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Life happens when you are young: Reminiscence bump in cultural life scripts regardless of method

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Abstract

Cultural life scripts are representations of a prototypical life course within a culture, consisting of a shared understanding of culturally important transitional events and their timing (Berntsen & Rubin, 2004). Cultural life scripts contain a “bump” for events in early adulthood, mirroring the *reminiscence bump* in autobiographical memory (Rubin, Wetzler & Nebes, 1986). However, the bump in the life script might be due to the cultural life scripts methodology of generating only the *seven* most important events in a prototypical life, thus prioritizing early events. Here, we tested whether expanding the number of events would level the bump in the cultural life script. Four groups of 100 participants each generated a cultural life script with four, seven, 15 or 25 events. Across groups, there was a clear bump in early adulthood, showing that the bump in cultural life scripts is highly robust and not an artefact of methodology.

Keywords: cultural life script; reminiscence bump; important memories; autobiographical memory

General Audience Summary

Cultural life scripts are representations of a prototypical life course within a culture, consisting of a shared understanding of culturally important transitional events and their timing. Life scripts have most often been studied by asking participants to imagine a newborn child of their own gender in their own culture; then to list the seven most important life events that they think will happen in this person's life, and to estimate at what ages these events will happen. It has consistently been found that cultural life scripts contain a “bump” for events in early adulthood, that is, people expect most events in a typical life to happen before the early thirties. Incidentally, when asking older people for memories from their lives, people usually have a *reminiscence bump* for memories from their early adulthood. Therefore, it has been proposed that people remember more memories from their early adulthood because they use the cultural life script as a guideline to search for memories. However, the overlap between the bump in the cultural life script and the reminiscence bump in autobiographical memory might simply be due to the fact that participants are usually asked to only come up with the *seven* most important life script events. The bump in cultural life scripts might simply occur because people run out of events to mention before they get beyond the first three decades of life. Here, we tested whether asking participants for more than seven events would level the bump in the cultural life script. Four groups of 100 participants each generated a cultural life script with four, seven, 15 or 25 events. Our results showed that cultural life scripts showed a clear bump in early adulthood, even if participants were asked to come up with 15 or 25 events. Thus, our study showed that people expect life to happen when you are young, regardless of how we asked.

Life happens when you are young: Reminiscence bump in cultural life scripts regardless of method

Our cultural context influences the events we remember and how we understand them (Fivush, Habermas, Waters, & Zaman, 2011; Harris, Paterson, & Kemp, 2008). One way this occurs is via cultural life scripts: culturally shared representations of an idealized life, reflecting semantic knowledge rather than personal experience. Cultural life scripts consist of important transitional events that are expected to happen in a set temporal order in a typical life course (Berntsen & Rubin, 2004; Rubin & Berntsen, 2003). Life scripts have most often been studied by asking participants to imagine a newborn child of their own gender in their own culture; then to list the seven most important life events that they think will happen in this person's life and to estimate at what ages these events will happen (Berntsen & Rubin, 2004). The majority of important events are expected to occur before age 30. The cultural life script contains a clear “bump” (i.e. highest frequency of events) in adolescence and young adulthood, with the peak generally located in the decade from 20-30 years of age. Interestingly, the cultural life script also includes many events from the first decade of life, an effect not seen when asking for memories, as people show amnesia for early childhood experiences (Berntsen & Rubin, 2004). That is, although people forget their own personal events from early childhood, they include these events in the prototypical life script. This distribution of events within the cultural life script has been replicated across different age groups (Bohn, 2010; Bohn & Berntsen, 2008; Janssen & Rubin, 2011; Tekcan, Kaya-Kızılöz, & Odaman, 2012) and in different cultures, despite cultural variations in the specific events mentioned (Clark & Dagey, 2015; Coleman, 2014; Erdogan, Baran, Avlar, Çağlar Taş, & Tekcan, 2008; Habermas, 2007; Haitagblu & Habermas, 2016; Janssen, Uemiya, & Naka, 2014; Ottsen & Berntsen, 2014; Rubin, Berntsen, & Hutson, 2009; Zaragoza Scherman, Saldago, Shao & Berntsen, 2017).

One noteworthy aspect of the cultural life script is its influence on human cognition. Most prominently, there is considerable evidence that cultural life scripts structure recall of important memories. The cultural life script – and its youth bias – provides one of the best-supported explanations of the *reminiscence bump*: the phenomenon that older adults recall more events from youth and early adulthood than from the surrounding years (Rubin, Wetzler & Nebes, 1986). The reminiscence bump for autobiographical memories is very robust, and is found both when asking participants to list important memories (mirroring the methodology of the cultural life script) and when asking participants to generate specific memories in response to cue words (e.g., *book*, *chair*; Janssen, Chessa, & Murre, 2005; Koppel & Berntsen, 2016b; Rubin & Schulkind, 1997). However, asking participants to list important memories leads to a later and more pronounced reminiscence bump than the cue word procedure (Koppel & Berntsen, 2016b; Rubin & Schulkind, 1997; for a review, see Koppel & Berntsen, 2015). Furthermore, illustrating the role of the life script in producing the bump, both the distribution of important memories and their contents have been found to overlap highly with cultural life script events (Berntsen & Bohn, 2010; Bohn, 2010; Collins, Pillemer, Ivcevic, & Gooze, 2007; Glück & Bluck, 2007; Rubin, Berntsen & Hutson, 2009; Koppel & Berntsen, 2016b; Thomsen & Berntsen, 2008). When people are asked to recall important memories from their lives, they tend to generate “life script” events from the reminiscence bump period, likely because they use the cultural life script as a framework to search for such memories (Berntsen & Rubin, 2004; Bohn & Berntsen, 2013).

Despite the substantial literature on the cultural life script and the reminiscence bump, the robustness of the bump in the cultural life script has yet to be tested, due to a lack of methodological variation in most studies to date. That is, the “bump” of events in adolescence and early adulthood in the cultural life script might simply be due to the typically-used instructions to generate the *seven* most important events. Earlier research has shown that, reflecting the nature of scripts in general

(Schank & Abelson, 1977), participants tend to generate life script events in chronological order (Berntsen & Rubin, 2004; Bohn, 2010; Erdogan et al., 2008). Thus, when restricted to only seven events, participants might “run out” of events before reaching the 4th decade of life, leading to an artificial bump rather than reflecting an accurate representation of the expected distribution of important transitional events over the life span.

There is some evidence both for and against this hypothesis. Ece and Gülgöz (2014) instructed Turkish participants to generate a life script, but asked them not to include any of the ten most frequently mentioned events from the Turkish life script (Erdogan et al., 2008). They found that this resulted in a less pronounced bump, with an increase of events between the ages of 16-20 and 31-35 years of age, but not in the core bump years of 21-30. This finding suggests that the bump in the life script is not due to running out of events, as there was an increase in events both directly before and after the bump period. It also suggests that, if individuals are asked to generate cultural life scripts consisting of more than seven events, one might expect to find a more extended bump, as individuals draw upon events from outside the core bump period of the 20-30 decade, but still with a focus on the early part of the life course.

Bohn and Berntsen (2008) asked participants to generate a cultural life script with ten events (slightly more than the typical seven). A reanalysis of these data yielded no evidence that asking for more events changed the location of the bump or produced a smaller bump; rather than citing previously unmentioned events from earlier or later in life as part of this larger life script, participants instead often split previously mentioned life script events expected to occur in adolescence and early adulthood into more finely-grained subcategories. For instance, the event “high school” was split into “starting high school” and “finishing high school” (Bohn & Berntsen, 2013).

Additionally, recent research has found a more general “youth bias”, whereby non-personal events – specifically, important public events – are expected to occur in adolescence and early adulthood (Koppel & Berntsen, 2014, 2016a). For instance, Koppel and Berntsen (2014) asked participants to estimate when the most important public event of a hypothetical person's life would most likely occur. Most participants expected this event to occur in adolescence or early adulthood, with a peak from 11 to 30 years of age, despite the fact that important public events are equally likely to occur at any point across the life span. Although these findings on the youth bias relate to the expected timing of important public events, they suggest that there is a broad focus on adolescence and early adulthood in human cognition. We argue that this focus on the early part of the life course is reflected in cultural life scripts as well, and that the bump in cultural life scripts therefore holds regardless of the number of events requested.

However, to date, no one has collected life scripts consisting of more than ten events. Thus, it has yet to be established whether the preponderance of events from the early part of the life span in cultural life scripts accurately reflects individuals' semantic representations of the distribution of important transitional events in a typical life, or whether this is the result of the limited number of events requested. Here, we tested whether the focus on adolescence and young adulthood in cultural life scripts is an artefact of the instruction to generate only the seven most important events in a prototypical life. We asked four groups of participants to generate the four, seven, 15, or 25 most important events in a hypothetical person's life, and to estimate the age when these events would occur.

Based on the literature reviewed above, we tested the following hypotheses. First, we predicted that participants in all four conditions would produce a bump in adolescence and early adulthood. Second, based on Ece and Gülgöz (2014), we also expected that participants asked to generate more events would mention a higher proportion of events from outside the core bump

period of the 20-30 decade than participants asked to generate fewer events. Lastly, to test whether there was still a clear temporal order to cultural life scripts even as individuals generate more events, or whether asking for more events encouraged participants to work chronologically across the lifespan and then “go back” to childhood as they ran out of events, we tested whether there were differences across conditions in the extent to which participants adhered to chronological order in listing events.

Method

Participants and Procedure

The study was conducted through Amazon's Mechanical Turk website. Four groups of 100 participants each provided four, seven, 15 or 25 life script events, and gave the probable age at occurrence of these events. All participants were based in the United States. Participants were paid varying amounts depending on the number of events requested. Across the groups, they were compensated \$3.20 an hour on average. Participants who did not follow instructions (e.g., reported seven identical events and/or ages) were excluded from the analyses. Therefore, the final numbers of participants per group were 100 (four events), 96 (seven events), 99 (15 events), and 96 (25 events). The four experimental conditions will be called the 4-, 7-, 15- and 25 event condition in the following.

Participants provided their age, gender, ethnicity and educational level. There were no significant differences between the four groups for these demographic variables. Overall, 68.4 % of participants were women, and the mean age was 33.28 (SD = 12.69); 82.9% of participants identified as Caucasian, 6.7 % as Asian, 4.7 % as African American, 1.6% as Hispanic, 0.8% as Pacific Islanders, 0.5 % as Native American, and 2.8% as Other. Education levels were as follows: 34.6 % of participants had a Bachelor's Degree, 18.9% some college, 14.4% a Master's Degree,

10.1 % were currently in college, 9.1% had a high school degree, 6.3% an Associate's degree, 3% an MD or PhD, 1.8% had not finished high school, and 1.8% did not specify their educational level.

The instructions for the cultural life script task followed Berntsen and Rubin (2004) (p. 434), and were as follows: "This study deals with our expectations of an ordinary life course within our culture (i.e., the United States). Your task is to decide which events are expected to take place in a typical life course. You should therefore not think about your own personal life when answering the questions, but a prototypical life. There are no right or wrong answers. We are interested in your intuition about these questions. Imagine a quite ordinary infant of 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 4 (or 7/15/25, depending on condition) most important events that you imagine are most likely to take place in this prototypical infant's life, from birth to death. Write the events in the same order as they come to your mind. Give each event a short title that specifies its content. "

Results

Figure 1 shows the distribution of events across the life span by experimental condition. Confirming our first hypothesis, there was a clear bump in all conditions for events occurring in adolescence and early adulthood.

Participants in all four conditions expected the large majority of important life events to occur within the first three decades of life – even if they could mention 25 events. Confirming our second hypothesis, the fewer events participants were asked to generate, the significantly greater was the proportion of events mentioned to happen between the ages of 21-30 years (41.5 % in the 4-event condition, 33.9% in the 7-event condition, 26.7 % in the 15-event condition, and 21 % in the 25 event condition ; $\chi^2(3)=104.56$; $p < .0001$).

Figure 1: Distribution of cultural life script events across the life span (in decades) by experimental condition

Further, reflecting this greater concentration of events in the core bump years of 21-30 when participants were asked to provide fewer events, Figure 1 also shows that the location of the bump shifted to earlier as participants were asked to provide more events. This finding of a shift in the bump to an earlier age with the increase of events is further supported by differences, across the four conditions, in mean age at event for those events expected to occur in the first 30 years of life ($F(3,3806) = 20.51, p < .0001$). Post hoc tests showed that age at event was significantly lower in the 15- and 25-event conditions than in the 7- and 4-event conditions, and significantly lower in the 7-event condition than in the 4-event condition ($M_{4-event} = 18.80, SD = 9.00$; $M_{7-event} = 16.89, SD = 9.50$; $M_{15-event} = 15.48, SD = 9.37$; $M_{25-event} = 14.89, SD = 8.88$; ps from .015 to $<.0001$). These findings are in direct contrast with the hypothesis that the youth bias in cultural life scripts could be driven by participants running out of events as they list them chronologically.

Lastly, to test whether participants in the four conditions varied in the extent to which they generated events in chronological order, we ranked, individually for each participant, each event according to (1) the position in which it was mentioned in the life script (e.g., the first event mentioned), and (2) the position it occupied in the chronology of events according to their expected age at occurrence (e.g., the earliest event in the life script). We then computed Spearman rank correlations between these two sets of rankings, again individually for each participant. These correlations were uniformly high across all four conditions ($m\rho_{4 \text{ event condition}} = .91, SD = .31; m\rho_{7 \text{ event condition}} = .91, SD = .24; m\rho_{15 \text{ event condition}} = .83, SD = .33; m\rho_{25 \text{ event condition}} = .85, SD = .24$). A one-way ANOVA revealed no significant differences in the correlations across the four conditions ($F(3, 214) = 2.05, p = .11$.¹). That is, participants mostly used chronological order regardless of how many events they were asked to list.

Discussion

This study presents clear evidence for a “bump” in adolescence and early adulthood in the cultural life script, regardless of the number of events participants were asked to generate. This indicates that the bump in cultural life scripts reflects an accurate and robust representation of the expected timing of important transitional events in a typical person's life within one's culture, rather than a methodological artefact of the number of events elicited. Regardless of the number of events they were asked to list, participants expected most important events in the typical person's life to occur in adolescence and early adulthood.

Second, consistent with Ece and Gülgöz (2014), who did not find an increase of cited events in the core bump decade of 20-30 when participants were asked to exclude the ten most frequently

¹ The degrees of freedom are depressed in this analysis because the homogeneity of variance assumption was violated.

mentioned life script events, we found that participants in the 4- and 7-event conditions showed a stronger, steeper bump between the ages of 21-30 years than participants in the 15- and 25-event conditions. As expected, then, as participants were required to cite more events, they drew upon a greater proportion of events from outside the core bump period. However, there was no evidence that this increased the listing of events from the *later* decades of life. Instead, we found that the bump shifted on average to *earlier* as individuals were asked to provide more events, demonstrating the critical finding that participants drew on additional events from childhood rather than later adulthood.

Third, regardless of the number of events requested, participants generally mentioned events in chronological order, that is, even participants in the 15- and 25-event conditions systematically mentioned events from childhood, adolescence and early adulthood, before moving on to later age brackets. Thus, participants held a well-specified, temporally delineated cultural life script of even up to 25 events.

Overall, our results support the notion of a general youth bias, as proposed by Koppel and Berntsen (2014; 2016a), because they illustrate that the bump in cultural life scripts found in earlier studies cannot be due to the small number of events elicited. Rather, our findings show that participants dwell on events expected to happen during the first three decades in life even when asked to provide many events. Our finding that the bump shifted its location to an earlier average age with the increase in the number of events listed fits well with studies showing that the reminiscence bump for memories elicited with cue words is located earlier than the bump elicited with a request for important memories (Koppel & Berntsen, 2015; Rubin & Schulkind, 1997); that is, as more mundane memories are elicited, earlier memories are reported. Participants in the present study were asked for the most important events likely to happen in a newborn's life. As we asked them to list more events – up to 25 events – they likely began to include less important

events, similar to word-cued autobiographical memory studies. However, we did not ask participants to rate the importance of events, so future studies will have to show whether this interpretation of the data is supported. In conclusion, this study provides further evidence that the cultural life script represents a robust, chronologically organized understanding of how a typical life proceeds, representing one way in which culture shapes and guides our autobiographical memories.

Authorship contributions

The three authors conceived and designed the study together, JK collected the data; AB and JK analyzed and interpreted the data, AB wrote the first draft of the manuscript, which JK revised and commented upon, AB revised the second draft, which JK and CBH revised and commented upon. AB wrote the final version of the manuscript which all three authors agreed upon.

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Conflict of Interest Statement

The authors report no conflict of interest.

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