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A 3.5 year diary study: Remembering and life story importance are predicted by different event characteristics

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Abstract

Forty-five participants described and rated two events each week during their first term at university. After 3.5 years, we examined whether event characteristics rated in the diary predicted remembering, reliving, and life story importance at the follow-up. In addition, we examined whether ratings of life story importance were consistent across a three year interval. Approximately 60% of events were remembered, but only 20% of these were considered above medium importance to life stories. Higher unusualness, rehearsal, and planning predicted whether an event was remembered 3.5 years later. Higher goal-relevance, importance, emotional intensity, and planning predicted life story importance 3.5 years later. There was a moderate correlation between life story importance rated three months after the diary and rated at the 3.5 year follow-up. The results suggest that autobiographical memory and life stories are governed by different mechanisms and that life stories memories are characterized by some degree of stability.

A 3.5 year diary study: Remembering and life story importance are predicted by different event characteristics

Specific memories are representations of “a circumscribed, one-moment-in-time event...including what was seen, heard, thought, and felt” (Pillemer, 1998, p. 3). Thus, specific memories are characterized by a sense of reliving a past event. Some specific memories are retained only for a short time (e.g. breakfast this morning), whereas other specific memories persist for decades (e.g. visiting Empire State building) (e.g. Brewer, 1986; Conway, 2005; Rubin, Schrauf, & Greenberg, 2003). In addition, some specific memories are considered important to life stories, whereas other specific memories may be remembered but not considered important to life stories. Thus, remembering, reliving, and life story importance are considered distinct characteristics of specific memories

Life stories are internalized stories about individuals' lives characterized by temporal, causal, and thematic coherence. They are based on autobiographical memory and used to support identity and self-understanding (Bluck & Habermas, 2000; Bruner, 1990; Conway, Singer & Tagini, 2004; Fitzgerald, 1988; McAdams, 1996; 2001; McLean, Pasupathi & Pals, 2007; Neisser, 1994; Polkinghorne, 1988). Although remembering and life story construction are related processes, they are not the same and hence they may be predicted by different event characteristics. Here, we examine whether processes that are involved in remembering and reliving are different from processes involved in the selection of specific memories as important to life stories.

Thus, we tested whether remembering, reliving, and life story importance of specific memories were predicted by similar or different event characteristics. We examined this by having 45 participants describe two events each week across their first term at university. They rated these events on several event characteristics, like unusualness, goal-relevance, and emotional intensity. After three and a half years, we examined which event characteristics predicted remembering, reliving, and life story importance. We also examined whether life story importance was consistent over time.

Below, we first review literature on the relationship between specific memories and life stories and describe how the self-memory system theory (e.g. Conway, 2005) explains the long-term retention of specific memories and their possible relation to life stories. Second, we review diary studies examining event characteristics associated with long term memories and selection

into life stories. After reporting the results of the present study, we discuss the implications and suggest modifications to the self-memory system theory that follow from our results.

1.0. Autobiographical memory and life stories

Specific memories are a part of autobiographical memory, which refer to “memory for information related to the self” (Brewer, 1986, p. 26). Specific memories refer to events that can be located at a specific time and place in the individual's past. While individuals retain many specific memories from the very recent past, most of these are thought to be forgotten, and only some specific memories are retained for longer periods of time (Conway, 2005; 2009). Recalling specific memories involves episodic memory, which is associated with distinct subjective experiences of remembering, like imagery, reliving of the original event, and a sense of travelling back in time (Brewer, 1986; Conway, 2009; Rubin et al., 2003; Tulving, 2002). We refer to these as reliving qualities.

Life stories are comprised of different types of autobiographical memory. Thus, life stories are constructed based on conceptual autobiographical memory, like facts (e.g. “I was born in Denmark”) and abstracted knowledge about important periods in the individual's past (e.g. “when I lived in Ribe”) (e.g. Brown, Hansen, Lee, Vanderveen, & Conrad, 2012; McAdams, 2001; Thomsen, 2009). In addition, some specific memories are selected to become an important part of life stories. These different types of autobiographical memory are “storied” by autobiographical reasoning, whereby temporal order and causal links between the different parts of life stories and between life stories and selves are constructed (Habermas & Bluck, 2000; McLean et al., 2007; Singer et al., 2013). Thus, specific memories that are important to life stories are connected to other life story material as well as selves. Recently, we have suggested that initial processing of the event may determine whether specific memories are selected as important to life stories and here we provide further support for this idea (Thomsen, Olesen, Schnieber, Jensen & Tønnesvang, 2012).

Life stories are dynamic and dependent on time and social context and individuals may thus have different life stories. Although life stories are dynamic, some specific memories may generally be more likely to be selected as a part of life stories than other specific memories. Some degree of consistency in which specific memories are considered important to life stories may contribute to stability in life stories. Such stability in life stories would seem to be necessary if they are to provide individuals with self-continuity (McAdams et al., 2006). One study

examining the stability of themes, emotional tone, and narrative complexity over a three year time interval also found evidence of some stability of these aspects of life stories (McAdams et al., 2006). In the present study, we further investigated the stability of life stories by examining whether the life story importance of specific memories is stable over time.

Some researchers have suggested that the term autobiographical memory should be reserved for memories that are truly a part of life stories, with the explicitly mentioned implication that the individual retains specific memories that are not autobiographical (Bluck & Habermas, 2000). However, here we take the position that specific autobiographical memories are characterized by reference to an event taking place at a specific time and place as well as certain subjective qualities (e.g. reliving, imagery, and mental time travel), rather than being a part of life stories. We then examine what distinguishes specific memories that become important to life stories from specific memories that do not become important to life stories.

In addressing this question, the self-memory system theory is highly relevant because it relates specific memories to life stories and attempts to explain the long-term retention of specific memories. In this theory, life stories are the top level in a hierarchically organized knowledge system (Conway, 2005; Conway & Jobson, 2012; Conway et al., 2004). According to Conway (2005; Conway & Pleydell-Pearce, 2000), the second, third, and fourth levels in the autobiographical knowledge base include themes, consisting of broadly defined life themes, such as work and relationships; life-time periods, which consist of temporally extended autobiographical memory referring to periods in the individual's life, containing information about the typical places, people, and activities associated with each period; and general events, which are either summarized representation of repeated events (categoric memories) or events referring to short time-intervals (short-term temporally extended memory). At the lowest level of the hierarchical organization are episodic details, such as perceptual-emotional information. Life stories, themes, life time periods, and general events form part of the long-term self (Conway et al., 2004) or conceptual self (Conway, 2005). In addition, the self includes a working self, which consists of a complex set of hierarchically organized active goals (Conway et al., 2004; Conway, 2005; Conway & Jobson, 2012). The working self operates to direct behavior and cognitive processes through for example the selective encoding and consolidation of specific memories (Conway, 2005).

According to the self-memory system theory, the construction of specific memories is based on a combination of the different parts of the self and the episodic memory system, which

contains experience-near information, like summaries of sensory and emotional details (Conway et al., 2004; Conway, 2009). Specific memories from the recent past represent junctures in short-term goal processing, which help the individual keep track of goal-progress, like “submitting the abstract” or “shopping for dinner” (Conway, 2005). According to the theory, such short-term specific memories are “ultimately on a forgetting trajectory and will in fact be forgotten unless they become integrated with other long-term memory representations” (Conway, 2005, p. 596). These long-term memory representations refer to long-term goals and the autobiographical knowledge base: “Only those with an enduring association with current goals are retained and even then must become integrated with knowledge structures in the autobiographical knowledge base if they are to be retained in the long term” (Conway, 2005, p. 613; see also Conway, 2009). Following this, relevance to long-term goals is crucial for the retention of specific memories over the long term, and this was tested in the present study. The selective retention of such specific memories is thought to be adaptive, because it promotes coherence between memory and aspects of the self (Conway, 2005). The theory does not directly address possible differences between specific memories that are important and unimportant to life stories and the results of the present study may thus be relevant to extend the theory to address this issue. One possibility is that relevance to long-term goals is critical to both long-term retention and life story importance of specific memories. That is, some degree of relevance to long-term goals will promote long-term retention of specific memories and with increasing relevance to long-term goals specific memories will also become important to life stories. Goal-relevance may promote processes (e.g. rehearsal) that integrate specific memories with other structures in the autobiographical knowledge base, such as lifetime periods, and increase the temporal and causal connections that characterize specific memories important to life stories.

1.1. Diary studies

Few studies have examined directly whether goal-relevance predicts long-term remembering (but see Brewer, 1988 for two studies with mixed findings). Indirectly supporting the role of goal-relevance, diary studies have generally found that higher emotional intensity and importance are associated with long-term retention of specific memories (Brewer, 1988; Catal & Fitzgerald, 2004; Conway, Collins, Gathercole & Anderson, 1996; Thompson, Skowronski, Larsen & Betz, 1996; Wagenaar, 1986). In addition, more rehearsal (Catal & Fitzgerald, 2004; Linton, 1978 (e.g. repeated testing effect); Thompson et al., 1996) and higher unusualness or

distinctiveness (Brewer, 1988; Catal & Fitzgerald, 2004; Skowronski, Betz, Thompson & Shannon, 1991; Wagenaar, 1986) predicts retention over time. Also, some studies suggest that positive valence is related to higher likelihood of long-term retention (Skowronski et al., 1991; Thompson et al., 1996; Wagenaar, 1986, but see Wagenaar, 1992 for a re-analysis suggesting that self-focused negative memories may be particularly well-remembered). Note that these findings are generally consistent with laboratory studies on episodic remembering, where distinctiveness, emotional intensity, and rehearsal have all been associated with higher likelihood of remembering items (e.g., Greene, 1987; Hunt, 1995; Kensinger, 2009).

Previous diary studies have not distinguished between processes associated with remembering events and processes associated with including events in life stories. In a recent diary study, we directly addressed the role of goal-relevance and other processes in predicting remembering and life story importance of specific memories (Thomsen et al., 2012). Participants described two events each week during their first term at university. They dated each event and rated it on goal-relevance, importance, emotional intensity, rehearsal, unusualness, planning, and emotional valence. Approximately three months after the end of the diary period, the participants were invited to a test session, where they were asked to recall three specific memories from the diary period that were important to their life stories. They were also provided with headings from six randomly selected events from the diary period and asked whether they remembered the event. This last part of the procedure resulted in two types of events: 1) events that were remembered, but that were not important to life stories and 2) events that had been forgotten. All events were rated on a single item of life story importance (on a 1-7 scale with 1 indicating no life story importance and 7 indicating a high degree of life story importance; this item is used to examine consistency of life story importance over time in the present paper). We then compared memories that were important to life stories, memories that were not important to life stories, and forgotten events on characteristics initially rated in the diary. The analyses showed that memories considered important to life stories were initially rated higher on goal-relevance, importance, emotional intensity, and rehearsal compared to memories that were considered unimportant to life stories. Memories that were remembered, but that were unimportant to life stories, were initially rated higher on unusualness and rehearsal compared to memories that were forgotten. These results indicated that unusualness and rehearsal are critical for whether events are remembered over the long term, presumably because higher unusualness and rehearsal prevents memories from becoming a part of generic memory structures and thus “forgotten” as

specific memories. In addition, the results suggest that goal-relevance, emotional intensity, importance, and rehearsal are critical to whether memories become important to life stories, perhaps because life stories are constructed to emphasize the individual as an agent striving to attain certain goals (that may sometimes be blunted by the external world or other people). The construction of life stories includes establishing temporal order and causal links between memories and the self, which would take place during rehearsal (or autobiographical reasoning, Habermas & Bluck, 2000). Rehearsal increase with importance and emotional intensity (e.g. Rubin et al., 2003) and relevance to long-term goal may guide such rehearsal to include links with other specific memories and/or periods relevant to the same goal.

Overall, these results suggest that different processes are involved in determining later remembering and life story importance of specific memories. The different processes involved in remembering and life story importance are not addressed in the self-memory system theory (e.g. Conway, 2005) but is important for understanding remembering, forgetting, and how specific memories are selected into life stories. However, our prior study suffers from some weaknesses. First, the follow-up period was only three months, which is a short period considering that specific memories and life stories span decades. Second, the distinction between life story and non-life story memories was confounded with retrieval process (free recall versus cued recall). Finally, the results were based on only 2-3 memories in each of the three categories (life story, remembered, and forgotten), which reduces reliability.

1.2. The purposes of the present study

In the present study, we sought to remedy the shortcomings of our previous diary study by inviting the same participants to a test session approximately 3.5 years after their diary period. We decided on 3.5 years as a follow-up, because specific memories remembered after such a time period can clearly be considered long-term specific memories. Based on our previous test of the participants (e.g. Thomsen et al., 2012), our first hypothesis was that high unusualness and rehearsal, as rated during the diary, would predict whether memories were remembered at the follow-up. Note that this prediction is at odds with the prediction derived from the self-memory system theory (e.g. Conway, 2005), which seems to suggest that relevance to long-term goals predicts long-term retention and which does not include unusualness/distinctiveness as central for processes involved in long-term retention. To further explore characteristics of specific memories, we also included measures of reliving qualities and tested which event characteristics

would predict these over time. Our second hypothesis was that high goal-relevance, emotional intensity, importance, positive valence, and rehearsal, as rated during the diary period, would predict whether specific memories were rated as important to life stories. Although positive valence was not a predictor of life story importance in our first study (Thomsen et al., 2012), here we expected an effect of positive valence, because the effect of positive valence may become more apparent over time. This is because such a positivity bias likely reflects self-enhancement processes that maintain positive self-schemata (e.g. Sedikides & Gregg, 2008) and older memories are thought to be subject to more schema-based processing (e.g. Brewer, 1986).

In addition, we examined the consistency of life story importance in specific memories over time. We examined consistency of life story importance by comparing ratings of life story importance at the original three months follow-up (Thomsen et al., 2012) with ratings of life story importance at the present 3.5 year follow-up. Since this is one of the first studies on the consistency of life story importance of specific memories, we had no formal hypothesis. But following the study by McAdams and colleagues (2006), we expected some degree of consistency.

Methods

2.0. Overview of the study

The participants were asked to describe and date two events each week during their first term at university (see Figure 1 for an overview of the method). They rated each event on a number of event characteristics. This part of the procedure thus yielded the event characteristics that were used to predict later remembering and life story importance. We chose the first term at university because it is an important and emotional period, which is associated with a number of different goals and concerns, like doing well at studying and initiating new relationships. Previous studies have also shown that specific memories from first term of college are remembered for a very long time and are often emotional (Pillemer, Goldsmith, Panter, & White, 1988). This ensured that the period would contain at least some memories of importance to life stories. Also it is a delimited period that participants may form a mini-narrative about (Robinson, 1992). Note that participants were not aware that their memory for the diary events would later be tested.

Approximately 3.5 years after they completed the study, the participants, most of whom took part in the three months follow-up (Thomsen et al., 2012), were invited to take part in the

present follow-up. At the follow-up test session, they were first asked to tell the segments of their life stories covering their first term. This was done in order to activate conceptual autobiographical memory and specific memories that the participants would include in their internalized life stories, thus ensuring that later assessment of life story importance would be made with respect to this. We then presented participants with all their event descriptions in random order and asked them whether they remembered the event. For all remembered events they were asked to rate importance to life stories and reliving qualities. This part of the procedure yielded the measures of remembering, reliving qualities, and life story importance, that we attempt to predict from the event characteristics rated during the diary period. Below, we describe the participants, material, and procedure in more detail. For the diary part of the study, descriptions from Thomsen et al. (2012) are used, since this part of the procedure and materials are the same for the present study.

2.1. Participants

The participants were 45 students (25 women) from different study programs with a mean age of 25.62 years ($SD = 5.06$). All but two of the 45 participants had participated in the first follow-up of the diary study (e.g. Thomsen et al., 2012). Originally 89 participants were included in the diary part of the study, yielding a drop-out rate of 49%. The 45 participants did not differ from these 89 participants on age ($t(82) = .22, p > .10$) or gender ($\chi^2(1) = .31, p > .10$) (age and gender data on five of the original 89 participants were lost due to experimenter error). We then examined whether participants retained for follow-up differed from participants who dropped out on event characteristics as rated in the diaries. We conducted multiple regressions for each of the event variables, entering participants as dummy variables and a dichotomous variable for participation versus drop-out. The regressions showed that participants who dropped out had higher ratings of importance, but lower rating of goal-relevance and emotional intensity, compared to participants who were retained for follow-up. No other effects of participation versus drop-out were significant. See Thomsen et al. (2012) for further details on recruitment.

2.2. Procedure and materials

Initial session. The participants were telephoned and invited to an individual introduction session with a student assistant. The introduction sessions took place in the three weeks preceding start at university and the study was presented as examining how students

experience their first term at university. The assistant explained that the participant would be required to complete weekly electronic diaries describing and rating two events from the previous week. They were instructed to select the two events that first entered their thoughts, when they thought back upon the previous week. It was explained that the events could be both important and less important, both positive and negative, emotionally intense or more neutral. It was also explained that for some weeks it would be easy to select two events and for other weeks it might seem that there was nothing worth describing, but they should nonetheless select two events for every week in the diary period. The participants then completed a practice version of the weekly diary and any questions from the participants were answered. The participants were informed that the assistant would be their personal contact person during the diary period and the reminder and the book gift procedure was explained. Participants were ensured full confidentiality and it was explained that they could withdraw from the study at any time.

The diary. The diary period started the last week in August and ended the last week in January. Each Monday in this period, the participant was sent an email with links to two electronic questionnaires, one for each of the two events of the previous week. For each event the participant was given the same instruction as they received in the initial session (see Appendix A for verbatim instructions). The questionnaire then contained two blank spaces: One for a self-selected heading for the event and one for a description of the event. The blank space for the description of the event had no range limitations and was headed by the following instruction: "Description of event 1 (or 2): Please include where the event took place, what happened, who was present, your actions, what you thought and felt as well as any other details that you remember". Although the instruction for selecting events was vague in order not to direct participants' recall toward special types of events, inspection of the diary content imply that participants followed the instructions. They were then asked to provide date and month for the event, and finally the participants rated the events on questions 1-7 in Table 1. These questions on event characteristics were inspired by the diary studies reviewed above as well as studies of flashbulb memory (e.g. Bohannon, 1988; Brown & Kulik, 1977; Conway et al., 1994; Pillemer, 1984). They were selected as predictors of remembering and life story importance because previous studies have demonstrated their involvement in remembering (see section 1.1.) and because they operationalize processes theorized to be critical to remembering and life story importance (e.g. Conway, 2005; Schank, 1999; Thomsen et al., 2012).

If the participant had not responded to the questionnaire by Tuesday, she/he was first reminded on email by her/his personal student assistant. If the questionnaire had still not been answered by Thursday, the participant was reminded by telephone by her/his personal student assistant (when participants could not be reached by telephone a second reminder email was sent out). Friday the electronic questionnaires were closed. Thus, all event descriptions and ratings were completed maximum 12 days after the occurrence of the event. There was one exception to this procedure: During the Christmas week, the electronic questionnaires were extended for three days to ensure responses and the reminder procedure was cancelled. Each month the participants received a book gift of their own choice (approximate value \$55).

The test session, first part. The participants were instructed to tell the segment of their life stories extending over their first term at university in approximately 15 minutes (see Appendix A for verbatim instructions). They were allowed to ask questions and given five minutes to think about what to include. After the five minutes had passed the participants were given the first sentences of the instruction again and informed that if they were still in the process of telling the story after 15 minutes they would be given a sign, so that they knew they should finish their story. The student assistant then listened to the life story segments without interrupting the participants. If participants finished telling the story before 15 minutes had passed they were given up to two neutral prompts. The test session then included a second part. Here, participants were asked to 1) recall three memories from their diary that were important to their life stories; and 2) were cued with six headings of events from their diary (randomly selected) in order to elicit memories that were low on life story relevance. However, many participants had difficulties recalling events that they had reported in the diary, presumably because of the difficulties of the test (e.g. recall specific memories from 3.5 years ago, that were both reported in the diary as well as important to their life stories). Hence, the second part yielded a low number of events to be included in the analyses. Because of this, we focus on the data from the third part of the test session. In order to examine whether the second part of the test session affected the results from the third part of the test session, all analyses are reported with and without including memories cued or recalled as a part of this second part of the test session.

The test session, third part. Here we examined which factors would predict remembering and life story importance including all specific memories from the diary. The participant was given a booklet with all events from the diary in random order and for all events was asked whether she/he remembered the event (see Appendix A for verbatim instructions). We

selected a dichotomous measure of remember-forget because previous studies have operationalized remembering as a dichotomous variable (e.g. research on remember-know responses by Gardiner and colleagues, for example Gardiner, Richardson-Klavehn, & Ramponi, 1997). Participants were also asked to date the events they remembered but these data are not further reported here. If participants did not remember the event, they continued to the second event in the booklet and so on until all events had been assessed for memory and dating (one participant did not complete the full procedure, because she brought her newborn baby to the test session, and her data are included in analyses only with the events she completed).

Finally, the participants were asked to rate all remembered events on life story importance and reliving qualities. Life story importance was measured by five questions adapted from the Centrality of Event Scale, which operationalized life story importance as connections between the specific memory and other material in life stories (Berntsen & Rubin, 2006) (questions 8-12 in Table 1). All items were rated on 7-point scales anchored with 1 = *not at all* and 7 = *to a very high degree*. The internal reliability was .83, and the items were added to form a total for use in the analyses.

Reliving qualities were measured by five items adopted from previous studies (e.g., Berntsen, Willert, & Rubin, 2003; Sheen, Kemp & Rubin, 2001; Rubin et al., 2003) (questions 13-17 in Table 1). These items are widely used to assess the phenomenological quality of specific memories and assess central characteristics of specific memories, like visual and emotional imagery, reliving, and a subjective sense of travelling back in time (e.g. Brewer, 1986; Conway, 2009; Rubin et al., 2003; Tulving, 2002). All items were rated on 7-point scales anchored with 1 = *not at all* and 7 = *to a very high degree*. The internal reliability was .86 and the items were added to form a total for use in the analyses. We selected a continuous measure of life story importance and reliving qualities because these are typically conceptualized and operationalized as continuous constructs (as testified in the literature that the items were derived from).

The participants were then debriefed and received a book voucher worth approximately \$86 for their time.

Three participants were not able to travel to the Department and were therefore tested over the telephone. These participants were sent the booklet by mail and asked not to open the envelope. They received the instruction for part 3 of the test session for the first three events. They were then asked to complete the remaining events by themselves and lastly rate all

remembered events on the life story importance and reliving questions. They returned the completed booklet in a pre-stamped envelope. These three participants are included in all analyses of part 3 of the test session. Excluding them did not change the general pattern of results.

Results

Below we report the results in three sections. First, we describe how many events are remembered, the reliving qualities of specific memories, and their importance to life stories. Second, we test the first and the second hypotheses on event characteristics predicting remembering and life story importance. Here we also report analyses on reliving qualities. We test the hypotheses using logistic and multiple regression, because these analyses are commonly used in memory research. But note that we report multilevel analyses of the hypotheses as well and that these yield similar results (see footnotes 1-3). Finally, we examine the consistency of specific memories' importance to life stories between the 3 months follow-up (reported in Thomsen et al., 2012) and the present 3.5 year follow-up.

3.0. Remembering, reliving qualities, and life story importance

The 45 participants all in all rated 1870 events in their diaries. The average number of events rated was 41.55 (range 22-44). At the 3.5 year follow-up, the participants remembered 1126 of the 1870 events, i.e. 60.2%. There were large individual differences in the rate of forgetting, i.e. between 11.6% and 77.3%, but the rate of forgetting did not differ by gender ($t(43) = .61, p > .05$; women $M = 38.31\%$ ($SD = 16.03$) and men $M = 41.29\%$ ($SD = 16.55$), $r = .09$).

The average score for reliving was 3.57 ($SD = 1.40$), corresponding to a rating of medium reliving. There were large individual differences in ratings of reliving qualities, i.e. the mean reliving qualities ranged between 1.96 (low degree of reliving) and 5.30 (more than medium reliving). Women rated their specific memories significantly higher on reliving than did men ($t(42) = 2.55, p < .05$; women $M = 3.80$ ($SD = .80$) and men $M = 3.21$ ($SD = .74$), $r = .37$).

The average score for life story importance was 2.84 ($SD = 1.40$), corresponding to a rating of little to medium life story importance. The distribution of memories from no to high life story importance can be seen in Figure 2 (decimals rounded to the nearest whole number). Clearly the majority of memories retained after 3.5 years were of no or little importance to life

stories. If one classifies memories with a life story importance score above 4 as life story memories, only 19.57% of remembered events can be considered life story memories. Again there were large individual differences in the life story importance assigned to remembered events, i.e. the mean life story importance ranged between 1.36 (no importance to life stories) and 4.47 (medium importance to life stories) for the participants. There were no gender differences in average life story importance assigned to memories ($t(42) = 1.10, p > .05$; women $M = 2.90$ ($SD = .79$) and men $M = 2.67$ ($SD = .56$), $r = .17$).

These results clearly show that many specific memories are retained over a fairly long time interval, that retained specific memories vary in their reliving qualities, and that life story memories are only a small subset of such long-term specific memories.

3.1. Event characteristics associated with remembering and reliving qualities

To test our first hypothesis, that remembering at the 3.5 year follow-up would be predicted by unusualness and rehearsal as rated during the diary, we first calculated a mean score for all event variables for forgotten and remembered events respectively. We then conducted a within-subject t-test comparing forgotten and remembered events on the event characteristics from the diary. The results can be seen in Table 2 (note that we corrected for multiple comparisons by dividing the significance level of .05 with the number of comparisons made (e.g. 7) and that the corrected level of significance is $p < .007$). Events that were remembered at the 3.5 year follow-up were initially rated higher on unusualness, rehearsal, importance, and emotional intensity compared to events that were forgotten.

To examine whether each event characteristic predicted unique variance in remembering after controlling for the other event characteristics, we ran a logistic regression with remembering-forgetting (1-0) as the dependent variable and all the event characteristics as the predictor variables (entering participants as dummy variables). The overall model was significant ($\chi^2(51) = 309.61, p < .05$, Cox & Snell $R^2 = .15$). The results for each event characteristic can be seen in Table 3. In agreement with predictions, higher unusualness and higher rehearsal at the diary entry predicted remembering of the event 3.5 years later. In addition, events that were rated as more planned were also more likely to be remembered.¹ Note however, that the amount of variance explained by the event characteristics was low, possibly due to the dichotomous measure of remember-forget.

As a part of participating in the first three months follow-up (reported in Thomsen et al., 2012), the participants had recalled or been cued with a selection of events from their diary (typically between 7-9). Because recalling these events as a part of the three months follow-up may have affected memory for the events, we re-ran the analysis excluding events that had been recalled or cued at the three months follow-up. The pattern of results was similar. Also, the results were similar when excluding events that participants had been cued with or recalled in the second part of the test session (contact first author for details).

Because a central characteristic of remembering specific memories is their reliving quality, we examined whether event characteristics would predict reliving qualities of remembered events. We first ran a series of Pearson's correlations between reliving qualities and all event characteristics (see Table 4; although these correlations violate the independence assumption they provide descriptive data on the relations between event characteristics and reliving). To examine whether each event characteristic predicted unique variance in reliving after controlling for the other event characteristics, we ran a multiple regression with reliving as the dependent variable and all the event characteristics as the predictor variables (entering participants as dummy variables). The overall model was significant ($F(50, 1050) = 16.70, p < .05, adj. R^2 = .42$). The results for the event characteristic can be seen in Table 3. Only higher emotional intensity and rehearsal as well as lower planning were related to more reliving. Because two of the reliving questions explicitly addressed reliving of emotions (questions 16 and 17 in Table 1) and this may favor emotional intensity as a predictor, we re-ran the regression using a total of the reliving questions not addressing emotional reliving (e.g. questions 13-15 in Table 1). In this regression, increased emotional intensity and higher rehearsal were again related to more reliving and were the only significant predictors (both β s = .14, $ps < .05$).²

The pattern of results was similar when excluding events that participants had been cued with or recalled as a part of their participation in the three months follow-up (reported in Thomsen et al., 2012). Also, the results were similar when excluding events that participants had been cued with or recalled during the second part of the test session in the present study.

3.2. Event characteristics associated with importance to life stories

In order to test our second hypothesis, that life story importance at the 3.5 year follow-up would be predicted by goal-relevance, emotional intensity, importance, positive valence, and rehearsal as rated during the diary, we first ran a series of Pearson's correlations between life

story importance and all event characteristics (although these correlations violate the independence assumption they provide descriptive data on the relations between event characteristics and life story importance). The results can be seen in Table 4. All event characteristics except unusualness were related to life story importance. Thus, events that were more goal-relevant, important, emotionally intense, rehearsed, planned, and more positive were more likely to be considered highly important to life stories.

To examine whether each event characteristic predicted unique variance in life story importance after controlling for the other event characteristics, we ran a multiple regression with life story importance as the dependent variable and all the event characteristics as the predictor variables (entering participants as dummy variables). The overall model was significant ($F(50, 1057) = 13.17, p < .05, adj. R^2 = .36$). The results for each event characteristic can be seen in Table 3. In agreement with predictions, higher goal-relevance, emotional intensity, and importance were associated with more life story importance. In addition, higher degree of planning was related to higher life story importance. Rehearsal was not associated with life story importance, although it showed a trend in the expected direction.³ The pattern of results was similar when excluding events that participants had been cued with or recalled as a part of their participation in the three months follow-up (reported in Thomsen et al., 2012). Also, the results were similar when excluding events that participants had been cued with or recalled during the second part of the test session in the present study.

Because it was expected that positive valence would be associated with higher life story importance, we examined this event characteristic in more detail. The raw correlations revealed that positive valence was most strongly related to planning and importance (see Table 4). When removing importance and planning from the regression, positive valence predicted higher life story importance, although the beta was still low ($\beta = .05, p < .05$). Thus, it appears that important and planned events are often positive and that the importance and planned nature of events is more closely associated with life story importance than positive valence as such.

In summary, these results show that unusualness, planning, and rehearsal are associated with remembering, whereas goal-relevance, emotional intensity, importance, and planning are associated with life story importance. This indicates that goal-relevance is not centrally involved in the long-term retention of specific memories, as the self-memory system theory would seem to suggest (Conway, 2005), but rather is involved in whether specific memories become important to life stories. More broadly speaking, the results also emphasize that remembering and life story

importance involve different processes and that both processes should be included in a comprehensive theory of autobiographical memory.

3.3. Consistency of life story importance

In this section, we examine the consistency of life story importance of specific memories across three years. At the three months follow-up, participants recalled up to three specific memories that were important to their life story and up to three specific memories that were not important to their life story (Thomsen et al., 2012). We compared these two groups of specific memories on importance to life stories as rated at the present 3.5 year follow-up (e.g. ratings on questions 8-12 in Table 1). Consistent with expectations, specific memories that were recalled as important to life stories at the three months follow-up were rated higher on life story importance at the 3.5 year follow-up compared to specific memories, that were not important to life stories at the three months follow-up ($M = 4.03$ ($SD = 1.46$) and $M = 2.92$ ($SD = 1.40$), respectively, $t(145) = 4.68$, $p < .05$, $r = .58$).

At the three months follow-up, the three specific memories recalled as important to the life story and the three specific memories that were remembered but not important to the life story were all rated on a single item measuring importance to life stories (as a manipulation check; e.g. "How important do you think this event is to the part of your life story, which you just told?" Anchored with 1 = not important at all and 7 = very important) (see Thomsen et al., 2012). Another way to examine the consistency of life story importance is to correlate this rating of life story importance from the three months follow-up (using the single item) with the rating of life story importance at the 3.5 year follow-up (using the total of questions 8-12 from Table 1). Although the two measures are not exactly the same, they both operationalize the participants' subjective evaluation of how important specific memories are to life stories, and should thus be comparable. The correlation between these two measures was $r(145) = .45$, $p < .05$), suggesting a moderate degree of consistency between the two ratings that were approximately three years apart (note that the fact that the two measures are not the same may actually lower this correlation and lead to underestimation of consistency). Examining the change in ratings across the three years, the average change was a reduction of .34, but changes varied between a 4.4 reduction and a 4.8 increase.

In combination, these results suggests that the life story importance of specific memories is somewhat stable, a result which is also indicated by the findings reported above,

that *initially* rated event characteristics predicted life story importance over 3.5 years. At the same time, the life story importance of specific memories decrease with time, probably as result of incorporating new specific memories that relates to new themes and periods in the current representations of life stories. While there is moderate consistency of life story importance across the three years, some specific memories changed their life story importance dramatically, as testified by the large maximum changes.

Discussion

We asked 45 participants to describe and rate two events per week from their first term at university. We selected this period, because it is an important transition that is likely to give rise to a high number of specific memories important to life stories. Three and a half years later we provided participants with their descriptions of the diary events in random order and asked them whether they remembered these events and asked them to rate remembered events on life story importance and reliving quality. Participants remembered 60% of the events from the diary. Most of these long-term specific memories were considered of little importance to life stories. Initial processing of the events predicted both later remembering and life story importance, but the type of initial processing differed. Higher unusualness, planning, and rehearsal were critical for whether events were remembered in the long term, whereas higher goal-relevance, emotional intensity, importance, and planning were critical for whether events were perceived as important to life stories. These results suggest that long-term memory of specific events depend on the event being distinct and rehearsed, rather than important to long-term goals, as would seem to be suggested by the self-memory system theory (e.g. Conway, 2005). In addition, we found that specific memories that were important to life stories at three months follow-up (reported in Thomsen et al., 2012) were still rated higher on life story importance at the present 3.5 year follow-up compared to specific memories that were perceived as less important to life stories at the three months follow-up. Analyses also showed a moderate consistency of life story importance across the three years, although some specific memories changed dramatically in life story importance. Below, we elaborate on the implications of the present results for the understanding of autobiographical memory and life stories.

4.0. Autobiographical memory and life stories

The present findings supports the notion that the relationship between autobiographical memory and life stories is best conceived of as a partial overlap, where only a minority of specific memories, which are highly goal-relevant, important, and emotional, become important to life stories. Presumably, the more mundane memories contain information that is distinct, and may be used to direct behavior in situations, where the individual has not formed categorical memories or scripts (see example in Appendix B; Pillemer, 1998; Schank, 1999). Such memories may also serve social purposes, as they can easily be told as entertaining, but not too personal, stories in social settings (McLean, 2005). Life story importance and reliving qualities only correlated moderately, suggesting that although not important to life stories, some of these more mundane specific memories may still be associated with a high degree of reliving. The present analyses showed that emotional intensity and rehearsal predicted reliving qualities, a finding which is consistent with previous studies (e.g. Rubin et al., 2003).

A further question is, whether the term autobiographical memory should then be reserved for memories that are considered important to life stories, with more mundane memories being termed something else (Bluck & Habermas, 2000). Although such a division would seem to be supported by the current findings, we believe that considering all specific memories autobiographical, but with varying degrees of importance to life stories, is a more parsimonious conception. First, importance to life stories seems to be gradual rather than dichotomous, making clear distinctions between life story memories and more mundane memories difficult. Second, because although initial event characteristics predicted whether events would be considered important to life stories 3.5 years later and there was a moderate consistency in life story importance over time, some specific memories clearly shifted their status, as evidenced by the high maximum change scores. Thus, specific memories that were initially perceived as merely distinct, and thus not a part of the life story, may over time be re-interpreted as highly goal-relevant, because they are later seen as the beginning of an important theme in the life story. A well-known example of this process is Linton's observation that "meeting a shy scholar 5 years earlier takes on new importance when I begin to date and decide to marry him" (Linton, 1986, p. 64). In fact, the notion that some events, which are remembered, but initially perceived as unimportant, can later become a part of new and more adaptable life stories, is a corner stone of narrative therapy (White & Epston, 1990).

The more mundane long-term memories may be integrated into other structures of the autobiographical knowledge base. One possibility is that memories of distinct events are

associated with general events (Conway, 2005; Schank, 1999) that are not a part of overall life stories. Thus, the distinct memory of having a bus driver taking you to your physician for the first time (see Appendix B) could be associated with a categoric memory of “seeing the physician” and/or the extended memory of “the period where I experienced sudden pains” that are both of minor importance to the story (unless you later become a chronic pain patient or marry the bus driver).

4.1. Autobiographical memory, goal-relevance, and positivity effect

In disagreement with predictions derived from the self-memory system theory (e.g. Conway, 2005), long-term goal-relevance was not predictive of which events were accessible as specific memories 3.5 years later. Rather, events that were highly unusual, often rehearsed as well as more planned (perhaps allowing for pre-event rehearsal), were more likely to be remembered. This is consistent with the literature on episodic memory, where distinctiveness and rehearsal have been shown to enhance memory (e.g., Hunt, 1995; Greene, 1987). The fact that the present correlational results are in agreement with findings in experimental studies lends strength to the present results and indicates that distinctiveness and rehearsal may cause specific memories to become retrievable over long retention intervals. Distinctiveness is presumably related to the long-term retention of specific memories because it prevents the memory from becoming a part of more generic representations, like categoric memories, and thus “forgotten” as a specific memory (Hunt, 1995; Linton, 1982; Schank, 1999). Note that distinctive events may be relevant for short-term goal-processing, even though they are not considered relevant to long-term goals. Among specific memories retained over the long-term based on distinctiveness, the subgroup of memories high on goal-relevance, importance, emotional intensity, and planning may then become a part of life stories.

Together these findings imply that the self-memory system theory (e.g. Conway, 2005) could be adapted to include distinctiveness and rehearsal as central for remembering, while goal-relevance, emotional intensity, and importance would be central for explaining which specific memories may become important to life stories. High goal-relevance may ensure a stronger organizational embedding of the specific memory making it more accessible. The accessibility of distinct specific memories, low on goal-relevance, may depend more on overlap between the situation and the content of the memory, and such memories may come to mind spontaneously to direct the individual's behavior (Berntsen, 2009; Pillemer, 1998). As mentioned above, the long-

term retention of more mundane memories may also provide individuals with the opportunity to change their life stories and associated self-images. Such a system would seem adaptable, because it allows individuals stability in life stories and the associated self-images, based on selecting specific memories as important parts of life stories, while at the same time retaining specific memories that are important for other purposes and that may form the foundation for a later change in life stories. In this view, individuals keep the self-memory system stable not by forgetting events that interfere with coherence, but by assigning them less importance, which ultimately results in a system that is more flexible.

More generally, the finding that event characteristics measured 3.5 years before the test predicted which events were selected to be important to life stories support the notion that individual differences, in the form of goals, play an important role for selecting events into life stories. The finding that life story memories are highly goal-relevant and emotionally intense suggests that at least some life story memories may also be self-defining memories, which are memories characterized by goal-relevance, strong emotion, and frequent rehearsal (Singer, Blagov, Berry, and Oost, 2013; Singer & Salovey, 1993). Those life story memories that also capture important recurrent concerns and are linked to other memories with similar themes, may over time become self-defining memories and form the basis of narrative scripts that represent typical ways of processing emotional information and direct behavior (Singer et al., 2013).

One finding that was somewhat surprising was the lack of a positivity effect, that is, positive events were not more likely to be selected for inclusion into life stories, when controlling for other event characteristics. Although this finding replicates the first test of our participants (Thomsen et al., 2012), we expected the positivity effect to appear over time. However, as the additional analyses suggested, high degree of importance and planning were related to positivity and were more predictive of life story importance than positivity. Planning was not significantly related to neither remembering nor life story importance in the initial diary test (Thomsen et al., 2012). However, it is possible that high degree of planning is an expression of a positivity bias, which is not focused on the affective quality of the experience, but rather on whether it is controllable or not. Thus, events that are planned in advance may be events perceived to be highly controllable. This is in agreement with the original formulation by Taylor and colleagues, who suggested that positive illusions may take the form of “exaggerated perceptions of control” (p. 193) as well as affectively positive self-evaluations (Taylor & Brown, 1988). Thus, the preference for planned events in both remembering and life story importance

may reflect that individuals are biased towards retaining controllable events and selecting these as important parts of their life stories and hence their self-understanding (see also Glück & Bluck, 2007).

4.2. Consistency of life story importance

The present study is the first to examine the long-term stability of life story importance in specific memories. The finding that the perceived life story importance of specific memories was moderately consistent across three years indicates that although life stories are dynamic, there is also some stability in which specific memories are considered important to life stories. This stability in life stories presumably derives from the initially appraised goal-relevance, emotional intensity, planning, and importance of the specific memory, as indicated by the other results from the study. The stability of life stories may be functional in establishing self-continuity, which would seem more difficult to achieve if life stories changed dramatically from one month to the next. Although specific memories may generally become less important to life stories as the individual enters new contexts and relationships, they help the individual maintain a sense of who she or he was in the past. Such specific memories may then be used to explain how the individual has changed in some ways and remained the same in other ways, thus establishing self-continuity. If the specific memories, that the individual referred to when explaining changes and assessing stability, changed dramatically over time, explaining changes and stability would become much more complicated and perhaps lead to a diminished sense of self-continuity.

Although there was some stability in life story importance, the finding that some specific memories did change dramatically in life story importance suggests that as some themes or periods in life stories are replaced by others, the specific memories associated with these themes or periods may be reduced or enhanced in their life story importance. For example, an individual may appraise specific memories associated with a romantic relationship as very important to her life story during her first term at university. But as the relationship dissolves and is replaced by a longer lasting romantic relationship, the specific memories associated with the first term romantic relationship may seem of little relevance to her life story.

4.3. Limitations

The major limitation of the present study is that explained variance was generally low. This may indicate that processes not measured in the present study play a role for remembering, reliving, and life story importance. One possibility is that social and cultural factors, in the form of conversations and cultural norms, also play a role (Berntsen & Rubin, 2004; Habermas & Bluck, 2000; McLean et al., 2007; Thomsen & Berntsen, 2008). Most often these factors would work in concert with the individual's goals, that is, events that are highly goal-relevant are often shared with others and may also be events that are considered important in the cultural context. Another reason for the low degree of variance explained may be that later events change the appraisal of earlier events. Thus, a strong emotional reaction may prove to be unwarranted, when it turns out that it was based on an incomplete appraisal of the situation. Such re-appraisals may influence both whether events are remembered and considered important to life stories over the long term.

A further limitation is that the results may not generalize to other ways of testing memory. For example including distractor events may have affected the results. In addition, asking participants to rate remember-forget on a continuous measure more similar to the measures of life story importance and reliving qualities may have yielded different results.

4.4. Conclusion and perspectives

The present study showed that life story memories were a small subset of long-term specific memories, and that different processes were involved in remembering an event and considering an event important to life stories. Events that were more unusual, planned in advance, and rehearsed were more likely to be remembered over time. Such events form a large pool of long-term specific memories, where the subgroup of specific memories considered highly relevant to long-term goals, emotionally intense, important, and planned in advance are more likely to be important to life stories. The life story importance of these specific memories is moderately stable over time, which may help the individual maintain a sense of self-continuity.

The present study begins to examine why specific memories are retained over time and why they become a part of life stories. However, the study did not examine processes taking place after the initial experience of the event, e.g. re-appraisal, consolidation, re-encoding etc. and how these processes were related to the organizational embedding of the memory and long-term memory. Furthermore, the study focused on specific memories, but temporally extended autobiographical memory, e.g. life time periods or chapters, as well as categoric memory, is an

important part of autobiographical memory and life stories (Conway, 2005; Thomsen 2009). Future studies need to address how such extended and categoric memories are formed and interact with specific memories and life stories.

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Table 1

Questions for event variables, life story importance and reliving

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1. "How important was the event to you?" Rated on 7-point scales anchored with 1 = not at all and 7 = very important.
 2. "Was the event planned or was it totally unexpected? Sometimes an event is planned, but then turn out in an unexpected way. In that case, please rate the event from 2-6, depending on how unexpected the outcome was". Rated on 7-point scales anchored with 1 = totally unexpected, 4 = planned, but with partly unexpected outcome and 7 = totally according to plan.
 3. "Independent of whether events are planned or not, they may be more or less unusual, depending on how often you have experienced this type of event. How unusual was the event to you?" Anchored with 1 = not unusual at all and 7 = very unusual.
 4. "How much have you thought about the event, since it happened (except for thinking about it now)?" Anchored with 1 = not at all and 7 = very often.
 5. "Some events are very important to our long-term goals, while others are less important to our goals. Events that are important to our goals may both aid and block our goals. To which degree and in which way was the event important to your goals, when it happened?" Anchored with 1 = blocked my goals to a high degree, 4 = not relevant to my goals and 7 = aided my goals to a high degree. (Recoded so that 1 and 7 indicated high goal-relevance, 2 and 6 indicated medium goal-relevance, 3 and 5 indicated low goal-relevance and 4 indicated no goal-relevance; yielding a scale from 0-3 with increasing numbers indicating increased goal-relevance).
 6. "How emotionally intense was the event to you?" Anchored with 1 = not intense at all and 7 = very intense.
 7. "How would you describe the event emotionally?" Anchored with 1 = extremely negative, 4 = neutral or mixed and 7 = extremely positive.
 8. "I feel that this event has become a central part of my life story."

9. "This event is a symbol of important themes in my life story."
 10. "If I were to weave a carpet of my life story, this event would be in the middle with threads going out to many other events."
 11. "This event was the start of a new chapter in my life story."
 12. "I can see connections and similarities between this event and many other memories, also memories from other periods."
 13. "This memory comes with a sense of travelling back in time to the event."
 14. "When I recall this event, it is like I relive it all."
 15. "When I recall this event, I can see what happened."
 16. "When I recall this event, I relive emotions from the event."
 17. "When I recall this event, I get a bodily emotional reaction (e.g. sensations in my stomach, palpitation, warmth, restlessness, tension)."
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Table 2

Events characteristics (as measured during the diary period) for events remembered or forgotten at the 3.5 year follow-up

Event characteristic	Forgotten	Remembered	95% confidence interval of difference	<i>t</i> (44)	<i>r</i>
	<i>M</i> (<i>SD</i>)	<i>M</i> (<i>SD</i>)			
Unusualness	4.07 (.81)	4.64 (.75)	-.77 to -.37	5.80*	.66
Planning	3.80 (.63)	3.86 (.64)	-.30 to .18	.51	.08
Rehearsal	4.13 (.78)	4.67 (.65)	-.68 to -.40	8.00*	.77
Goal-relevance	1.19 (.47)	1.23 (.40)	-.15 to .06	.87	.13
Importance	4.52 (.89)	4.88 (.83)	-.52 to -.20	4.57*	.57
Emotional intensity	4.05 (.88)	4.49 (.74)	-.60 to -.27	4.37*	.55
Emotional valence	4.69 (.61)	4.75 (.47)	-.24 to .11	.73	.11

* $p < .001$

Table 3

Regressions predicting remembering, reliving qualities, and life story importance at the 3.5year follow-up from event characteristics as rated during the diary period (B and β for participant dummy variables not shown)

	Remembering	Life story importance	Reliving
Event characteristic	B (SE)	β	β
Unusualness	.19* (.04)	.03	.04
Planning	.09* (.03)	.09*	-.06*
Rehearsal	.17* (.05)	.07	.13*
Goal-relevance	-.10 (.06)	.23*	-.03
Importance	.03 (.05)	.13*	.001
Emotional intensity	.07 (.05)	.10*	.20*
Emotional valence	.03 (.04)	.01	-.04

* $p < .05$

Table 4

Correlations between event characteristics (as measured during the diary period), life story importance, and reliving qualities (both as measured at the 3.5 year follow-up)

Event characteristic	2	3	4	5	6	7	8	9
1. Unusualness	-.29*	.38*	.11*	.15*	.27*	-.10*	.06	.16*
2. Planning	-	-.16*	.03	.06*	-.18*	.35*	.13*	-.13*
3. Rehearsal	-	-	.37*	.59*	.62*	.02	.30*	.28*
4. Goal-relevance	-	-	-	.43*	.23*	.05	.35*	.08*
5. Importance	-	-	-	-	.56*	.24*	.35*	.21*
6. Emotional intensity	-	-	-	-	-	.01	.24*	.33*
7. Emotional valence	-	-	-	-	-	-	.09*	-.08*
8. Life story importance-		-	-	-	-	-	-	.47*
9. Reliving								

* $p < .05$

Figure 1

Overview of the study

Figure 2

Percentage of specific memories considered of no, medium, and high life story importance

Footnotes

1. We also analyzed predictors of remembering using multilevel modeling for categorical outcomes (using SPSS, version 21). In this analysis, each participant was considered to nest the memories, which was each associated with either remember or forget and measures of all the event variables (goal relevance, importance, emotional intensity, unusualness, planning, rehearsal, and valence). Thus, participant was entered as the nesting variable, and the event variables were entered as predictors of remembering. We examined random intercept, but not random slopes. The intercept for participants was significant ($b (SE) = 1.91 (0.36)$), meaning that there were individual difference in remembering not explained by event variables. More interestingly, the results showed that a higher degree of unusualness ($b (SE) = .19 (.04)$), planning ($b (SE) = .09 (.04)$), and rehearsal ($b (SE) = .16 (.04)$) were also significant predictors of remembering. The results were thus similar to the results of the regression analysis.
2. We also analyzed predictors of reliving qualities using multilevel modeling for continuous outcomes (using SPSS, version 21). In this analysis, each participant was considered to nest the memories, which was each associated with a given level of reliving qualities and measures of all the event variables (goal relevance, importance, emotional intensity, unusualness, planning, rehearsal, and valence). Thus, participant was entered as the nesting variable, and the event variables were entered as predictors of reliving qualities. We examined random intercept, but not random slopes. The intercept for participants was significant ($b (SE) = 13.71 (3.17)$), meaning that there were individual difference in reliving qualities not explained by event variables. More interestingly, the results showed that only emotional intensity ($b (SE) = .86 (.14)$), planning ($b (SE) = -.21 (.10)$), and rehearsal ($b (SE) = .56 (.15)$) were also significant predictors of life story importance. The results were thus similar to the results of the regression analysis.

3. We also analyzed predictors of life story importance using multilevel modeling for continuous outcomes (using SPSS, version 21). In this analysis, each participant was considered to nest the memories, which was each associated with a given level of life story importance and measures of all the event variables (goal relevance, importance, emotional intensity, unusualness, planning, rehearsal, and valence). Thus, participant was entered as the nesting variable and the event variables were entered as predictors of life story importance. We examined random intercept, but not random slopes. The intercept for participants was significant ($b (SE) = 8.01 (2.00)$), meaning that there were individual difference in life story importance not explained by event variables. More interestingly, the results showed that a higher degree of goal relevance ($b (SE) = 1.48 (.18)$), importance ($b (SE) = .53 (.14)$), emotional intensity ($b (SE) = .38 (.15)$), planning ($b (SE) = .33 (.10)$), and rehearsal ($b (SE) = .34 (.16)$) were also significant predictors of life story importance. The results were thus similar to the results of the regression analysis, except that rehearsal was significant in the multilevel model.

Appendix A

Verbatim instructions during diary period and test session

Instruction given each week during the diary period: "Before you answer the questionnaire, please spend approx. 5 minutes to think back on the past week – i.e. from Monday through Sunday last week. After the five minutes, please select the two specific events that come to mind first. With specific events, we mean events lasting no more than one day - the event can last anywhere from several minutes to a day. We are not interested in any particular type of event. It is entirely up to you what you choose - it can be important and less important, positive and negative, emotionally intense and more neutral, unusual or more typical. Some weeks it might be easy to think of two events, other weeks it may seem as if there is nothing worth reporting. Even in these weeks we will ask you to select two events, even if you may basically not think it is something worth talking about".

Instruction given at first part of the test session: "In this interview I will ask you to tell a segment of your life story, i.e. the story about experiences from your first term at university, that is, the period when you participated in the diary study (beginning of September, 2007 until end of January, 2008). Try to make the story last approximately 15 minutes. You can include anything you like and all areas of your life. I will not ask any questions during your story, just tell the story any way you like. There is no right or wrong way to do this. You decide what to include, how to tell it, and how you compose your story. You have previously participated in an interview, where you were asked to do the same thing. But this is a new interview, and it is completely up to you whether you tell the same or something completely different. The most important thing is that you tell the story the way you think about it now. For now, you will have 5 minutes to think about how you would like to tell about this segment of your life story. Here is a piece of paper, where you may write keywords, as you think about how to tell the story. Do you have any questions?"

Instructions given in the third part of the test session: "In this part of the session, I will give you a booklet with the event descriptions you made as a part of your diary. The events are presented in random order. For each event I will ask you whether you remember it. When I ask you about this I am referring to the event itself, not writing about it in the diary. So do not consider whether you remember writing down the event but whether you remember the event itself. If you remember the event you will be asked to date it. Some events you may remember but may not be able to date, whereas other events you may not remember, but you might be able to estimate a date. It is very important that you answer these two questions separately, that is, first whether you remember the event and only afterwards try to date it while you think aloud". After receiving the booklet the participants were instructed: "Now I will read a heading corresponding to the first event in your booklet. I will ask you to then read the description to yourself and let me know, when you have finished". Participants were then asked whether they remembered the event.

Appendix B

Abbreviated examples of forgotten events and remembered events low and high on life story importance (male student, 23 years at the follow-up)

Forgotten events

Event 1: "Monday evening all active participants in HHG [student organization] were meeting at one of the participants' place. We were in teams that were responsible for different things, and I was in the shopping group. I came out of my lecture at 4 pm and then we went shopping for dinner. When we arrived, the cooking group took over and cooked a really nice lasagna. The meeting went on until 10.30 pm, and it was a very good meeting, very informative. We chatted and planned activities for the next 6 months. I wasn't home until midnight after a 16 hour day and went straight to bed after a great day".

Event 2: "Friday morning at 8 am we had our last practice session before the Christmas vacation. It was much too early in the morning for my taste, but we were practicing exams from last year to get some experience, and almost everyone was there, even if it was very early. We had a really nice time, where we solved a full exam set in 2 hours (we have 4 hours for the real exam), so it was great, and it calmed us down for the upcoming exam."

Remembered event low on life story importance

Event 1: "After my first lecture I suddenly got this incredible pain in my right side. Every time I tried to breathe it really hurt. I decided to go to the next lecture, hoping that the pain would go away, but after 45 minutes, where I couldn't really concentrate, I called my physician and got an appointment right away. However, I didn't know where my physician's clinic was located. I went off and was lucky enough to find a bus driver who knew where I was going. He even took a small detour from his usual route to drop me off in front of the clinic".

Event 2: “Wednesday I drove home to Aarhus from my mother’s place in the northern part of Denmark to meet with my study group. I had borrowed my mother’s car, and I left early in the morning to have as much time as possible with my study group. I had to pass by my flat to drop of some stuff, and as I swing into the parking lot in front of my flat, it hits me that I have forgotten my keys at my mother’s place. I couldn’t get into my flat. Right there it felt like time just stopped; the weather was shitty, rainy, and windy, and there I was with a three hour drive ahead of me, just to get a key. I decided to go and meet a couple of hours with my study group before driving back, even if it meant that I had to drive in darkness most of the way”.

Remembered events high on life story importance

Event 1: “Thursday there was a lecture in HHG [student organization]. The lecture started at 7 pm, but all active participants met at 5 pm to have pizza together and have a nice couple of hours together before the lecture. I had been very excited about how it would turn out, since it was also the first time I was there as an active participant. But it went really well, the lecture was very interesting, so it was a big success. After we had cleaned up, 8 or 10 of us went on to the student bar, where we had a couple of great hours drinking too many beers”.

Event 2: “I had invited a girl from HHG [student organization] to a movie. We had planned to meet about an hour before the movie started, and I was very tense, so I came to the cinema about 1.5 hour before the movie started. I spend the time in the hall in front of the cinema, reading a magazine on new movies. She came right on time. She was clearly feeling somewhat awkward and didn’t really know what to do with herself in the beginning. But since I had spent a lot of time reading the film magazine before she came, I could talk about the movies, and soon she began to relax and started to take over the talking (which suited me well, since I am really bad at leading the conversation with girls that I like). I was very happy with the hour we spend together before the movie, because my goal had been to get to know her better.”