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When does a wedding mark the beginning of a new chapter in one's life?

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Life story chapters may be formed in relation to substantial and enduring changes in material circumstances, and we explored this idea by capitalizing on naturally occurring variations in the change of material circumstances associated with marriage. In two studies, we asked participants to report whether they cohabitated before marriage and whether they relocated in connection with marriage, using these as proxies for material change. Participants described their wedding and rated it on memory characteristics along with scales measuring material change, psychological change, and centrality to identity. Next, they identified chapters within the romantic domain of their lives. Finally, they placed the wedding memory in a chapter and marked the temporal location of the memory on a timeline representing the chapter. In study 2, not cohabitating before marriage was associated with greater likelihood of locating the wedding memory as a starting point for a chapter. The results provide some support for the role of material change in shaping the formation of chapters.

Key words: Autobiographical memory, flashbulb memory, life story chapters.

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INTRODUCTION

When individuals remember their past, they do not just recall memories of circumscribed events, such as their wedding day. Several researchers have proposed that temporally extended autobiographical memory, such as lifetime periods and life story chapters (e.g., "my marriage"), is also a central aspect of reconstructing the past (Barsalou, 1988; Brown, Hansen, Lee, Vanderveen & Conrad, 2012; Conway, 2005; Thomsen, 2015). Barsalou (1988) found that when individuals were asked to recount their summer vacation, the most frequent memory component was temporally extended memory, such as "my trip to Europe." Since then, studies have confirmed that temporally extended memory is a frequent part of natural remembering (Pillemer, 1991; Steiner, Pillemer, Thomsen & Minigan, 2014; see Thomsen, 2015 for a review). They play a key role in organizing memories (Conway, 2005; Conway & Bekerian, 1987) and are central to constructing coherent life stories (McAdams, 2001; Thomsen, 2009).

Little is known about how individuals form temporally extended autobiographical memory. Brown *et al*. (2012) have suggested that change in material circumstances may be essential; when individuals experience significant changes in material circumstances followed by stability, temporally extended autobiographical memory is formed. We explored this idea in two studies capitalizing on naturally occurring variation in changes of material circumstances associated with marriage. While some couples cohabitate before marriage, others do not. Individuals who move in together for the first time after marriage experience more changes in material circumstances compared with individuals who cohabitated before marriage. If material change is central to the formation of chapters, individuals who did not cohabitate before marriage should be more likely to form a new chapter with the wedding as the starting point compared to individuals who cohabitated before marriage. Below, we review literature relevant to this idea and describe our study in more detail.

Material change and chapter formation

Temporally extended autobiographical memory is an umbrella term that includes a range of concepts, including lifetime periods (Conway, 2005), autobiographical periods (Brown *et al.,* 2012), and life story chapters (McAdams, 2001; Thomsen, 2009). All of these different terms focus on memory for temporally extended periods with beginnings and endings, including information about associated characteristics, such as people, places and activities (Brown *et al.,* 2012; Conway, 2005; Thomsen, 2015). Because of the methodology in the present study, we generally use the term life story chapter.

Although temporally extended autobiographical memory is acknowledged as a central part of autobiographical memory, this memory phenomenon is much less researched than memories of specific events. Illustrating this point, temporally extended autobiographical memory is only described briefly in the self-memory system theory (Conway, 2005). However, Brown *et al*. (2012) have proposed transition theory, where changes in material circumstances are assumed to offset the formation of autobiographical periods. For example, when individuals relocate to a new place, they experience changes in a wide range of material circumstances, such as the places they frequent, the people they see, and the activities they engage in. As these new circumstances repeatedly co-occur, mental representations of the places, people and activities become linked in complex networks forming a new autobiographical period (Brown *et al.,* 2012; Brown, Schweickart & Svob, 2016). Several studies support the idea that change followed by stability in material circumstances is

involved in the formation of autobiographical periods (e.g., Bohn & Habermas, 2016; Brown *et al.,* 2009, 2016).

Most existing studies examine public events, but life story chapters are personal in nature. When individuals are asked to identify chapters in their life stories, marriage and children, education and work, as well as living location are commonly mentioned (Steiner *et al.,* 2014; Thomsen, Lind & Pillemer, 2017). Consequently, studies examining the formation of chapters in relation to personal events are needed. Shi and Brown (2016) found that Chinese immigrants to Canada often dated memories with reference to immigration, indicating that the changes in material circumstances associated with immigration spurred the formation of a new autobiographical period. In addition, Uzer and Brown (2015) examined individuals with spinal cord injury based on the assumption that the injury would dramatically change material circumstances and spawn a new autobiographical period. Consistent with this idea, their results showed that participants often dated memories with reference to the injury. These and other studies rely on reference to transitions in dating memories. While this has yielded important insights about the organization of autobiographical memory, it is unclear whether such dating references tap into autobiographical periods or specific memories ("the day I arrived in Canada" vs. "living in Canada"). To address this concern, new methodological approaches are needed.

The present studies

In the present two studies, we strategically recruited participants who did or did not cohabitate before marriage (Study 1) or asked participants to report on cohabitation before marriage (Study 2), based on the assumption that individuals who did not cohabitate before marriage would experience more material change compared with individuals who cohabitated before marriage. Moving in together likely changes many daily routines. When it involves relocation, the material changes are even larger including new places (e.g., house, supermarket, gym) and people (e.g., neighbors, coffee shop staff). However, individuals who cohabitated before marriage may sometimes relocate to a new place in connection with marriage and as a result experience change in material circumstances. While we assumed that individuals who did not cohabitate before marriage would experience more material changes than those who did, we also examined relocation in relation to marriage. If changes in material circumstances are central to the formation of chapters, participants who relocated and experienced such changes should be more likely to form a new chapter with the wedding as the starting point. We examined this by asking participants to: (1) retrieve their memory of the wedding; (2) identify chapters in the romantic domain of their life; and (3) place the wedding memory on a timeline within the chapter the wedding was a part of. We checked our assumptions about degree of material changes associated with cohabitation and relocation by asking participants to rate material and psychological change associated with the wedding memory. Furthermore, if the wedding forms a starting point for the new chapter, it may be more memorable and thus rated higher on memory characteristics such as vividness and centrality to identity in participants experiencing higher degree of material change. This prediction was not derived from transition theory but based on studies indicating higher memorability of events at the end points of chapters (Thomsen & Berntsen, 2005).

STUDY 1: METHOD

Participants

Across two sites (Lafayette College and Denison University, US), 71 participants were tested over the course of 2 years (fall 2016 through spring 2018). Participants did not have to be currently married to participate, we only asked that they had been married. Of the 71 participants, 62 had been married only once (though of those, two had multiple wedding ceremonies with that same spouse) and of those, 55 were still currently married. Of the nine participants who had been married more than once, only one had been married more than twice. Concerning our proxies for material change, 41 cohabitated before marriage and 30 did not; 33 relocated in connection with marriage and 37 did not (one missing response).

Age ranged from 28 to 79 years (M = 49.77, SD = 12.30). The majority self-identified as non-Hispanic (N = 68) and White (N = 65), with roughly equal numbers of men (N = 37) and women (N = 34). Most participants were highly educated (N = 27 with at least an associate's degree, N = 38 with a master's, professional, or doctoral degree). The majority of participants were Christian (N = 37, including Protestant, Catholic, Orthodox and other denominations), with a sizable minority (N = 20) identifying as atheist, agnostic, or nothing in particular, and a small number identifying as Jewish (N = 7). The rest selected either "something else" (N = 4) or "prefer not to say" (N = 3).

Materials

Details and a copy of materials for Study 1 are available at [https://osf.io/hj3mg/].

Recall of wedding. This included free and cued recall components and was modeled on flashbulb memory procedures meant to elicit autobiographical memory narratives of specific events. The free recall question asked participants to "please describe your wedding in detail." This section also instructed participants who had more than one wedding to "describe the wedding you remember most vividly." This was followed by cued recall questions concerning aspects of the event.

Autobiographical memory questionnaire (AMQ). Related to recall of the wedding memory was a partial version of the Autobiographical Memory Questionnaire (AMQ; Rubin, Schrauf & Greenberg, 2003) probing phenomenological and metacognitive aspects of remembering, including vividness, re-experience, belief in recollection, significance, emotional valence and intensity, all rated on 1–7 scales, except valence which was rated from −3 to +3. Finally, participants were asked to date the wedding event by month, day, and year.

Chapter task. Participants were asked to define chapters of their life story from the domain of romantic relationships. This task was inspired by similar procedures utilized to elicit chapters in life stories (Thomsen & Berntsen, 2008). We focused on chapters in the domain of romantic relationships rather than chapters more broadly to minimize the workload for participants and increase the likelihood that they would list relevant chapters. For each chapter, participants were asked to provide a title and brief description as well as start and end dates. Participants were instructed that chapters themselves did not need to have a clear beginning nor end, that chapters could be parallel or could be unfinished. They were also told that there could be many chapters or few and that there was no right or wrong way to identify chapters. Upon completion of this task, participants were asked to identify which chapter included the wedding event (or the most important chapter if the wedding were included in more than one

chapter). Lastly, they were asked to mark along a timeline representing the chapter when during that chapter the wedding took place (see Thomsen & Berntsen, 2005 for this method). We had intended for the timeline to be 100 mm in length but a printing error led to it being 90 mm.

Transitional impact scale (TIS). The TIS was developed to measure external and internal change associated with a given event (Svob *et al.,* 2014). There are twelve total Likert scale items, six each for Material Change and Psychological Change. The items are rated on 1–5 point scales with higher values indicating greater change.

Centrality of events scale (CES). The CES (Berntsen & Rubin, 2006) assesses how central an event is to a person's identity and life story. There are seven items rated on 1–5 point scales with higher agreement indicating greater event centrality.

Demographics. Participants were asked about their marital history and demographics in two separate sections. For the first, participants were asked if they had more than one wedding along with follow up questions. With regard to the specific wedding described, they were asked whether they had cohabitated with their spouse prior to marriage and if so, for how long. They were also asked whether they relocated as a consequence of getting married and if yes, when and how far away (with the same city/location or to a new city/location or other). They were also asked if that relocation coincided with cohabitation.

Participants were finally asked their date of birth, gender, if they were of Hispanic/Latino ethnicity, their race, their highest level of education, their current religious affiliation, their childhood religious affiliation, and their current spouse's religious affiliation.

Procedure

First, participants provided informed consent consistent with our protocol as approved by the Lafayette College and Denison University Institutional Review Boards. Then, they were provided with general instructions stating that we were interested in understanding how people remember events from their lives. They were told that to do so, we would be asking them to recall events and answer questions about the characteristics of those events and of their memories for them. We asked them to answer as completely and honestly as possible while maintaining anonymity – they were told that they could use initials to represent people or places that they did not wish identified. Participants were asked to summarize these instructions and to re-read them if that summary was incomplete or inaccurate. Only after a complete and accurate summary were participants allowed to proceed.

The procedure was divided into four tasks from the participants' perspective. The first task included a word cue and dating protocol (omitted from this paper, see [https://osf.io/hj3mg/]). The second task included wedding event recall, demographic questions about that event, the AMQ, the TIS, and the CES. The third task included the chapter descriptions, identification of which chapter included the wedding, and when during that chapter (along a timeline) the wedding occurred. The fourth task included demographic information about age, gender, race, ethnicity, education, and religion. Upon completing all tasks, participants were debriefed and provided with $US10 compensation.

Results

A deidentified dataset as well as JASP analysis files and html output are available at [https://osf.io/hj3mg/]. When variables violated the assumption of normality, we report nonparametric tests.

We first examined relations between cohabitation before marriage and relocation to assess associations between our two proxies of material change: (1) cohabitation versus not cohabitation; and (2) relocation versus no relocation. Cohabitation was significantly associated with relocation, X^2 (1, N = 70, one missing response for relocation) = 4.43, p = 0.035 such that those who cohabitated were less likely to relocate as a consequence of getting married (did not relocate 26 vs. relocated 15), whereas those who did not cohabitate were more likely to relocate (did not relocate 11 vs. relocated 18).

In order to relate material change to memory characteristics, we divided our participants into three groups reflecting either no material change (N = 26), one material change (e.g., did not cohabitate before wedding *or* relocated in connection with wedding, N = 26), and two material changes (did not cohabitate before wedding *and* relocated in connection with wedding, N = 18). We decided against creating four groups to preserve a reasonable number of participants in each group and because either cohabitation or relocation both seem to represent a medium degree of change compared to changes in neither or both. In order to test our assumption that the two proxies for material change (cohabitation and relocation) were associated with self-reported material change, we examined scores on the TIS in relation to the three material change groups (see Table 1). A Kruskal-Wallis test showed significant differences on TIS material change (H[2] = 20.98, $p < 0.001$). Dunn's post hoc tests with Holm corrections showed that the group with no material change differed significantly from the group with one material change ($z = -3.48$, $p < 0.001$) and the group with two material changes ($z = -4.23$, $p < 0.001$), whereas the one change group did not differ significantly from the two changes group ($z = -1.09$, $p = 0.14$). For TIS psychological change, the pattern was similar: significant differences among the three groups (H[2] = 6.69, p = 0.04). Post hoc tests showed that the group with no material change differed significantly from the group with two material changes ($z = -2.41$, $p = 0.02$), but not from the one material change group ($z = -1.92$, $p = 0.05$) nor did the one change group differ significantly from the two changes group ($z = -0.67$, $p = 0.25$). In short, our assumption that relocation and cohabitation would be associated with more material change was supported and analyses showed that changes in material circumstances were accompanied by psychological change.

For the chapter task, there was no difference in the total number of chapters participants provided as a function of material change group, H (2) = 2.35, p = 0.31. We had provided space for up to 20 chapters and participants provided as few as one and as many as 13 chapters (M = 5.77, SD = 2.87). Most provided sequential chapters, organized by partner (i.e., a serial monogamy pattern). However, many participants' earlier chapters were summaries of early dating experiences (e.g., childhood crushes), some participants included chapters where they had not been in a long-term romantic relationship, and some included parallel chapters indicating infidelities.

We then examined differences in the formation of a new chapter with wedding as the starting point in relation to material change. We tested whether individuals experiencing more material change were more likely to show a pattern with the wedding memory at the beginning of the chapter compared with no material change individuals. We operationalized wedding memories as located to the beginning of the chapter if they fell into the first of nine equally sized bins of the timeline; wedding memories in the eight other bins were considered as not located to the beginning of the chapter. Across all participants, the wedding memory was more likely to be at the start of the chapter than expected due to chance alone, (X^2 [8, N = 66] = 64.36, $p < 0.001$, see Fig. 1). To examine whether the two material change variables predicted locating the wedding memory to the first time bin of the chapter, we conducted a logistic regression. We entered first bin versus all other bins as the dichotomous outcome variable, and cohabitation, relocation, and their interaction as predictor variables. The overall model was not significant χ^2 (61) = 3.82, p = 0.28 and neither were the effects of the predictor variables (see Table 2). To provide an overview of memory location within the chapters in relation to material change, we plotted the distribution of wedding memories for individuals with cohabitation versus no cohabitation (Fig. 2) and relocation versus no relocation (Fig. 3). Independent of material change, participants were more likely to locate the wedding memory to the beginning of the chapter, indicating that material change did not make it more likely that participants formed a new chapter with the wedding as the starting point.

Finally, we examined the phenomenological and metacognitive aspects of remembering the wedding event in relation to the three groups of material change (Table 1; see [https://osf.io/hj3mg/] for analyses on delay between wedding event and study participation). Surprisingly, analyses

Table 1. *Means (SD)* for transitional impact scale score, memory characteristics, and centrality of event shown by material change groups (no change, one change, and two changes in cohabitation and/or relocation) for Study 1 and Study 2

	Study 1			Study 2		
	No change	One change	Two changes	No change	One change	Two changes
Material change	2.31 (1.16)	3.56 (1.09)	3.99 (0.70)	2.34 (0.91)	3.43 (0.95)	3.88 (0.78)
Psychological change	2.78 (0.96)	3.31 (0.90)	3.53 (0.75)	3.02 (0.93)	3.19 (0.97)	3.28 (1.00)
Centrality of event	3.18 (0.96)	3.47 (1.08)	4.03 (0.63)	3.45 (0.90)	3.78 (0.79)	3.92 (0.65)
Vividness	5.19 (0.63)	5.31 (1.05)	5.28 (1.07)	5.34 (1.08)	5.32 (1.27)	5.59 (1.27)
Re-experience	4.08 (1.02)	4.35 (1.77)	3.83 (1.98)	4.69 (1.30)	4.94 (1.64)	5.16 (1.40)
Belief	2.00 (1.26)	2.50 (1.45)	1.61 (1.42)	6.09 (0.96)	6.02 (1.15)	6.44 (.84)
Significance	6.08 (1.13)	6.00 (1.41)	6.50 (0.79)	5.53 (1.35)	5.73 (1.32)	6.08 (0.98)
Valence	2.42 (0.95)	2.42 (0.95)	2.44 (1.15)	2.19 (1.34)	2.22 (1.29)	2.28 (1.06)
Intensity	5.73 (0.78)	5.54 (1.10)	5.67 (1.24)	5.02 (1.20)	4.97 (1.48)	5.17 (1.23)

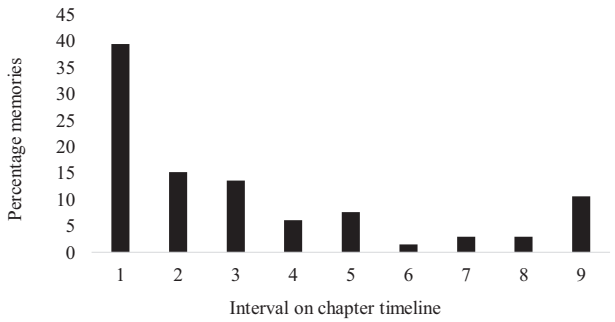

Fig. 1. Placement of wedding memory within the chapter across all participants (Study 1). Note that data were binned with 1 = 0–10 mm, 2 = 10.1–20 mm, etc.

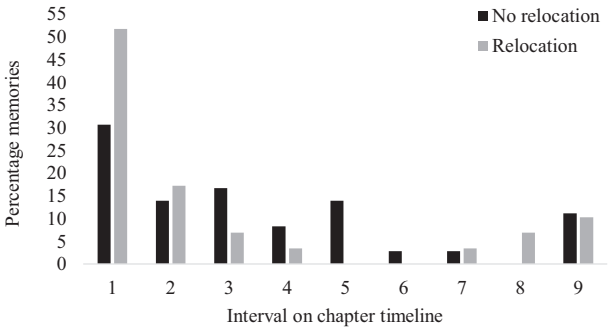

Fig. 3. Placement of wedding memory within the chapter for participants relocating in relation to marriage or not (Study 1). Note that data were binned with 1 = 0–10 mm, 2 = 10.1–20 mm, etc.

Table 2. *Logistic regressions predicting likelihood of wedding memory located to beginning of chapter from the two material change variables (cohabitation and relocation) and their interaction for Study 1 and Study 2*

	Study 1			Study 2		
Predictor	*β*	SE *β*	*p*	*β*	SE *β*	*p*
Cohabitation	0.23	0.29	0.44	−0.68	0.21	<0.001
Relocation	−0.54	0.29	0.06	0.21	0.21	0.30
Interaction	0.15	0.29	0.61	−0.36	0.21	0.08

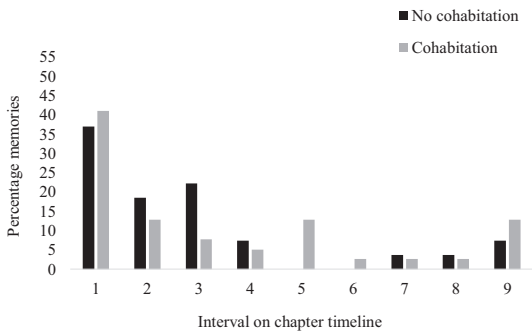

Fig. 2. Placement of wedding memory within the chapter for participants cohabitating prior to marriage or not (Study 1). Note that data were binned with 1 = 0–10 mm, 2 = 10.1–20 mm, etc.

showed only two significant effects of material change group. One was in the opposite direction of expected: belief in recollection differed across the three groups ($H[2] = 7.40$, $p = 0.02$), where the group with one material change scored higher than the group with two material changes ($z = 2.72$, $p < 0.009$); the other post hoc tests did not reach significance (no change compared to one change: $z = -1.30$, $p = 0.12$ and no change compared to two changes: $z = 1.54$, $p = 0.12$). The remaining tests showed no significant effects on AMQ ratings (Kruskal–Wallis $Hs < 1.54$, all $ps > 0.46$). For CES, the direction of the effect was closer to expected ($H[2] = 7.34$, $p = 0.03$). The group with no material change did not differ significantly from the group with one material change ($z = -1.07$, $p = 0.14$), but did differ significantly from the group with two material changes ($z = -2.70$, $p = 0.01$). The one change group did not differ significantly from the two changes group ($z = -1.74$, $p = 0.08$). In sum, while material changes in the form of cohabitation and relocation were generally not associated with wedding memories higher on phenomenological experience and metacognitive judgments, more material change in relation to wedding was related to viewing the wedding memory as more central to identity.

Discussion

Study 1 did not support our main hypothesis that individuals who experience more material change in connection with marriage are likely to form a new chapter. However, the sample size is small leaving us unable to detect small-medium effects of material change. Study 2 included a larger sample, and we counterbalanced the tasks of chapter identification and wedding memory recall to exclude the possibility that effects would be due to memory recall priming chapter segmentation. Study 2 was preregistered at [https://osf.io/hj3mg/].

STUDY 2: METHOD

Participants

Using Prolific, participants were tested over the course of 2 days (November 30–December 1, 2020). We aimed to recruit 300 participants as we estimated that this would allow sufficient power to detect small-medium effects. Precise power calculations were not possible, as we could not in advance determine the number of participants in each material change group on Prolific. Rather the material change groups were formed based on participants' responses to the survey.

Based on Prolific prescreening responses to the question "What is your relationship/marital status?" eligible participants had to be "married," "widowed," "divorced," "separated," or "in a civil partnership/civil union or similar" (those who were "single," "in a relationship," "engaged," "never married" or would "rather not say" were excluded). We also excluded participants with an approval rate less than 90. A total of 451 individuals began the study, 134 were returned or timed-out due to Prolific procedures, another 18 were rejected either due to failure of one or both attention checks (see below), leaving 299 participants in the sample (pre-registration and Prolific plans were for 300 participants, however, one participant who should have been rejected due to attention checks was not identified until later). Participants who took 40 min or less to complete the survey were paid $6.60; those who took longer (N = 48) were compensated for their time at a commensurate rate (range of bonus payments was $0.33 to $5.01).

The vast majority of participants (N = 276, 92.3%) were married, with fewer who were divorced (N = 15, 5%), separated (N = 5, 1.7%), or widowed (N = 3, 1%). Similarly, 92% of participants (N = 275) reported only having been married once and of those who had been married more than once, only one had been married more than twice. For those participants, only four described their first wedding for the purposes of the study, the remaining 20 described their most recent wedding. Concerning our proxies for material change, 201 cohabitated before marriage and 98 did not; 150 relocated in connection with marriage and 149 did not.

Age ranged from 20 to 77 years old (M = 40.60, SD = 11.72). The majority self-identified as non-Hispanic (N = 249, 83.3%) and White (N = 239, 79.9%), with roughly equal numbers of men (N = 133, 44.5%, one of whom identified as trans and one who did not complete the trans/cis question) and women (N = 165, 55.2%, all of whom identified as cisgender) and one participant who identified as non-binary. Most participants were highly educated (N = 46, 15.4% with a high school degree or less, N = 43, 14.4% with some college or an associate's degree, N = 109, 36.5%, with a bachelor's degree, and N = 100, 33.4% with a master's, professional, or doctoral degree; and one person declining to answer the question). Participants identified as Christian (N = 144, 48.2%, including Catholic (N = 136), Protestant (N = 66), Orthodox (N = 9) and other denominations (N = 6)) (N = 116, 38.8%) as atheist, agnostic, or nothing in particular, as Muslim (N = 15, 5%), Buddhist (N = 5, 1.7%), Jewish (N = 4, 1.3%), Hindu (N = 2, .7%) or "something else" (N = 9, 3%) with the rest selecting "prefer not to say" (N = 4, 1.3%).

Materials

Materials and procedure were similar to Study 1 with a few exceptions (a copy of the Qualtrics instrument is available at [https://osf.io/hj3mg/]). First, we omitted the dating protocol, the duplicate question asking participants to date their wedding memory, and the question concerning spousal religious affiliation. Second, to adapt the task of placing the wedding memory within the chapter to the online format, we provided participants with a slider marked 0 at one end, 100 at the other end and with 10 equal intervals, asking them to move the slider to indicate the location of the memory within the chapter. Third, we included two attention checks in order to exclude invalid responses.

Procedure

First, participants confirmed their relationship status to determine if they met eligibility criteria. If they did, they were provided with an informed consent consistent with a protocol as approved by the Lafayette College Institutional Review Boards. Then, they were provided with general instructions stating that we were interested in understanding how people remember events from their lives, and we would be asking them to recall events and answer questions about the characteristics of those events and of their memories for them. We asked them to answer as completely and honestly as possible while maintaining anonymity – they were told that they could use initials to represent people or places that they did not wish identified.

The procedure was divided into three tasks from the participants' perspective. One block emphasized memory for a specific event. One task included wedding event recall, both with open-ended and probed recall questions. Next, they answered demographic questions about that event, the AMQ, the TIS, and the CES. A second task included the chapter descriptions. Next, they identified which chapter included the wedding, and when during that chapter (along a timeline) the wedding occurred. The wedding memory and chapter tasks were counterbalanced across participants, except that locating the wedding memory within the chapter was always completed after both recalling the wedding memory and identifying chapters. The final task included demographic information about gender, age, race, ethnicity, education, and religion. Upon completing all tasks, participants were debriefed. After reviewing open-ended responses to ensure they were not gibberish and the two attention checks to ensure they were answered accurately, participants were compensated via Prolific.

Results

A deidentified dataset as well as JASP analysis files and html output are available at [https://osf.io/hj3mg/]. When variables violated the assumption of normality, we report nonparametric tests.

We first examined relations between cohabitation before marriage and relocation to assess associations between our two proxies of material change. Cohabitation was significantly associated with relocation, X^2 (1, N = 299) = 57.73, $p < 0.001$, such that those who cohabitated were less likely to relocate as a consequence of getting married (did not relocate 131 vs. relocated 70), whereas those who did not cohabitate were more likely to relocate (did not relocate 18 vs. relocated 80). Like for Study 1, we then divided our participants into three groups reflecting either no material change (N = 131), one material change (N = 88), and two material changes (N = 80).

In order to test our assumption that cohabitation and relocation were associated with self-reported material change, we examined scores on the TIS by the three material change groups (Table 1). Analysis showed significant differences among the three groups on TIS material change (H [2] = 111.46, $p < 0.001$). Post hoc tests showed that the group with no material change differed significantly from the group with one material change ($z = -7.14$, $p < 0.001$) and the group with two material changes ($z = -9.95$, $p < 0.001$). In addition, the one change group differed significantly from the two changes group ($z = -2.77$, $p = 0.002$). However, for TIS psychological change, there was no significant effect of material change group (H[2] = 3.90, $p = 0.14$). In short, our assumption that relocation and cohabitation would be associated with more material changes was supported. In contrast to Study 1 results, changes in material circumstances were not accompanied by psychological change.

For the chapter task, there was a significant difference in the total number of chapters participants provided as a function of material change group, H(2) = 10.80, $p = 0.004$. Post hoc tests showed that participants who had no change provided significantly more total chapters than did those who had two changes ($z = 3.28$, $p = 0.002$). However, there was no difference in the number of chapters reported between those who experienced no change and one change ($z = 1.49$, $p = 0.09$) or between those who experienced one change vs. two ($z = 1.68$, $p = 0.09$). We had provided space for up to 20 chapters and participants provided as few as one and as many as 10 chapters (M = 2.33, SD = 1.33).

We then examined whether material change would be associated with a higher likelihood of locating the wedding memory to the beginning of the

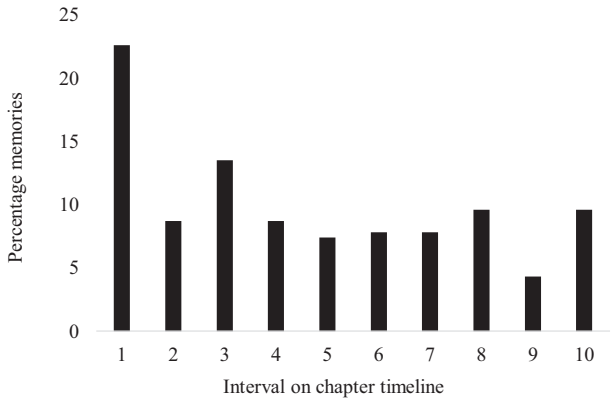

Fig. 4. Placement of wedding memory within the chapter across all participants (Study 2). Note that data were binned with 1 = 0–9, 2 = 10–19, etc.

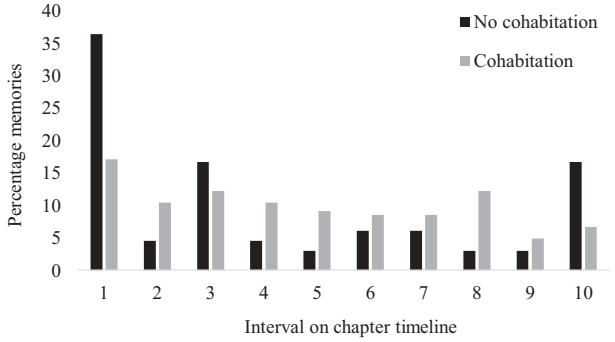

Fig. 5. Placement of wedding memory within the chapter for participants cohabitating prior to marriage or not (Study 2). Note that data were binned with 1 = 0–9, 2 = 10–19, etc.

chapter (69 participants were lost to these analyses due to omissions or misunderstanding of instructions). Across all participants, the wedding memory was more likely to be at the start of the chapter than expected due to chance alone, (X^2 [9, N = 230] = 51.30, $p < 0.001$, Fig. 4). To examine whether the two material change variables predicted locating the wedding memory to the first time bin of the chapter, we conducted a logistic regression. We entered first bin versus all other bins as the outcome variable, and cohabitation, relocation, and their interaction as predictor variables. The overall model was significant χ^2 (226) = 12.66, $p = 0.005$, and not cohabitating before marriage positively predicted placing wedding memories in the first bin (Table 2). To provide an overview of memory location within chapters in relation to material change, we plotted the distribution of wedding memories for individuals with cohabitation versus no cohabitation (Fig. 5) and relocation versus no relocation (Fig. 6). In sum, participants were more likely to locate the wedding memory to the beginning of chapters, and the regression showed that this was significantly related to not cohabitating before the wedding, indicating that material change made it more likely that participants formed a new chapter with the wedding as the starting point.

Finally, we examined the phenomenological and metacognitive aspects of remembering the wedding event in relation to material change (Table 1, see [https://osf.io/hj3mg/] for analyses on delay between wedding event and study participation). Consistent with predictions, there were effects of material change groups on re-experience (H[2] = 6.58, $p = 0.04$; no change vs. one change, $z = -1.56$, $p = 0.12$; no change vs. two changes, $z = -2.48$, $p = 0.02$; and one change vs. two changes, $z = -0.89$, $p = 0.19$), belief in recollection (H[2] = 8.76, $p = 0.01$; no change vs. one change, $z = -0.12$, $p = 0.45$; no change vs. two changes, $z = -2.77$, $p = 0.008$; and one change vs. two changes, $z = -2.43$, $p = 0.01$), significance (H[2] = 8.82, $p = 0.01$; no change vs. one change, $z = -1.27$, $p = 0.11$; no change vs. two changes, $z = -2.97$, $p = 0.004$; and one change vs. two changes, $z = -1.59$, $p = 0.11$), and CES (H[2] = 16.13, $p < 0.001$, no change vs. one change, $z = -2.71$, $p = 0.006$; no change vs. two changes, $z = -3.79$, $p < 0.001$; and one change vs. two changes, $z = -1.06$, $p = 0.14$). In sum, material changes were related to wedding memories with higher re-experience, belief in recollection, significance, and centrality to identity.

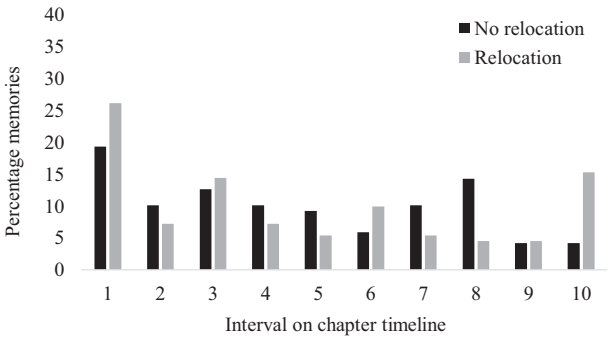

Fig. 6. Placement of wedding memory within the chapter for participants relocating in relation to marriage or not (Study 2). Note that data were binned with 1 = 0–9, 2 = 10–19, etc.

GENERAL DISCUSSION

We found some support for our main hypothesis that individuals who experienced more material change in relation to their wedding were more likely to form a new chapter with the wedding as the starting point. In both studies, participants were more likely to locate the wedding memory to the beginning of the chapter, but only in Study 2 was this significantly related to material change (in the form of cohabitation, but not relocation). Study 1 may have been underpowered to detect effects, indicating that Study 2 results should be emphasized. Still, numerical values for cohabitation in Study 1 did not indicate a strong effect of cohabitation. The mixed results may reflect individual differences in degree of material change captured in our proxies of cohabitation and relocation. For example, cohabitation may be a larger change for someone who has spent less time with the spouse-to-be before the wedding. Future research could probe this further by recruiting large samples of non-cohabiting individuals and examine whether high versus low self-reported material change is related to a greater likelihood of placing wedding memories at beginning of chapters.

Critics may argue that the chapter methodology utilized in the present study led participant to identify more loosely defined chapters and that this explains the mixed findings. However, given that marriage often shows up as a chapter in life stories (Thomsen *et al.,* 2017) and that relocation is a prototypical example of material change, we would argue that the chapters that wedding memories were located to represent well-defined and consolidated temporally extended autobiographical memory. Our mixed findings should be viewed in connection with studies indicating that change in material circumstances followed by stability offset the formation of autobiographical periods (Shi & Brown, 2016; Uzer & Brown, 2015). Together these studies

indicate that change in material circumstances is involved in the construction of chapters. However, other processes could also be involved, partly explaining the mixed findings in our studies. Reviewing the literature, Thomsen (2015) suggested that culturally shared knowledge about periods in life as well as goals may shape the formation of chapters. Furthermore, memory conversations may scaffold the construction of chapters (Leichtman, Steiner, Camilleri, Pillemer & Thomsen, 2019). Culturally shared ideas that marriage is the start of a new life chapter, a personal goal to be happily married, and labeling the wedding as beginning a chapter may scaffold thinking about marriage as a new chapter in life even when few material changes occur. This would be consistent with studies showing that the cultural life script, that is, culturally shared knowledge about the types and timing of important life events, shape the retrieval of specific memories (Berntsen & Rubin, 2004; Bohn, 2010).

We also found mixed support for the expected differences on characteristics of wedding memories between the groups experiencing more or less material change. In Study 1, only one effect was significant and in the opposite direction of expected. In Study 2, three of six effects reached significance, and one of these effects was in the opposite direction of the Study 1 effect. Given that this prediction rested on the assumption that wedding memories would serve as starting points offsetting a new chapter for the high material change groups and we did not consistently confirm this effect, the mixed findings for differences in memory characteristics is less surprising. Still, across both studies centrality to identity was higher for individuals with more material change, suggesting that such changes may impact which personal memories become key to identity.

While the present study is the first to directly examine the formation of chapters in relation to naturally occurring variation in change of material circumstances, there are limitations to the study. First, the sample size for Study 1 was relatively small as it was challenging to recruit individuals who had not cohabitated before marriage. This problem, however, was addressed in Study 2. Second, establishing whether wedding memories were the starting points of new chapters was assessed with a single task where participants placed the wedding memory on a timeline representing the chapter. Although this method has been used in other studies (Thomsen & Berntsen, 2005), a more thorough examination of whether the wedding offset the formation of a new chapter would be desirable. Third, the samples were generally highly educated and oversampled White and Christian individuals. Future studies could seek to replicate the results in other demographic groups.

In conclusion, the present findings provide some indication that material change in the form of cohabitation is involved in the formation of chapters, although more studies are needed as results were not consistent. The study contributes to expanding the knowledge base on a memory phenomenon that has received little attention so far. Given that chapters are an important part of natural remembering and central to constructing coherent life stories, knowledge on chapters facilitate our understanding of how memory works in everyday life.

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REFERENCES

Barsalou, L.W. (1988). The content and organization of autobiographical memories. In U. Neisser & E. Winograd (Eds.), *Remembering reconsidered: Ecological and traditional approaches to the study of memory* (pp. 193–243). New York: Cambridge University Press.

Berntsen, D. & Rubin, D. C. (2004). Cultural life scripts structure recall from autobiographical memory. *Memory and Cognition*, *32*, 427–442.

Berntsen, D. & Rubin, D. C. (2006). The centrality of event scale: A measure of integrating a trauma into one's identity and its relation to post-traumatic stress disorder symptoms. *Behaviour Research and Therapy*, *44*, 219–231.

Bohn, A. (2010). Generational differences in cultural life scripts and life story memories of younger and older adults. *Applied Cognitive Psychology*, *24*, 1324–1345.

Bohn, A. & Habermas, T. (2016). Living in history and living by the cultural life script: How older Germans date their autobiographical memories. *Memory*, *24*, 482–495.

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 D. Berntsen & D. C. Rubin (Eds.), *Understanding autobiographical memory. Theories and approaches* (pp. 160–180). New York: Cambridge University Press.

Brown, N. R., Lee, P. J., Krslak, M., Conrad, F. G., Hansen, T. G. B., Havelka, J. *et al*. (2009). Living in history. How war, terrorism, and natural disaster affect the organization of autobiographical memory. *Psychological Science*, *20*, 399–405.

Brown, N. R., Schweickart, O. & Svob, C. (2016). The effect of collective transitions on the organization and contents of autobiographical memory: A transition theory perspective. *American Journal of Psychology*, *129*, 259–282.

Conway, M. A. (2005). Memory and the self. *Journal of Memory and Language*, *53*, 594–628.

Conway, M. A. & Bekerian, D. A. (1987). Organisation in autobiographical memory. *Memory and Cognition*, *15*, 119–132.

Leichtman, M., Steiner, K., Camilleri, K. A., Pillemer, D. B. & Thomsen, D. K. (2019). What happened in kindergarten? Mother-child conversations about life story chapters. *Memory*, *27*, 49–62.

McAdams, D. P. (2001). The psychology of life stories. *Review of General Psychology*, *5*, 100–122.

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.

Rubin, D. C., Schrauf, R. W. & Greenberg, D. L. (2003). Belief and recollection of autobiographical memories. *Memory & Cognition*, *31*, 887–901.

Shi, L. & Brown, N. R. (2016). The effect of immigration on the contents and organization of autobiographical memory: A transition theory perspective. *Journal of Applied Research in Memory and Cognition*, *5*, 135–142.

Steiner, K. L., Pillemer, D. B., Thomsen, D. K. & Minigan, A. P. (2014). The reminiscence bump in older adults' life story transitions. *Memory*, *22*, 1002–1009.

Svob, C., Brown, N. R., Reddon, J. R., Uzer, T. & Lee, P. J. (2014). The transitional impact scale: Assessing the material and psychological impact of life transitions. *Behavior Research Methods*, *46*, 448–455.

Thomsen, D.K. (2009). There is more to life stories than memories. *Memory*, *17*, 445–457.

Thomsen, D. K. (2015). Autobiographical periods: A review and central components of a theory. *Review of General Psychology*, *19*, 294–310.

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., Lind, M. & Pillemer, D. P. (2017). Examining relations between aging, life story chapters, and well-being. *Applied Cognitive Psychology*, *31*, 207–215.

Uzer, T. & Brown, N. R. (2015). Disruptive individual experiences create lifetime periods: A study of autobiographical memory in persons with spinal cord injury. *Applied Cognitive Psychology*, *29*, 768–774.

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