This is an Author's Accepted Manuscript of an article published in Memory,

Published online: 03 Dec 2013, available online at:

<http://www.tandfonline.com/10.1080/09658211.2013.863358>

The Reminiscence Bump in Older Adults' Life Story Transitions

Kristina L. Steiner David B. Pillemer

University of New Hampshire

Dorthe Kirkegaard Thomsen Andrew P. Minigan

University of Aarhus University of New Hampshire

This is an Author's Accepted Manuscript of an article published in Memory,

Published online: 03 Dec 2013, available online

at: <http://www.tandfonline.com/10.1080/09658211.2013.863358>

Abstract

Older adults' memories of events that occurred in adolescence and early adulthood are over-represented compared to other lifetime periods. Prior research on this *reminiscence bump* has focused on qualities of individual memories. The present study used a novel interview method to examine the potential role played by mental representations of extended lifetime periods. Older adults provided oral life stories, and they divided their transcribed narratives into "chapters." Participants' ages at chapter beginnings and endings showed pronounced reminiscence bumps. The results are consistent with the idea that personal episodes occurring near the boundaries of extended lifetime periods receive preferential processing that enhances long-term memory.

Key Words: Autobiographical Memory, Reminiscence Bump, Aging, Event Boundaries, Life Narratives

The Reminiscence Bump in Older Adults' Life Story Transitions

When older adults recount their life stories, at what ages are continuities and discontinuities in the personal narrative especially apparent? Do these salient life transitions co-occur with the well-documented reminiscence bump for specific memories? To address these questions, participants in the present study recounted open-ended oral life stories and then identified “chapters” in their transcribed narratives. This novel method provides a unique test of autobiographical memory properties, which are typically examined using direct probes. This research also expands the current theoretical and empirical emphasis on the qualities of *individual memories* to include the potentially important but often overlooked role played by recollections of extended lifetime periods, here termed *life story chapters*.

When older adults are asked to report specific memories from their personal past, remembered events are over-represented in late adolescence and early adulthood. This reminiscence bump is apparent when adults provide memories in response to word cues (e.g., Rubin & Schulkind, 1997a, 1997b) and when they are prompted to recall memories that are specific (Conway, Wang, Hanyu, & Haque, 2005; Demiray, Gulgoz, & Bluck, 2009), important (Berntsen & Rubin, 2002; Fromholt et al., 2003; Gluck & Bluck, 2007; Webster & Gould, 2007), or vivid (Fitzgerald, 1988). The reminiscence bump is evident across cultures (Conway et al., 2005; Demiray et al., 2009).

A reminiscence bump is more prominent for positive than for negative life events. Berntsen and Rubin (2002, 2004; Rubin & Berntsen, 2003) proposed that a broadly shared cultural life script is composed primarily of prototypically positive events from early adulthood (e.g., marriage, childbirth); the script directs the memory search to these cultural landmarks. In contrast, negative life events (e.g., accidents, deaths) tend to be unexpected or are not tied by convention to a particular age interval. Gluck and Bluck (2007) and Demiray et al. (2009) presented evidence for a life story account in which bump memories are characterized by high levels of novelty, distinctiveness, importance for identity development, and transitional status rather than positive valence per se. Dickson, Pillemer, and Bruehl (2011) discovered that strict adherence to an established life script did not seem to be a uniquely defining quality of bump memories; unexpected events also produced a robust reminiscence bump.

Recent research on extended lifetime periods or life story chapters (Thomsen & Berntsen, 2008; Thomsen, Pillemer, & Ivcevic, 2011) expands theoretical explanations for the bump in specific memories. Conway & Pleydell-Pearce (2000; see also Conway, 2005) proposed that autobiographical memory is organized hierarchically, with extended lifetime periods (e.g., my first year in college) providing an organizing structure for associated specific memories (e.g., saying goodbye to parents). A search for specific memories could begin by activating broader life chapters, which would then cue memories of nested episodes. Consistent with this idea, when adults are asked to provide a list of discrete life chapters, chapter start and end ages produce reminiscence bumps in

late adolescence and early adulthood (Thomsen & Berntsen, 2008), and specific memories tend to cluster at chapter transitions (Thomsen et al., 2011).

Several lines of research and theory support the idea that life transitions provide an organizational structure for recall of specific memories (Brown, Hansen, Lee, Vanderveen, & Conrad, 2012; Pillemer, Goldsmith, Panter, & White, 1988; Pillemer, 1998). Svob and Brown (2012) proposed that the unusually persistent memories of late adolescence and early adulthood mark major shifts in physical and psychological status. From a life story perspective, bump memories may focus on transitional events because of the unique and profound developmental challenges of late adolescence and early adulthood (Demiray et al., 2009). Vivid memories of transitional episodes provide critically important information about changing life circumstances and thereby serve a valuable directive function (Pillemer, 2003). Naturally occurring breaks in the life story may identify transition points where memory for personal episodes should be enhanced.

Recent research on event boundaries (Radvansky, 2012; Swallow, Zacks, & Abrams, 2009; Zacks, Speer, Swallow, Barver, & Reynolds, 2007) is also consistent with the expectation that memories should be overrepresented at life chapter transitions. The continuous flow of lived experience is made more comprehensible by the perception of structural regularities (Kurby & Zacks, 2007). Prior research in this domain has focused on activities that last only seconds or minutes, including boundary-marking shifts in perception, story content during reading, or momentary physical location (Radvansky, 2012; Zacks et al., 2007). Event boundaries appear to have a “privileged status in long-

term memory” (Swallow et al., 2009, p. 237). Boundaries tend to correspond to change points in ongoing activities, which require that current event models be updated with valuable new information (Kurby & Zacks, 2007; Swallow et al., 2009). Memory enhancement may occur partly as a result of increases in mental processing when an event shift is experienced (Radvansky, 2012). The current study extends experimental research on event boundaries to the natural flow of activities contained in people’s personal life stories. Self-identified chapter boundaries identify life transitions that could promote intensive mental processing and enhanced recall.

In prior research on the reminiscence bump, older adults were instructed to describe memories or chapters in serial fashion (e.g. Gluck & Bluck, 2007; Thomsen et al., 2011). Direct probing of individual memories or chapters could bias retrieval towards events that share particular qualities, such as individual or cultural importance, and may not be representative of natural or self-directed remembering. For example, asking older adults to list their “most personally important” life events (Gluck & Bluck, 2007, p. 1930) is likely to result in an over-representation of remembered episodes that meet a culturally shared definition of importance, such as marriage or childbirth. Similarly, when adults are instructed to “imagine that you were to write your life story as a book and then divide it into chapters” (Thomsen & Berntsen, 2008, p. 425)), and to provide a “heading” or “title” for each chapter (Thomsen & Berntsen, 2008, p. 425; Thomsen et al., 2011, p. 271), they may infer that each chapter should be clearly defined and a prominent or meaningful part of a coherent life history. In contrast, older adults in the present study

were asked to tell their life story in any way that they wished. The interviewer offered no guidance as to what types of events or life periods should be described, and participants were unaware that they would be asked to identify chapters in their free-flowing narratives. In a second meeting, they divided their transcribed narrative into self-defined chapters, again with no restrictions or guidelines. They also provided their age at the beginning and ending of each chapter and rated its emotionality and expectedness.

We hypothesized that start and end dates of self-identified life story chapters would cluster in early adolescence and young adulthood. In addition, we expected the reminiscence bump in chapter beginnings and endings to be more prominent for positive than for negative chapters, in accordance with prior research on distributions of positive and negative memories (Berntsen & Rubin, 2002, 2004) and chapters (Thomsen et al., 2011). If an elevated frequency of negative life chapters is evident, it should occur later in the life course (Thomsen et al., 2011). Following the findings of Dickson et al. (2011) for specific memories, we predicted that boundaries of both expected and unexpected chapters would produce bumps.

Method

Participants

Members of an active retirement association responded to an announcement for a psychological study of autobiographical memory. Additional participants were recruited via word of mouth. A total of 34 older adults (15 male) participated in two separate sessions and were paid for their participation. The participants were between the ages of

59 and 92 ($M = 73.06$, $SD = 8.5$). All participants self-identified as Caucasian, and 76% had earned at least an undergraduate college degree.

Procedure

Participants were interviewed individually in either a quiet community room or in their own home. They were instructed that they had 30 minutes in which to tell their life story; a stopwatch displayed how long the interview had been in progress. When participants continued beyond 30 minutes, they were allowed to finish at the natural conclusion of their narrative. Interviews lasted an average of 26.14 minutes ($SD = 10.09$, range: 4.43 to 51.23 minutes). The interviews were tape-recorded. After telling their life story, participants provided their age, gender, education level, and ethnicity.

Approximately one to two weeks later, participants were presented with a verbatim transcript of their life story and were asked to mark where self-defined chapters began and ended, using a procedure adapted from Pillemer, Krensky, Kleinman, Goldsmith, & White (1991). Specific instructions to participants were as follows:

I would like for you to review your life history and divide your narrative into chapters. It is completely up to you to decide what your chapters will consist of; whatever definition you decide to use for a chapter is fine with us. I have a pen, and I would like you to draw two lines in the transcript to indicate the end of a chapter. After you have done that, I would like you to label the chapter with sequential numbers. If you change your mind or make an error, feel free to cross out what you have done. If you find that later information belongs in an earlier

chapter, mark the information with two lines and label it with the chapter number it belongs to. If you have any questions, feel free to ask me for clarification.

Again, how you define chapters is completely up to you, and whatever definition you decide to use is fine.

After numbering their chapters, participants completed a short questionnaire for each chapter. They provided their age at the beginning and end of the chapter or indicated that a chapter was still ongoing. Participants rated how emotionally positive (*1=not at all positive, 5=extremely positive*) and negative (*1=not at all negative, 5=extremely negative*) the chapter was¹. They also rated the chapter's expectedness (*1=highly unexpected, 5=highly expected*) and its impact on self-growth (*1= growth limiting, 5=growth promoting*). Because most chapters were rated as growth promoting, analyses involving this variable are not reported. Participants then completed the 5-item Satisfaction with Life Scale (SWLS; Diener, Emmons, Larsen, & Griffin, 1985). Finally, they rated how difficult they found the task of breaking their life story into chapters (*1=not at all, 5=very*).

Results

Preliminary Analyses

The mean number of chapters participants identified in their life stories was 11.59 (*SD* = 6.14; range = 4 to 26) and the mean length of completed chapters was 8.70 years (*SD* = 9.29; range: < 1 year to 61 years). The mean SWLS score (*M* = 28.18; *SD* = 3.55) corresponded to an overall "satisfied" rating. Parametric and non-parametric correlational

analyses failed to identify statistically significant relationships between participants' current ages and number of chapters, ratings of difficulty of dividing the life story into chapters, total time of the interview, and SWLS scores. Gender comparisons also failed to identify statistically significant differences on these variables. The general pattern of results is similar when the analysis excludes participants with relatively short (less than 20 minutes) and long (greater than 36 minutes) interviews.

Participants' Ages at Chapter Beginnings

The distribution of participants' ages at the beginnings of life chapters ($n = 389$) is presented in Figure 1. The hypothesized reminiscence bump is clearly evident in late adolescence and early adulthood, with 23.1% of all chapters beginning in the 17 to 24 year age interval. Chapter starts are also over-represented at birth (8.9%) and at ages 5 and 6 (5.6%). To examine whether the observed incidence of bump period chapter starts was higher than would be expected by chance, the proportion of all reported chapter starts that occurred between ages 17 and 24 was computed for each individual participant; the mean proportion for the sample was then compared to the expected proportion of chapter starts between ages 17 and 24 corresponding to a uniform distribution across the lifespan. Because the youngest participant was 59 years of age, the uniform distribution was based on chapters beginning in ages 0 to 59. The mean proportion of chapter starts in the 17 to 24 age interval (.23) was significantly higher than the proportion based on a uniform distribution (.13), $t(33) = 4.37, p < .001$. When the analysis focused on chapter starts occurring in a broader range of bump ages (15 to 30

years) used in prior studies (e.g., Gluck & Bluck, 2007; Thomsen et al., 2011), the difference between the mean proportion of chapter starts (.32) and the proportion based on a uniform distribution (.27) approached significance, $t(33) = 1.91, p = .065$. Many life narratives followed the story-telling convention of including a chapter that began at birth, but these historical starting points do not represent personally experienced transitions. When birth year chapter starts were omitted from the analysis, the mean proportion of chapter starts in the 15 to 30 year age interval (.35) was significantly higher than the proportion based on a uniform distribution (.27), $t(33) = 2.78, p = .009$.

[Insert Figure 1 about here]

To examine the distribution of chapter start ages of strongly positive chapters, we identified the subset of chapters for which ratings of positive emotions was either 4 or 5 and ratings of negative emotions was 3 or less ($n = 238$; 61% of chapters); this distribution closely resembled the overall distribution. A similar reminiscence bump was also evident for the relatively few chapters ($n = 43$) that were strongly negative (negative rating of 4 or 5 and positive rating of 3 or less). Chapters rated as expected (4 or 5 on the expectedness scale; $n = 91$) or unexpected (1 or 2 on the expectedness scale; $n = 126$) also produced similar bumps. Only chapters that were rated as neither expected nor unexpected ($n = 172$) failed to produce a clear bump; 50% of chapters began before age 17 and only 15.1% of chapters originated in the 17 to 24 year age interval².

Participants' Ages at Chapter Endings

When providing their age at the end of life chapters, participants had the option to state that the chapter was still ongoing; 28.2% of chapters were identified as ongoing. The distribution of participants' ages at the end of life chapters with ongoing chapters excluded ($n = 280$) is presented in Figure 2. A pronounced reminiscence bump is clearly evident in late adolescence and early adulthood. The mean proportion of chapter endings in the 15 to 30 year bump interval (.46) was significantly higher than the expected proportion based on a uniform distribution (.27), $t(33) = 4.72$, $p < .001$. When participants' current ages were used to represent ongoing chapters (Figure 3), the distribution is bi-modal, with a distinctive reminiscence bump and a second cluster of chapter endings or continuations in the later adult years. Distributions for highly positive chapters, highly negative chapters, expected chapters, unexpected chapters, and chapters that were neither expected nor unexpected were all highly similar to the overall distributions presented in Figure 2 and Figure 3.

[Insert Figure 2 and Figure 3 about here]

Chapter Content

Content analyses of reminiscence bump memories identified in previous studies (Berntsen & Rubin, 2004; Dickson et al., 2011) provided an initial list of possible chapter themes; a close reading of life story chapters generated additional themes. Two researchers coded all chapters beginning in the ages 17 to 24 bump period for the presence or absence of explicitly mentioned themes; chapters could represent multiple

themes. A naïve researcher then coded all chapters; inter-coder agreement for the presence of major themes ranged from 87% to 100%. Common themes included physical moves (50%); college/graduate school (34%); paid employment/career/first job (32%); marriage-related topics (30%); military experience (24%); and pregnancy/childbirth (20%).

Discussion

When older adults provided free-flowing life stories and then divided their narratives into discrete chapters, participants' ages at chapter beginnings and endings revealed prominent reminiscence bumps that mirrored bumps found for specific memories (e.g., Berntsen & Rubin, 2002; Demiray et al., 2009). Bumps were evident for positive, negative, expected, and unexpected chapters. These findings are consistent with prior studies examining lifetime distributions of positive memories (Berntsen & Rubin, 2004) and memories of expected and unexpected events (Dickson et al., 2011). Although the bump for negative chapters was not predicted, it suggests that events occurring at the boundaries of negative as well as positive life periods may draw the focused attention and enhanced mental processing that promotes long-term memory (see Dickson et al., 2011, for evidence of a bump for memories of unexpected negative episodes). Because strongly negative chapters were uncommon, this finding should be replicated in larger and more diverse samples. Most of our participants were Caucasian, well educated, and satisfied with their lives. New studies should include participants with a greater range of positive and negative life experiences and levels of well-being.

Our results support the idea that extended lifetime periods provide an organizing structure for recall of associated specific memories (Thomsen et al., 2011). They also support prior research highlighting the central influence of life transitions on autobiographical memory processes (Brown et al., 2012; Svob & Brown, 2012; Demiray et al., 2009; Pillemer, 1998). Common themes of chapters beginning in the bump period represented major shifts in physical or psychological status: physical moves, marriage, childbirth, military service, attending college or graduate school, and early employment experiences. Speculatively, events occurring during these transitions--near the boundaries of extended lifetime periods--may receive preferential processing that enhances memory (Radvansky, 2012; Swallow et al., 2009; Zacks et al., 2007).

Many events represented in reminiscence bump memories, such as marriage or having a child, are milestones in the conventional life story (Berntsen & Rubin, 2004), but relatively unimportant transitional episodes also may be illuminated in memory. For example, specific episodes occurring near the beginning of college are over-represented in long-term memory (Pillemer et al., 1988; Thomsen & Berntsen, 2005). Most college students vividly remember meeting their college roommate for the first time (Rubin & Kozin, 1984), despite only modest ratings of event emotionality and significance (Talarico, 2009). It is possible that events occurring at the boundaries of life chapters receive sharply focused attention at encoding and subsequent overt and covert rehearsal that promotes memory persistence.

The present study demonstrates that older adults can readily identify chapters in their life stories, and that start and end dates of these chapters produce prominent reminiscence bumps. Theoretical explanations for the reminiscence bump have focused primarily on qualities of specific memories. Our results highlight the potentially critical role played by older adults' memories of extended lifetime periods. They also forge a new conceptual link between autobiographical memory research and experimental studies of event boundaries (e.g., Zacks et al., 2007) and thereby strengthen connections between disparate research approaches to the study of memory.

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 and Aging, 17*, 636–652.
- Berntsen, D., & Rubin, D. C. (2004). Cultural life scripts structure recall from autobiographical memory. *Memory & Cognition, 32*, 427–442.
- Brown, N. R., Hansen, T. G. B., Lee, P. J., Vanderveen, S. A., & Conrad, F. G. (2012). Historically-defined autobiographical periods: Their origins and implications. In Berntsen, D., & Rubin, D. C. (Eds.). *Understanding Autobiographical Memories: Theories and approaches*. Chapter 9.(pp. 160-180). Cambridge University Press.
- Conway, M. A. (2005). Memory and the self. *Journal of Memory and Language, 53*, 594–628.
- Conway, M. A., & Pleydell-Pearce, C. W. (2000). The construction of autobiographical memories in the self-memory system. *Psychological Review, 107*, 261-288.
- Conway, M. A., Wang, Q., Hanyu, K., & Haque, S. (2005). A cross-cultural investigation of autobiographical memory: On the universality and cultural variation of the reminiscence bump. *Journal of Cross-Cultural Psychology, 36*, 739–749.
- Demiray, B., Gülgöz, S., & Bluck, S. (2009). Examining the life story account of the reminiscence bump: Why we remember more from young adulthood. *Memory, 17*, 708–723.

- Dickson, R. A., Pillemer, D.B., & Bruehl, E. C. (2011). The reminiscence bump for salient personal memories: Is a cultural life script required? *Memory & Cognition*, 39, 977-991.
- Diener, E., Emmons, R. A., Larsen, R. J., & Griffin, S. (1985). The Satisfaction with life scale. *Journal of Personality Assessment*, 49, 71-75.
- Fitzgerald, J. M. (1988). Vivid memories and the reminiscence phenomenon: The role of a self narrative. *Human Development*, 31, 261-273.
- Fromholt, P., Mortensen, D. B., Torpdahl, P., Bender, L., Larsen, P., & Rubin, D. C. (2003). Life-narrative and word-cued autobiographical memories in centenarians: Comparisons with 80-year-old control, depressed, and dementia groups. *Memory*, 11(1), 81-88.
- Glück, J., & Bluck, S. (2007). Looking back across the life span: A life story account of the reminiscence bump. *Memory & Cognition*, 35, 1928-1939.
- Kurby, C. A. & Zacks, J. M. (2007). Segmentation in the perception of memory events. *Trends in Cognitive Science*, 12, 72-79.
- Pillemer, D. B. (1998). Momentous events, vivid memories. Cambridge, MA: Harvard University Press.
- Pillemer, D. B. (2003). Directive functions of autobiographical memory: The guiding power of the specific episode. *Memory*, 11, 193-202.
- Pillemer, D. B., Goldsmith, L. R., Panter, A. T., & White, S. H. (1988). Very long-term memories of the first year in college. *Journal of Experimental Psychology:*

Learning, Memory, and Cognition, 14, 709-715.

Pillemer, D. B., Krensky, L., Kleinman, S. N., Goldsmith, L. R., & White, S. H. (1991).

Chapters in narratives: Evidence from oral histories of the first year in college.

Journal of Narrative and Life History, 1, 3-14.

Radvansky, G. A. (2012). Across the event horizon. *Current Directions in Psychological Science*, 21, 269-272.

Rubin, D. C., & Berntsen, D. (2003). Life scripts help to maintain autobiographical memories of highly positive, but not highly negative, events. *Memory & Cognition*, 31, 1-14.

Rubin, D. C., & Kozin, M. (1984). Vivid memories. *Cognition*, 16, 81-95.

Rubin, D. C., & Schulkind, M. D. (1997a). Properties of word cues for autobiographical memory. *Psychological Reports*, 81, 47-50.

Rubin, D. C., & Schulkind, M. D. (1997b). The distribution of autobiographical memories across the lifespan. *Memory & Cognition*, 25, 859-866.

Svob, C., & Brown, N. R. (2012). Intergenerational transmission of the reminiscence bump and biographical conflict knowledge. *Psychological Science*, 23, 1404 – 1409.

Swallow, K. M., Zacks, J. M., & Abrams, R. A. (2009). Event boundaries in perception affect memory encoding and updating. *Journal of Experimental Psychology: General*, 138, 236-257.

Talarico, J. M. (2009). Freshman flashbulbs: Memories of unique and first-time events in

- starting college. *Memory*, 17, 256-265.
- Thomsen, D.K., & Berntsen, D. (2005). The end point effect in autobiographical memory: More than a calendar is needed. *Memory*, 13, 846-861.
- Thomsen, D. K., & Berntsen, D. (2008). The cultural life script and life story chapters contribute to the reminiscence bump. *Memory*, 16, 420–435.
- Thomsen, D. K., Pillemer, D. B., & Ivcevic, Z. (2011). Life story chapters, specific memories and the reminiscence bump. *Memory*, 19, 267–279.
- Webster, J. D., & Gould, O. (2007). Reminiscence and vivid personal memories across adulthood. *International Journal of Aging and Human Development*, 64, 149–170.
- Zacks, J. M., Speer, N. K., Swallow, K. M., Braver, T. S., & Reynolds, J. R. (2007). Event perception: A mind/brain perspective. *Psychological Bulletin*, 133, 273-293.

Footnotes

- ¹ Due to a clerical error, the midpoint of both the positive and negative scales was labeled "neutral." Because our analysis of emotions focused on strongly positive or negative feelings, our results were unaffected.
- ² Detailed statistical analyses for different chapter types (positive, negative, expected, unexpected, neither expected nor unexpected) are available upon request.

Figure 1. Participants' ages at chapter beginnings (presented in 2-year age bins).

Figure 1

Figure 2. Participants' ages at chapter endings with "ongoing" chapters excluded (presented in 2-year age bins).

Figure 2

Figure 3. Participants' ages at chapter endings with "ongoing" chapters included (presented in 2-year age bins).

Figure 3