of life story events that appear in the life script from their country.

A Reanalysis of Seven Studies on Cultural Life Script Theory across Cultures

In order to answer the question above and provide such evidence, I conducted a reanalysis of life script and life story events data from different cultures. I based my reanalysis on studies on cultural life scripts conducted in Denmark (Berntsen & Rubin, 2004; Rubin, Berntsen, & Hutson, 2009; Bohn, 2010), the United States (Rubin et al., 2009), Turkey (Erdoğan, Baran, Avlar, Taş, & Tekcan, 2008), and the Netherlands (Janssen & Rubin, 2011). These studies employed the questionnaires and the procedure described in the section above. Minor procedural modifications were implemented in the following studies: Rubin et al., (2009) asked participants to code the events themselves, based on the existing

categories from Berntsen and Rubin (2004). Bohn (2010) used the existing valence ratings from Berntsen and Rubin (2004) to rate the emotionality and she did not ask participants to rate events' importance. Erdoğan et al. (2008) investigated whether the age or the gender of the imagined infant had a significant effect. For that purpose, they created "own gender-opposite gender" conditions and "new born-elderly" conditions. In this reanalysis, I only describe the results from the "own gender, new born" condition. Janssen and Rubin (2011) conducted their study online and they also asked the participants to code the events themselves using a drop-down menu of the existing categories from the Danish, American, and Turkish life scripts.

The objective of this reanalysis is to determine the degree to which the cultural life script provides a template for the recall of personal memories. The methodology consisted of a four-step process: First of all, I compiled and examined the cultural life scripts generated by each of the seven studies (see Table 1); second, I plotted the life-span distribution of the cultural life script events from all seven studies, based on emotional valence: neutral, negative, and positive (see Figure 2); third, I examined the four studies that had collected life story events in Denmark (Bohn, 2010; Rubin et al., 2009) and the United States (Rubin et al., 2009); and fourth, I plotted the life-span distribution of life script events and life story events based on emotional valence: neutral, negative and positive, obtained from the group of older adults from Bohn (2010) (see Figure 3). Bohn's sample of old participants was the only one for which both life-span distributions could be generated; the young Danish participants in Bohn (2010) and the American and Danish participants in Rubin et al. (2009) were too young to generate sufficient life story events throughout the life span for a meaningful analysis. The remaining three studies did not collect life story events.

Life Scripts Events.

As mentioned previously, Table 1 shows a compilation of the life scripts that were generated across all studies. Most of the life events contained in the life scripts can be associated with education, work, and family. The three most popular events are: having children, getting married, and beginning school.

---- Table 1 -----

As detailed in the individual studies, researchers strived to maintain categories as close as possible to what participants had actually mentioned; as a result, the compilation in Table 1 contains 66 event categories. These categories were generated separately in each study. Therefore, some life events can be found in different forms across studies, for example, the life event “death” was mentioned as: “parent’s death”, “own death”, “other’s death”, “grandparent’s death”, “partner’s death”, “death of a friend”. Similarly, “high school” appears also as “beginning high school”, “finishing high school”, and “graduating from high school”.

Taken together these life script studies, conducted in four different countries, surveyed a total of 1172 participants (967 females; mean age: 32.85 years, age range: 16-88) who generated a total of 8049 life script events.

A closer inspection of Table 1 shows that the life script event categories are arranged in the second column, in descending order according to the percentage that appears on the last column, which corresponds to the total sample of participants that mentioned them across studies. For example, the category “having children” was mentioned by 76.28% of all 1172 participants in the seven studies. The category “other” is placed at the bottom of the list.

Each of the consecutive columns represents one of the seven life scripts obtained in the studies mentioned above. The number of participants in each study (between 72 and 595) and the resulting number of categories (between 25 and 38) can be found in the top cells along with the names of the authors and the publication year of the corresponding study. The percentage of participants who mentioned a category in each study has been placed on the column cell if the life script event was mentioned. For example, having children was mentioned by 90% of the 103 Danish participants in Berntsen and Rubin (2004). Empty cells indicate categories that either did not satisfy the 4% criteria or were not mentioned at all in each study. This arrangement makes it easy to compare scripted life events between studies and the percentage of participants that mentioned them. Also, it enables the reader to see what events are common and what events are unique across all life scripts. Finally, the last two columns are the total of existing life scripts that contain that event category (for example, “having children”, “getting married”, and “beginning school” were mentioned in all seven studies while “meeting spouse” was mentioned in only one study) and as mentioned earlier, the total percentage of participants who mentioned an event in all studies combined.

It is important to note that the calculations in the last column are the percentage of the participants who mentioned the event in the studies in which the event became a life script category (or events that were mentioned by 4% or more of the participants within each study). For example, “having peers” became a life script category only in three studies; it was mentioned by 5%, 6% and 6% of the samples in Berntsen and Rubin (2004), Rubin et al. (2009), and Janssen and Rubin (2009) respectively. Taken together, this represents 3.92% of the total sample (1172 participants) from all studies. Therefore, the figure might lead to an underestimation of how many mentions a particular event received in total across studies because events that did not satisfy the cut off of 4% mentions are not part of the life script and therefore, are not reported in the studies consistently. “Having peers” might have been

mentioned in the other four studies by less than 4% of the sample in which case it was coded as “other” or might not have been mentioned at all.

In the same manner, across all studies 764 events were coded as “other” because they did not meet the criteria of 4% of mentions within each study. Recoding these 764 other unscripted events using all 66 categories might lead to creating new categories or the existing ones could increase in count. However, this is outside the scope of the present work. It could also be interesting to investigate the content of these “unscripted life script events” in a similar manner as Umanath (see this issue) did with life story events coded as “other” from Rubin et al., (2009). However, the objective of this paper is to compare the events that are included in the cultural life script categories across countries, that is the “scripted” events.

As shown, only twelve event categories were common to all seven studies: “having children” (76.28% of the participants mentioned this event across all studies), “marriage” (64.16%), “begin school” (62.29%), “fall in love” (37.63%), “college” (32.34%), “parents’ death” (31.06%), “first job” (29.27%), “retirement” (17.58%), “own death” (15.96%), “begin walking” (13.23%), “puberty” (11.86%), and “begin daycare” (10.84%). The fact that only one-fifth of all events were common across all studies indicates that there was a larger degree of agreement within studies than across studies.

As predicted by the cultural life script theory, most categories contained in the life scripts are rated as emotionally positive events: Across studies, event valence ratings resulted in 56% to 81% events rated as positive, 17% to 37% as negative, and 0% to 9% as neutral. Events located in the reminiscence period ranged from 33% to 46%.

Figure 2 shows the life-span distribution of positive, negative, and neutral events in the life script in Denmark (Berntsen & Rubin, 2004; Bohn, 2010; Rubin et al., 2009), the United States (Rubin et al., 2009), Turkey (Erdoğan et al., 2008) and the Netherlands (Janssen & Rubin, 2011). Note that data from the old group and young group in Bohn (2010)

have been condensed in one panel since no major differences were observed between the life scripts generated by these groups.

Across all studies shown in Figure 2, at least three results are very robust and can be easily appreciated: (1) just as in the life-span distribution of memories, the distribution of the cultural life script events shows a bump of positive events in the period of 15 to 30 years of age; (2) all life scripts contain a greater proportion of positive life events, indicating that, across cultures, we mainly expect good things to happen in life; and (3) negative and neutral events are randomly located throughout the life span.

----- Figure 2 -----

In summary, the life-span distribution of life script events (or *the cultural life script bump*) reveals a bump that resembles the reminiscence bump obtained in previous studies (Berntsen & Rubin, 2002; Rubin & Berntsen, 2003; Rubin & Schulkind, 1997; Rubin et al., 1986). The fact that the distributions of the life script events and the life story events share a bump that spans between 15 and 30 years of age suggests that the cultural life script theory is a valid explanation of the reminiscence bump.

Life Story Events.

Out of the seven studies on life scripts, only the studies by Rubin et al. (2009) and Bohn (2010) collected life story events using the life story questionnaire described earlier.

Participants in Study 1 and Study 2 in Rubin et al. (2009) were young American and Danish undergraduates with a mean age of 18.7 and 26.4 years, respectively. Only 46% of

life story events from the American participants matched the American life script while 70% of the Danish life story events matched the Danish life script.

Participants in Bohn (2010) were young and old Danes with a mean age of 25.2 and 69.2, respectively. Life story events for the young group matched in 66% to those of the Danish life script, while this was the case for 74% of life story events in the old group. Such differentials might have resulted because participants in the young samples were too young to have lived many of the events contained in the reminiscence bump. Therefore, the lower number of life stories matching the life scripts could be expected. For instance, it can be observed that the older the sample, the greater the overlap between the life script and the life stories. The top five scripted life story events that were mentioned most frequently by the young samples of American and Danish participants were: “college”, “long trip”, “other’s death”, “beginning school”, and “falling in love”. The top five scripted life story events for the old sample of Danish participants were: “having children”, “marriage”, “college”, “parents’ death”, and “partner’s death”.

In all four samples in Rubin et al. (2009) and Bohn (2010), we have seen that life scripts events overlap with life story events to some extent. Consequently, these researchers attempted to compare the life-span distribution of life script events with the life-span distribution of life stories to investigate to what degree life script guides recall of personal memories. However, young participants have not lived long enough for their personal memories to form a reminiscence bump. Therefore, such a comparison is only meaningful for the data of the old participants in Bohn (2010).

The cultural life script bump and the reminiscence bump: life-span distribution of the cultural life script events and the personal life story events.

Figure 3 shows the life-span distribution of cultural life script events and personal life story events based on their emotional valence: neutral, negative and positive for the old

group in Bohn (2010). The upper panel is the life script events and the lower panel is the life story events. The figure provides some support for the claim that life scripts provide a template for the recall of autobiographical memories.

---- Figure 3 -----

As it can be seen, the distributions resemble each other: There is a higher proportion of positive events, and most of them are located during early adolescence and early adulthood, exhibiting a bump. Also, the distribution of negative and neutral events is relatively flat and it is distributed along the life span. The reminiscence bump resembles the cultural life script bump except for the first ten years when there are less autobiographical memories in early infancy compared to the expectations of events in the same period of life. This could be easily explained because memories from life events expected to occur early in life in the Danish life script are likely to have been forgotten later in life due to childhood amnesia (Bohn, 2010). Furthermore, Bohn (2010) reported that 74.3% of the life stories from the old group overlapped with the life script generated by the same participants. Such degree of overlap is high and it suggests that life scripts function like a template for the recall of autobiographical memories. In this figure we can also observe that the life story contains more negative events compared to the life script; which is also expected taking into account that some of the participants lived the German occupation of Denmark during World War II and that life scripts are vastly populated by positive events. In life script events, negative events are unexpected and do not correlated with any particular age. As a result, negative

events are distributed throughout the life span in both distributions and they do not match each other.

In summary, these results demonstrate, as suggested by Berntsen and Rubin (2004; see also Berntsen & Rubin, 2002; Rubin & Berntsen, 2003), that cultural life scripts structure recall of autobiographical memories of positive and negative emotional events (aiding recall of the former; decreasing retention of the latter). Such preference for positive emotional events occurs due to the fact that they are heavily contained within the life script as transitional important events. Moreover, these events are expected to occur, they are normative (and therefore, more rehearsed), and they are easily located during the reminiscence bump period. An alternative explanation is that the resemblance between the life script and the life story events stems from life as actually experienced. That is, that the life script is the result of an accurate picture of life: therefore, life story events will simply resemble such picture. However, it is unlikely that late adolescence and early adulthood are absent of negative events or that positive events occur mainly during this time in life. Some research investigating positive and negative affect through the life span have found that older adults report lowers on measures of negative affectivity (see Charles, Reynolds, & Gatz, 2001, for a review). Therefore, the cultural life script theory claim is a valid one: The resemblance between the distribution of life script and the life story events indicates that the life script helps people with recalling their own lives. As a result, those events contained in the life script, reflecting an idealized version of life, will appear heavily in life stories.

Conclusion

Cultural life script theory uses the notion of *life scripts* — cultural expectations about the timing and order of major transitional life events in an average person's life, to provide a cultural explanation of the reminiscence bump. Cultural life scripts have been generated in Denmark (Berntsen and Rubin, 2004; Rubin et al., 2009 and Bohn, 2010), in Turkey

(Erdoğan et al., 2008), the Netherlands (Janssen and Rubin, 2011), and the United States (Rubin et al., 2009). In all countries, the events that were mentioned the most were marriage, having children, and going to school or college. Furthermore, all life scripts contained a significantly higher proportion of positive events located during the second and third decades of life, creating a cultural life script bump that can be compared to the reminiscence bump obtained from life story memories. Of particular interest is the sample of old adults in Bohn (2010) where a direct comparison of the life-span distribution of life script and life stories events results in correspondence of 74.3% between both distributions. This reanalysis provides further validation of the cultural life script theory. In conclusion, life scripts may account for the reminiscence bump and they help organize autobiographical memory of emotionally charged events.

References

- Berntsen, D., & Rubin, D. C. (2002). Emotionally Charged Autobiographical Memories Across the Life Span: The Recall of Happy, Sad, Traumatic, and Involuntary Memories. *Psychology & Aging, 17*(4), 636-652.
- Berntsen, D., & Rubin, D. C. (2004). Cultural life scripts structure recall from autobiographical memory. *Memory & Cognition, 32*(3), 427-442.
- Bohn, A. (2010). Generational differences in cultural life scripts and life story memories of younger and older adults. *Applied Cognitive Psychology, 24*(9), 1324-1345. doi: 10.1002/acp.1641
- Brim, O. G., Jr., & Ryff, C. D. (1980). On the properties of life events. In P. B. Baltes & O. G. Brim (Eds.), *Life-Span Development and Behavior* (Vol. 13, pp. 367-388). New York: Academic Press.
- Charles, S. T., Reynolds, C. A., & Gatz, M. (2001). Age-related differences and change in positive and negative affect over 23 years. *Journal of Personality and Social Psychology, 80*(1), 136-151. doi: <http://dx.doi.org/10.1037/0022-3514.80.1.136>
- Collins, K. A., Pillemer, D. B., Ivcevic, Z., & Gooze, R. A. (2007). Cultural scripts guide recall of intensely positive life events. *Memory & Cognition, 35*(4), 651-659.
- Conway, M. A., & Haque, S. (1999). Overshadowing the reminiscence bump: Memories of a struggle for independence. *Journal of Adult Development, 6*(1), 35-44. doi: 10.1023/A:1021672208155
- Conway, M. A., & Pleydell-Pearce, C. W. (2000). The construction of autobiographical memories in the self-memory system. *Psychological Review, 107*(2), 261-288.
- Conway, M. A., & Rubin, D. C. (1993). The structure of autobiographical memory. In A. F. Collins, S. E. Gathercole, M. A. Conway & P. E. Morris (Eds.), *Theories of memory*

(pp. 103-137). Hillsdale, NJ, England: Lawrence Erlbaum Associates, Inc, Hillsdale, NJ.

Crovitz, H. F., & Schiffman, H. (1974). Frequency of episodic memories as a function of their age. *Bulletin of the Psychonomic Society*, 4(5-B), 517-518.

Dickson, R. A., Pillemer, D. B., & Bruehl, E. C. (2011). The reminiscence bump for salient personal memories: is a cultural life script required? *Memory and Cognition*, 39(6), 977-991. doi: 10.3758/s13421-011-0082-3

Elnick, A. B., Margrett, J. A., Fitzgerald, J. M., & Labouvie-Vief, G. (1999). Benchmark memories in adulthood: Central domains and predictors of their frequency. *Journal of Adult Development*, 6(1), 45-59. doi: 10.1037/0022-3514.61.2.226.

Erdoğan, A., Baran, B., Avlar, B., Taş, A. Ç., & Tekcan, A. I. (2008). On the persistence of positive events in life scripts. *Applied Cognitive Psychology*, 22(1), 95-111.

Fitzgerald, J. M., & Lawrence, R. (1984). Autobiographical memory across the life-span. *Journal of Gerontology*, 39(6), 692-698.

Franklin, H. C., & Holding, D. H. (1977). Personal memories at different ages. *The Quarterly Journal of Experimental Psychology*, 29(3), 527-532. doi: 10.1080/14640747708400628

Galton, F. (1883). Psychometric experiments. *Inquiries into human faculty and its development* (pp. 133-146). London, England: Macmillan.

Haque, S., & Hasking, P. A. (2010). Life scripts for emotionally charged autobiographical memories: A cultural explanation of the reminiscence bump. *Memory*, 18(7), 712-729. doi: 10.1080/09658211.2010.506442

Jansari, A., & Parkin, A. J. (1996). Things that go bump in your life: Explaining the reminiscence bump in autobiographical memory. *Psychology and Aging*, 11(1), 85-91. doi: 10.1037/0882-7974.11.1.85

- Janssen, S. M. J., Chessa, A. G., & Murre, J. M. J. (2005). The reminiscence bump in autobiographical memory: Effects of age, gender, education, and culture. *Memory, 13*(6), 658-668. doi: 10.1080/09658210444000322
- Janssen, S. M. J., Murre, J. M. J., & Meeter, M. (2008). Reminiscence bump in memory for public events. *European Journal of Cognitive Psychology, 20*(4), 738-764. doi: 10.1080/09541440701554409
- Janssen, S. M., & Murre, J. M. (2008). Reminiscence bump in autobiographical memory: unexplained by novelty, emotionality, valence, or importance of personal events *Quarterly Journal of Experimental Psychology, 61*(12), 1847-1860. doi: 10.1080/17470210701774242
- Janssen, S. M. J., & Rubin, D. C. (2011). Age effects in cultural life scripts. *Applied Cognitive Psychology, 25*(2), 291-298. doi: 10.1002/acp.1690
- Janssen, S. M., Rubin, D. C., & Conway, M. A. (2012). The reminiscence bump in the temporal distribution of the best football players of all time: Pele, Crujff or Maradona? *The Quarterly Journal of Experimental Psychology 65*(1), 165-178. doi: 10.1080/17470218.2011.606372
- Kawasaki, Y., Janssen, S. M. J., & Inoue, T. (2011). Temporal distribution of autobiographical memory: Uncovering the reminiscence bump in Japanese young and middle-aged adults¹. *Japanese Psychological Research, 53*(1), 86-96. doi: 10.1111/j.1468-5884.2010.00451.x
- Leist, A. K., Ferring, D., & Filipp, S.-H. (2010). Remembering Positive and Negative Life Events. *The Journal of Gerontopsychology and Geriatric Psychiatry, 23*(3), 137-147. doi: 10.1024/1662-9647/a000017

- McAdams, D. P. (2001). The psychology of life stories. *Review of General Psychology*.
Special Issue: Autobiographical memory, 5(2), 100-122.
- Pillemer, David B. (2001). Momentous events and the life story. *Review of General Psychology*, 5(2), 123-134. doi: 10.1037/0022-3514.56.5.669
- Rubin, D. C., & Berntsen, D. (2003). Life scripts help to maintain autobiographical memories of highly positive, but not highly negative, events. *Memory & Cognition*, 31(1), 1-14.
- Rubin, D. C., Berntsen, D., & Hutson, M. (2009). The normative and the personal life: Individual differences in life scripts and life story events among USA and Danish undergraduates. *Memory*, 17(1), 54-68.
- Rubin, D. C., Rahhal, T. A., & Poon, L. W. (1998). Things learned in early adulthood are remembered best. *Memory & Cognition*, 26(1), 3-19.
- Rubin, D. C., & Schulkind, M. D. (1997). The distribution of autobiographical memories across the lifespan. *Memory & Cognition*, 25(6), 859-866. doi: 10.3758/bf03211330
- Rubin, D. C., Wetzler, S. E., & Nebes, R. D. (1986). Autobiographical memory across the lifespan. In D. C. Rubin (Ed.), *Autobiographical memory* (pp. 202-221). New York, NY, US: Cambridge University Press.
- Settersten, R. A., & Hagestad, G. O. (1996). What's the latest? Cultural age deadlines for family transitions. *The Gerontologist*, 36(2), 178-188.
- Thomsen, D. K., Pillemer, D. B., & Ivcevic, Z. (2011). Life story chapters, specific memories and the reminiscence bump. *Memory*, 19(3), 267-279. doi: 10.1080/09658211.2011.558513
- Umanath, S. & Berntsen, D. (In press). Personal life stories: Common deviations from the cultural life script. *Nordic Psychology*.

Zola-Morgan, S., Cohen, N. J., & Squire, L. R. (1983). Recall of remote episodic memory in amnesia. *Neuropsychologia*, 21(5), 487-500. doi: 10.1016/0028-3932(83)90005-2

Figure 1. Distribution of memories throughout the life span.

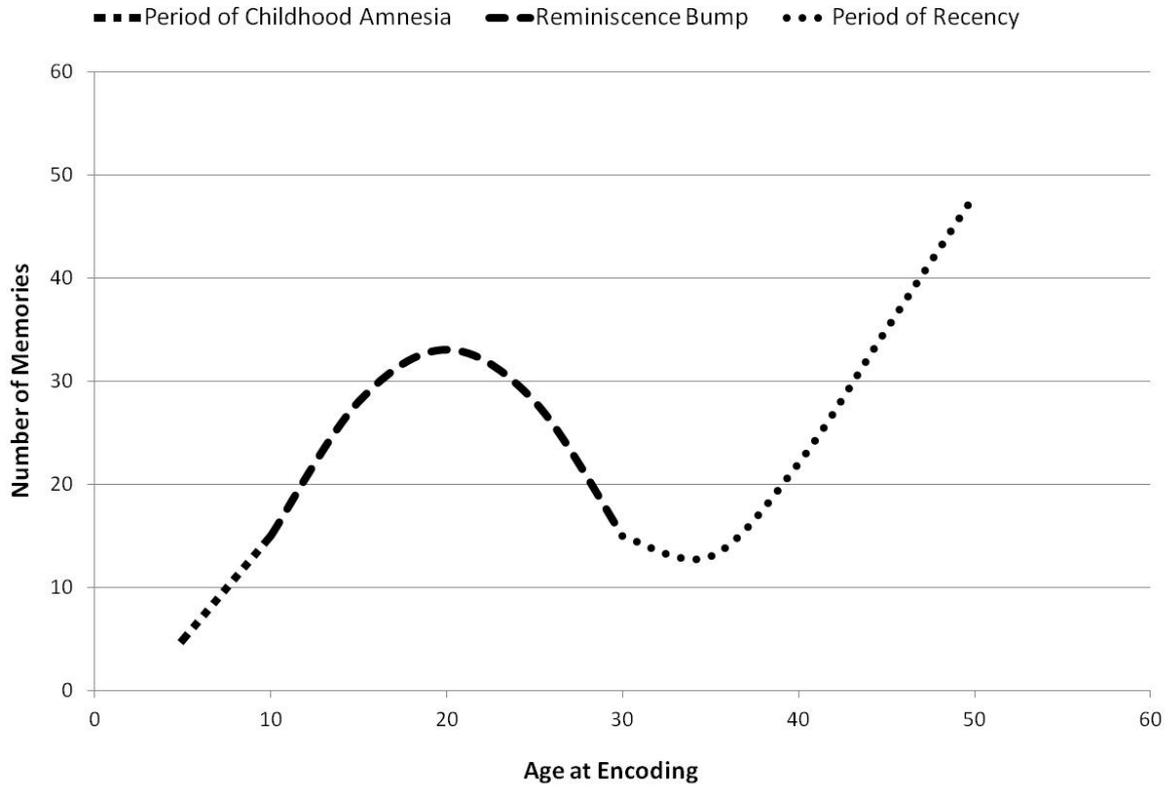


Table 1. Life script event categories generated in the life scripts for Denmark, the Netherlands, Turkey, and the United States and percentage of participants who mentioned each event category per study.

		Danish				Dutch	Turkish	American	Number of studies that share the event	Total
		Berntsen & Rubin (2004)	Rubin et al. (2009) Study 2	Bohn (2010) Young Group	Bohn (2010) Old Group	Janssen & Rubin (2011)	Erdoğan et al. (2008)	Rubin et al. (2009) Study 1		
	N Participants =	103	111	96	72	595	95	100		1172
Event Categories	N Categories =	36	34	33	31	38	27	25		66
	%	%	%	%	%	%	%	%		%
1	Having children	90	89	96	74	72	54	77	7	76,28
2	Getting married	75	74	65	69	53	77	92	7	64,16
3	Beginning school	66	51	78	69	61	76	48	7	62,29
4	Fall in love	50	42	36	15	41	41	14	7	37,63
5	College	54	56	64	67	10	40	54	7	32,34
6	Parents' death	23	32	11	8	44	7	21	7	31,06
7	First job	21	16	24	8	32	45	38	7	29,27
8	Retirement	30	31	51	17	8	11	20	7	17,58
9	Own death	12	14	11	13	17	18	24	7	15,96
10	Leave home	25	19	21		19		8	5	15,87
11	Begin walking	9	4	4	17	15	13	27	7	13,23
12	High school					18		46	2	13,14
13	Puberty	11	12	11	4	13	17	9	7	11,86
14	Begin daycare	17	24	21	28	5	6	5	7	10,84
15	Grandchildren	11	13	20	13	8		13	6	9,90
16	Serious disease	9	8		4	15	5		5	9,73
17	High school graduation			8		17			2	9,13
18	Others' death	31	22	5	8		18	20	6	8,87
19	First sexual experience	7	4	4		13		9	5	8,79
20	Meeting spouse					17			1	8,45
21	College graduation					16			1	8,36
22	Begin talking	6		7	4	6	15	29	6	8,28
23	Long trip	10	13	5	13	9			5	7,68
24	Divorce	12	8		11	9	8		5	7,51
25	Siblings	12	8	8	8	8	6		6	7,51
26	Settle on career	7	17			8		12	4	7,42
27	Own birth			17	17	6		18	4	6,74

		Danish				Dutch	Turkish	American	Number of studies that share the event	Total
		Berntsen & Rubin (2004)	Rubin et al. (2009) Study 2	Bohn (2010) Young Group	Bohn (2010) Old Group	Janssen & Rubin (2011)	Erdoğan et al. (2008)	Rubin et al. (2009) Study 1		
28	The right job	4	20			8			3	6,14
29	Go to school	11	22	5	10			22	5	5,89
30	Grandparents' death					11			1	5,46
31	Partner's death	6	8	7	7	6			5	5,38
32	Confirmation	6	12	20	33				4	5,29
33	First friend	11			4	7			3	4,52
34	Having peers	5	6			6			3	3,92
35	Buying a house					8			1	3,92
36	Moving					7	4		2	3,84
37	Learning to swim or cycle					7			1	3,75
38	Death friend					7			1	3,67
39	First rejection	4	5			5			3	3,24
40	Driver's license					5			1	2,73
41	Baptism	4	5	4	18				4	2,30
42	College's admission exam						26		1	2,13
43	Begin high school			10	8		9		3	2,13
44	Empty nest	4	8	6				4	4	1,96
45	First contact	4	8	4					3	1,45
46	Get a job			7	13				2	1,37
47	Circumcision						16		1	1,28
48	Major achievement	8	5						2	1,11
49	Begin driving							13	1	1,11
50	Enter adulthood	6	5						2	0,94
51	Military service						12		1	0,94
52	Decide on career			9					1	0,77
53	First senior high school				13				1	0,77
54	Finish 9th grade			4	6				2	0,68
55	Accident/Injury						7		1	0,60
56	Getting into fights						7		1	0,60
57	Family quarrels						6		1	0,51
58	High school exam						6		1	0,51
59	Traffic accident						5		1	0,43
60	Parents' divorce				7				1	0,43
61	Special birthdays				7				1	0,43

		Danish		Dutch		Turkish	American	Number of studies that share the event	Total
		Berntsen & Rubin (2004)	Rubin et al. (2009) Study 2	Bohn (2010) Young Group	Bohn (2010) Old Group	Janssen & Rubin (2011)	Erdoğan et al. (2008)		
62	Earn first money	4						1	0,34
63	First kiss						4	1	0,34
64	Continuation school			4				1	0,34
65	Old age			4				1	0,34
66	Other	39	35	30	75	85	29	71	65,19

Figure 2. The life-span distribution of cultural life script events based on their emotional valence: neutral, negative and positive.

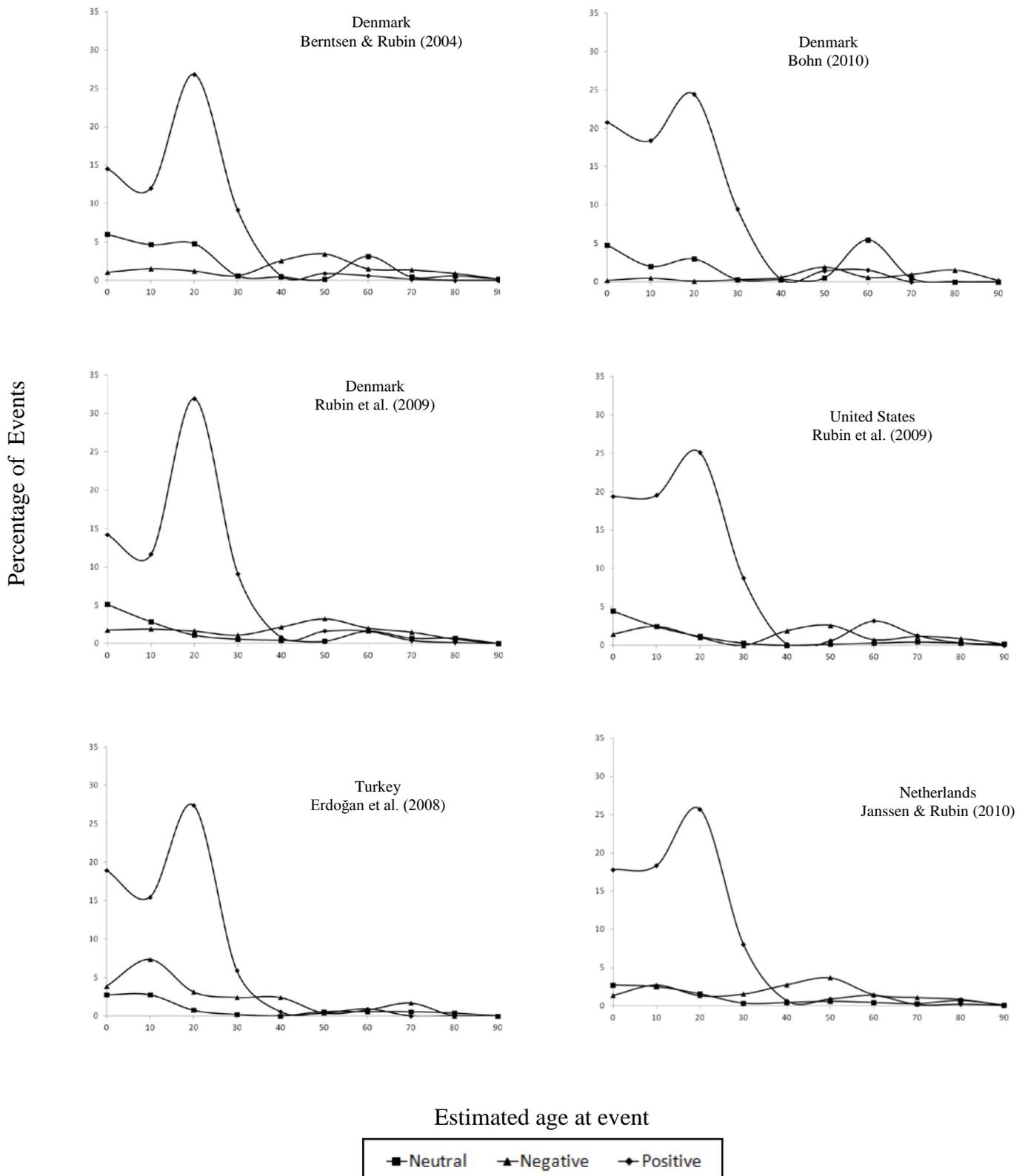


Figure 3. The life-span distribution of cultural life script events (top panel) and personal life story events (bottom panel) based on their emotional valence: neutral, negative and positive for the old group in Bohn (2010).

