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Looking at the past through a telescope: adults postdated their earliest childhood memories

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ABSTRACT
Our previous studies have consistently shown a telescoping error in children's dating of earliest childhood memories. Preschool children through adolescents systematically date their earliest memories at older ages, in comparison with the age estimates provided by their parents or by themselves previously. In the current study, we examined the dating of earliest childhood memories in two samples of college adults and collected independent age estimates from their parents. Consistent with our findings with children, adults significantly postdated their earlier memories by approximately 12 months (Study 1) and 6 months (Study 2). The actual age of earliest memories was 2.5 years after adjusted for telescoping errors, 1 year earlier than what is commonly believed at 3.5 years. These findings challenge commonly held theoretical assumptions about childhood amnesia and highlight critical methodological issues in the study of childhood memory.

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Childhood amnesia has been a subject of lasting interest among psychologists for over a century. It refers to the common phenomenon where adults typically cannot remember any event from their childhood that took place before they were 3.5 years old on average (Bauer, 2007; Peterson, 2012; Pillemer & White, 1989). Developmental studies have further shown that childhood amnesia can be observed in children as young as age 8 or 9 years and becomes more pervasive as children get older (Cleveland & Reese, 2008; Jack, MacDonald, Reese, & Hayne, 2009; Peterson, Grant, & Boland, 2005; Peterson, Warren, & Short, 2011; Tustin & Hayne, 2010; Wang, 2004). Critically, the most commonly used method for studying childhood amnesia is to examine the age of earliest memory, dubbed as the offset of childhood amnesia. It is considered to be the turning point from which early memories become accessible to conscious recall. The age of earliest memory has served as the basis for major theoretical explanations for childhood amnesia and the development of memory in early childhood more generally (Bauer, 2007; Nelson & Fivush, 2004; Perner & Ruffman, 1995; Peterson, 2012; Pillemer & White, 1989; Wang, 2003). However, recent cross-sectional and longitudinal studies on children's recollection of early childhood have shown that the age of earliest memory is in fact systematically biased in estimate.

Children postdate their earliest childhood memories

In the first study that focused on the accuracy of children's age estimates of early childhood memories, Wang, Peterson, and Hou (2010) asked Chinese and European Canadian 8-, 11-, and 14-year-old children to recall and date memories for events that occurred before they went to school. Children's parents verified each of the memories children recalled and provided independent age estimates for these memories. For the memory events that parents verified as happening before children were 48 months, children dated the memories at significantly older ages than did their parents. In contrast, for the events that parents verified as happening after children were 48 months, children dated the memories at significantly younger ages than did their parents. This pattern was consistent across age and culture groups. Given that the single earliest memories mostly occurred before 48 months (Peterson, 2012; Pillemer & White, 1989; Rubin, 2000; Wang & Peterson, 2014), these memories tend to be postdated.

Notably, studies prior to Wang et al. (2010) had also attempted to verify the dating accuracy of early childhood memories by comparing dating information provided by participants and that provided by parents or other adults who were present at the time of the events (e.g., Bauer, Burch, Scholin, & Güler, 2007; Bruce, Dolan, & Phillips-Grant, 2000; Eacott & Crawley, 1998; Howes, Siegel, & Brown, 1993; Jack et al., 2009). The general conclusion was that there were no systematic dating errors in early childhood memories. The key methodological difference between these studies and Wang et al. (2010) is that in these studies, the *mean* age estimate provided by participants was compared against the *mean* age estimate provided by parents, whereas in Wang et al. (2010),

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children's dating of each memory was verified against the dating information provided by parents. Indeed, the mean age estimates provided by children and by parents were almost identical in Wang et al. (2010), just as in prior studies. Because children postdated earlier memories and predated later memories, these two trends largely cancelled each other out, so that calculations of mean ages of children's memories by children vs. parents ended up being almost identical.

Wang and Peterson (2014) subsequently conducted two prospective studies to examine children's recall and dating of their earliest memories for the same events longitudinally, at two different time points. They asked 4–13-year-old children to recall and date their three earliest memories at two time points, with a 1-year (Study 1) or 2-year interval (Study 2). It was found that across all age groups, children postdated their memories to significantly older ages at the follow-up interview, particularly for memories initially dated from earlier years of life. Thus, although children continued to remember many of the same events as their earliest memories, the location in time of the memories shifted to an older age as time went by.

Then, in a further 8-year longitudinal study with a group of 4–9-year-old children, Wang and Peterson (2016) examined children's recall and dating of their earliest memories at three time points: an initial interview, a 2-year follow-up, and an 8-year follow-up. They found that earliest memories continued to be postdated many years following the previous recalls and that the magnitude of postdating was especially sizable for earlier memories and among younger children. Importantly, many early memories were forgotten as children got older, consistent with the findings of other longitudinal studies (Jack et al., 2009; Peterson et al., 2005, 2009; Tustin & Hayne, 2010). Yet, for the memories that children continued to remember, the dating of the memories shifted upward in time. Based on these findings, Wang and Peterson (2014, 2016) suggest that the postdating of earliest childhood memories may eventually result in a period of childhood "amnesia" from which no memories are dated, instead of no memories available for recall. They further suggest that the postdating of earliest childhood memories may reflect the general cognitive bias of telescoping error.

The telescoping error

When people recall and date distant memories from a period of their lives (e.g., the first semester at college, or the past 6 months), older memories tend to be postdated, whereby the events are thought to have happened more recently than they actually have (Janssen, Chessa, & Murre, 2006; Loftus & Marburger, 1983; Rubin & Baddeley, 1989; Thompson, Skowronski, & Lee, 1988). This phenomenon is termed *telescoping*, as it resembles the situation where an object seems closer in distance when viewed through a telescope. On the other hand, a reverse telescoping effect is often observed with more recent memories from the same period, whereby events are thought to have happened earlier or in a more distant past than they actually have and, as a result, they tend to be predated. These dating errors eventually cause the estimated dates to move toward the middle of the target period (Janssen et al., 2006; Loftus & Marburger, 1983; Rubin & Baddeley, 1989; Thompson et al., 1988).

Importantly, information about "when" of an event is not always encoded with information about "where" and "what", but often reconstructed at the time of recall (Brewer, 1988; Brown, 1990; Thompson, Skowronski, Larsen, & Betz, 1996). Retention has been shown to be a critical determinant for the accuracy of event date estimation (Betz & Skowronski, 1997; Thompson et al., 1996). Thus, although the mechanism underlying telescoping and reverse telescoping is not entirely clear, there have been proposals that the incomplete retention of memories as a result of elapsed time may contribute to such imprecision in memory dating (Huttenlocher, Hedges, & Prohaska, 1988; Janssen et al., 2006; Rubin & Baddeley, 1989). Because all the events being dated have presumably happened during the target period (e.g., the first semester at college, or the past 6 months), whenever dating errors occur, older events are generally postdated (i.e., telescoping) and more recent events are generally predated (i.e., reverse telescoping) so that the recollected dates would fall in the requested period. Furthermore, because older events tend to be less well retained, the magnitude of dating errors for these events tend to be more pronounced, when compared with more recent events.

Our findings with children's age estimates of early childhood memories are consistent with this literature: When recalling events from the period of early childhood, preschool children through adolescents exhibited telescoping errors by postdating their earliest memories to older ages (Wang et al., 2010; Wang & Peterson, 2014, 2016), and exhibited reverse telescoping errors by predating their later memories to younger ages (Wang et al., 2010), in comparison with the age estimates provided by their parents or by themselves previously. The largest errors showing telescoping occurred for those memories that were children's earliest. Note that children may be particularly vulnerable to the dating errors due to their limited knowledge of time and memory dating strategies (Friedman, 2005; Scarf, Boden, Labuschagne, Gross, & Hayne, 2017). Nevertheless, given the relatively low accessibility and ease of interference of childhood memories (Bauer et al., 2007), it is possible that the same telescoping errors are present in adults' estimates of their age at the time of their earliest memories too. This would call into question the age of earliest memories commonly reported in the childhood amnesia literature. The present study set out to examine this question.

The present study

We examined the dating of earliest childhood memories in two samples of college adults and obtained independent age estimates from their parents. Participants reported their five earliest memories and estimated their ages at the time of the events. They further rated the characteristics of these memories (i.e., valence, vividness, personal significance, biographical importance). Parents were contacted via phone or email to verify these memories and to provide independent dating estimates.

Notably, although the memory dating information provided by parents is far from being an objective measure of veracity, there are a number of reasons why parents would provide more accurate age estimates of their children's childhood memories than children themselves. First, their children (now young adults) are recalling memories from their very earliest years, a period when children are typically first able to demonstrate long-term verbal recall of complex events (Bauer, 2007). In contrast, these memories date from the adulthood of parents whose memory has fully developed. Second, participants are recalling memories from a time when memories are scarce and typically fragmentary, whereas parents are recalling memories from a period of their lives that is likely to have high personal significance. Therefore, parents may retain and utilise more memory details as well as a multitude of memories to reconstruct event dates. Finally, parents have an additional advantage over their children for memory dating, whereby they can utilise the observable developmental differences in children's behaviour at various ages to inform their date reconstructions.

Following previous studies (Wang et al., 2010; Wang & Peterson, 2014), we used 48 months, the approximate median age estimate, as the cut-off point to examine participants' dating of earlier and later childhood memories. In line with our findings with children (Wang et al., 2010; Wang & Peterson, 2014, 2016), we expected the adult participants to exhibit telescoping errors in dating their earlier memories (before 48 months) and reverse telescoping errors in dating their later memories (after 48 months), when compared with the dating information provided by their parents. We further expected this pattern of results to persist, regardless of the characteristics of the memory events.

Study 1

Participants

A sample of 32 college students (22 females, 10 males; *M* age = 20.49, *SD* = 1.25) at Cornell University and their parents participated. They were part of a larger study on the strategy and accuracy of dating early childhood memories. All participants whose parents provided verifications of their memories were included in the current sample. The sample was ethnically diverse, including 18 (56.25%) Caucasian, 4 (12.5%) Asian, 4 (12.5%) Hispanic, 2 (6.25%) Black, and 4 (12.5%) other ethnic groups. All participants were proficient in English. They received course credits for their participation. Parents participated on a voluntary basis.

Procedure

Participants were individually interviewed in the lab by trained research assistants. The interviews were digitally recorded and later transcribed. After participants provided informed consent, the interviewer asked them to recall their five earliest memories in as much detail as possible, starting with what they would consider their very earliest memory. For each recollection, the interviewer followed up with standard prompts, "What else can you remember about this time?" and then, "Is there anything else?".

After completing the recall of all five memories, participants were asked to estimate the date of each event in month and year. They were instructed to verbalise their thoughts while dating the memories, thinking aloud as they tried to figure out when each event occurred. It was emphasised that participants should verbalise all their thoughts, regardless of how important or unimportant those thoughts might seem. The interviewer gave participants a prompt for each memory they recalled earlier (e.g., "Your earliest memory was X"), and then remained silent while participants engaged in the dating task. The recording ended after the last memory was dated.

Participants were then asked a number of questions regarding their memories and the interviewer took notes of their responses. They were first asked about their emotions at the time of each recalled event, which were categorised as positive, negative, neutral, or mixed. They then rated various characteristics of each memory on 7-point Likert scales, including vividness (1 = *very vague*, 7 = *very vivid*), personal significance (1 = *definitely not important*, 7 = *definitely important*), and biographical importance. For biographical importance, participants were instructed to imagine that they were famous and someone was writing a biography to tell their life story and then rate how likely they were to include each memory in that biography (1 = *definitely wouldn't include*, 7 = *definitely include*). Participants were further asked whether they had experienced a number of common landmark events before the age of 8. These data address separate research questions and were not included here. The entire interview took approximately 45 min.

Parents were contacted via phone or e-mail and provided informed consent either orally or in writing. They were given a brief summary of each of the memories recalled by their children (e.g., "Went to the mall with father the day younger sister was born"). These minimal descriptions provided no details of the memories beyond those necessary to pinpoint a particular event. For each memory, parents were asked whether it had occurred to their knowledge or, if they did not know for sure, whether it was a reasonable event. They were further asked to date each memory to the nearest year and month.

Results

A total of 160 memories were collected. Among the memories, 83% were confirmed by parents to have happened, 17% were deemed to be reasonable, and none was disputed. These results are consistent with previous studies that verified early childhood memories recalled by children or adults (e.g., Bauer et al., 2007; Bruce et al., 2000; Eacott & Crawley, 1998; Peterson, Wang, & Hou, 2009). The age estimate for each memory was calculated in months for both participants and their parents. If the age spanned a range of months, the midpoint for that range was used as the participant's age at the event. The memory that was the earliest according to the ages that the participants identified was selected as their first memory. This could be the memory that participants had explicitly identified as their first memory, or if one of their other memories occurred at a younger age, it was selected instead. Gender showed no effect on any variable in preliminary analysis and was not considered further.

The average ages of all five memories reported by participants ($M = 60.75$ months, $SD = 25.41$) and parents ($M = 56.05$, $SD = 27.28$) were not significantly different, $F(1, 131) = 1.98$, $p = .16$, $\eta_p^2 = 0.02$. Similarly, the average ages of the first memory reported by participants ($M = 41.41$ months, $SD = 15.37$) and parents ($M = 44.13$, $SD = 20.24$) did not differ significantly, $F(1, 29) = 1.79$, $p = .19$, $\eta_p^2 = 0.06$.

Following prior research (Wang et al., 2010; Wang & Peterson, 2014, 2016), memories were roughly medium split into those dated before 48 months (48.50%) and those dated after 48 months (51.51%) to index the age at encoding, based on parents' age estimates. The difference between participants' and parents' age estimates (i.e., participants' dating – parents' dating) was used to index the dating error. A mixed model analysis was conducted on the dating error of all five memories, with the age at encoding (i.e., before vs. after 48 months) being a within-subject factor and subject being a random factor. A significant main effect of age at encoding emerged, $F(1, 115) = 32.78$, $p < .0001$, $\Delta R^2 = 0.18$. Memories of younger age at encoding (i.e., before 48 months) were postdated for almost 12 months (for participants, $M = 48.38$, $SD = 17.54$; for parents, $M = 36.50$, $SD = 8.55$), $F(1, 63) = 36.96$, $p < .0001$, $\eta_p^2 = 0.37$, whereas memories of older age at encoding (i.e., after 48 months) were predated over 6 months (for participants, $M = 67.97$, $SD = 27.80$; for parents, $M = 74.44$, $SD = 26.04$), $F(1, 67) = 7.70$, $p = .007$, $\eta_p^2 = 0.10$. Thus, there was a telescoping effect for earlier memories and a reverse telescoping effect for later memories (see Figure 1).

Next, we tested the effect of age at encoding on the dating error of the first memory. Because of the small sample ($n = 32$; 67% dated before 48 months), memories were not split into two groups by age estimates. Instead, the age at encoding based on the age estimates of parents was entered as a continuous variable into a regression model to predict the dating error. A significant effect emerged, $B = -0.47$, $SE = 0.10$, $t = -4.60$, $p < .0001$. As the age at encoding increased, the dating error changed from primarily positive values (i.e., postdating)

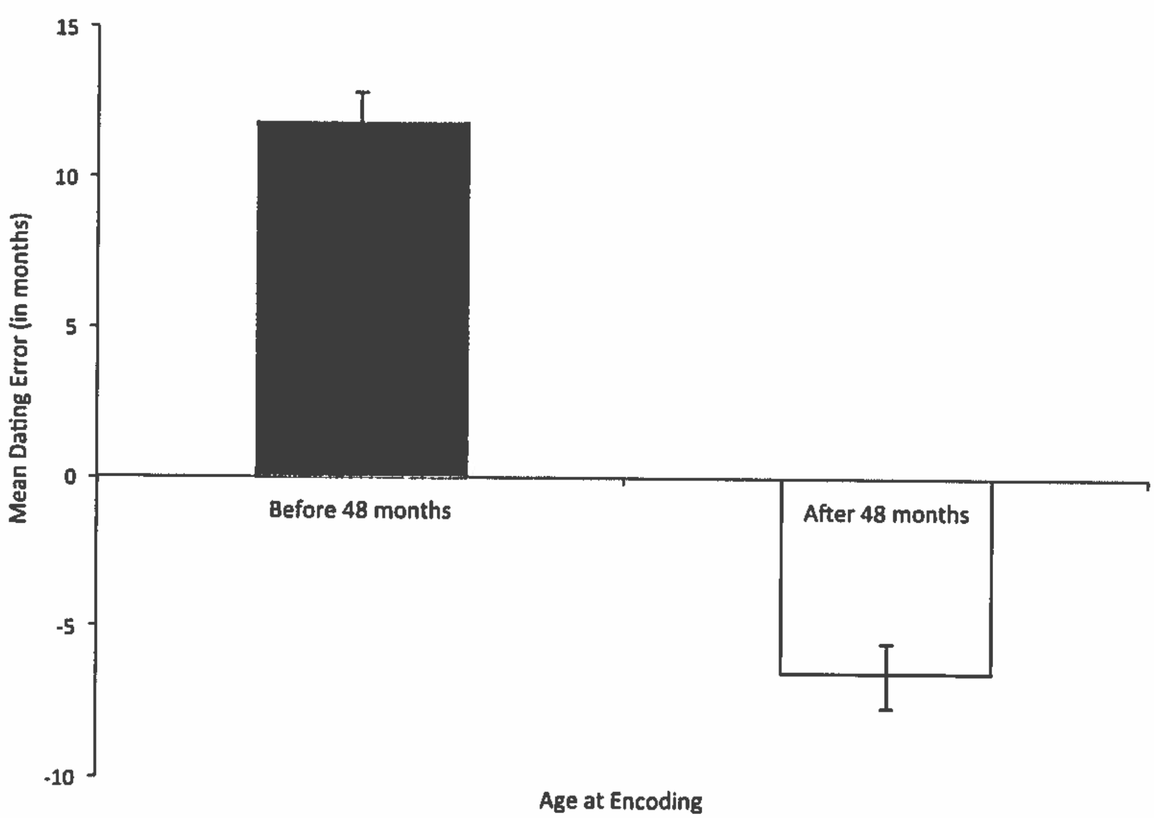

Figure 1. Dating error as a function of age at encoding (before and after 48 months) across all memories for Study 1.

to primarily negative values (i.e., predating), and among the memories that were postdated, the earliest memories showed largest telescoping errors (see Figure 2).

Additional analyses were conducted by including valence, vividness, personal significance, and biographical importance in the above models as covariates. The pattern of results remained identical: Across all five memories, those before 48 months were postdated and those after 48 months were predated, $F(1, 112) = 29.18$, $p < .0001$, $\Delta R^2 = 0.18$. For the first memory, the dating error changed from primarily telescoping to reverse telescoping as the age at encoding increased, $B = -0.41$, $SE = 0.12$, $t = -3.35$, $p = .003$.

Study 2

Findings from Study 1 thus showed telescoping dating errors for memories from earlier childhood and reverse telescoping dating errors for memories from later childhood. We replicated the findings in another sample in Study 2.

Participants

The sample consisted of 49 college students (39 females, 10 males; M age = 21.37, SD = 2.06) at Memorial University of Newfoundland. They were part of a larger study on the strategy and accuracy of dating early childhood memories. All participants whose parents provided verifications of their memories were included in the current sample. Almost all participants self-identified as Caucasian and all were proficient in English. They either received course credits for their participation or were entered in a draw for a $50 gift card. Parents participated on a voluntary basis.

Procedure

The procedure was identical to that in Study 1.

Results

A total of 245 memories were collected, of which 81% were confirmed by parents to have happened and 18% were deemed to be reasonable. Only 1% ($n = 3$) of the memories were disputed, which were excluded in analysis. These results are consistent with previous findings (e.g., Bauer et al., 2007; Bruce et al., 2000; Eacott & Crawley, 1998; Peterson et al., 2009). As in Study 1, the age estimate for each memory was calculated in months for both participants and their parents, and the memory that was the

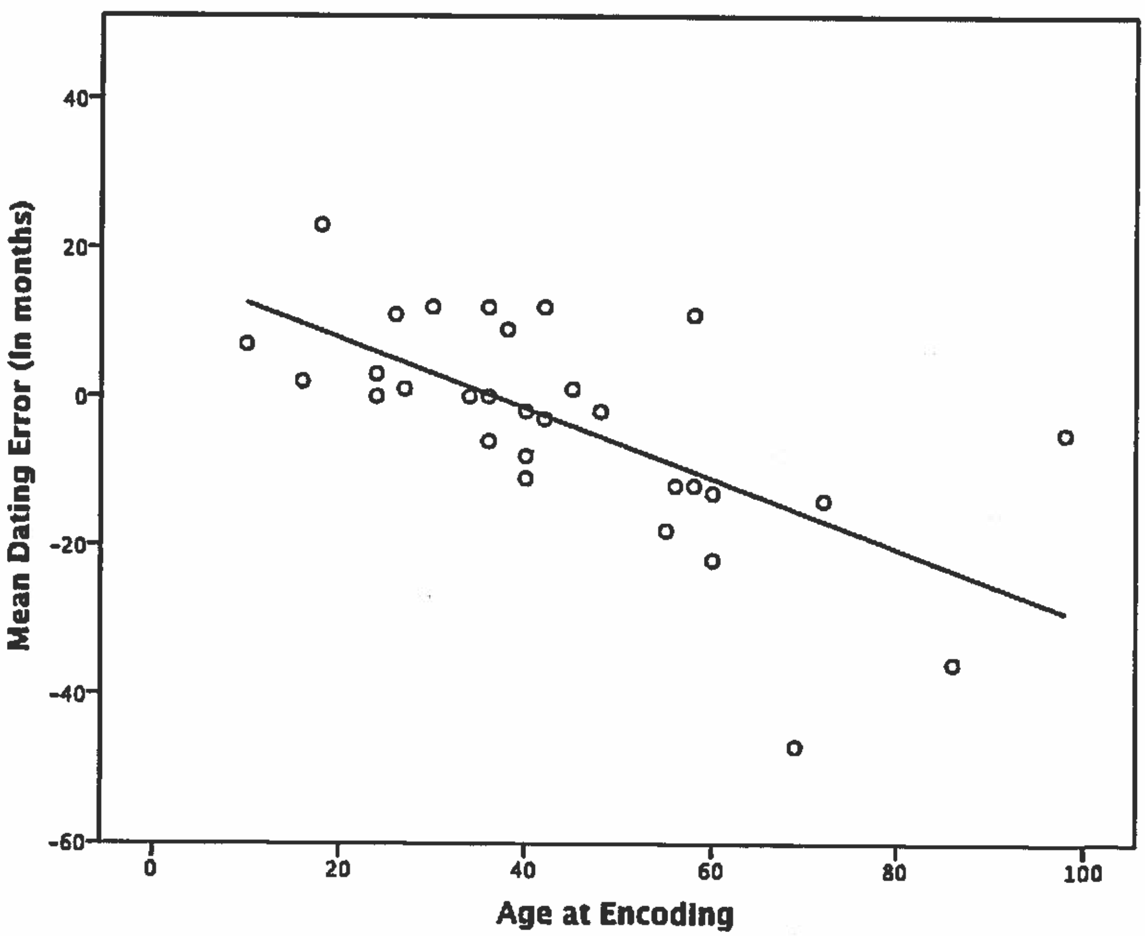

Figure 2. Dating error as a function of age at encoding for the first memory for Study 1.

earliest according to the ages that the participants identified was selected as their first memory. The average ages of all five memories reported by participants ($M = 61.69$ months, $SD = 31.67$) and parents ($M = 58.97$, $SD = 27.70$) were not significantly different, $F(1, 192) = 2.63$, $p = .11$, $\eta_p^2 = 0.01$. Similarly, the average ages of the first memory reported by participants ($M = 36.14$ months, $SD = 15.55$) and parents ($M = 40.27$, $SD = 20.74$) did not significantly differ, $F(1, 43) = 2.07$, $p = .16$, $\eta_p^2 = 0.05$.

Memories were divided into those dated before 48 months (41.45%) and those dated after 48 months (58.55%) to index the age at encoding, based on parents' age estimates. The difference between participants' and parents' age estimates for each memory was calculated to index the dating error. A mixed model analysis was conducted on the dating error of all five memories, with the age at encoding (i.e., before vs. after 48 months) being a within-subject factor and subject being a random factor. A significant main effect of age at encoding emerged, $F(1, 182) = 5.95$, $p = .016$, $\Delta R^2 = 0.04$. Memories of younger age at encoding (i.e., before 48 months) were postdated over 6 months (for participants, $M = 40.09$, $SD = 16.42$; for parents, $M = 34.10$, $SD = 10.09$), $F(1, 79) = 11.81$, $p = .001$, $\eta_p^2 = 0.13$, whereas there was no significant difference between participants' ($M = 76.30$, $SD = 28.38$) and parents' age estimates ($M = 76.58$, $SD = 22.12$) for memories of older age at encoding (i.e., after 48 months), $F(1, 112) = 0.02$, $p = .89$, $\eta_p^2 = 0.00$. Thus, there was a telescoping effect for earlier memories but a reverse telescoping was not significant for later memories (see Figure 3).

Next, we tested the effect of age at encoding on the dating error of the first memory ($n = 49$; 75% dated before 48 months). Again, the age at encoding based on the age estimates of parents was entered as a continuous variable into a regression model to predict the dating error. A significant effect emerged, $B = -0.56$, $SE = 0.09$, $t = -6.06$, $p < .0001$. Consistent with Study 1 results, the dating error changed from primarily positive values (i.e., postdating) to primarily negative values (i.e., predating) as the age at encoding increased, and among the memories that were postdated, the earliest memories showed largest telescoping errors (see Figure 4).

Additional analyses including valence, vividness, personal significance, and biographical importance in the above models as covariates yielded identical patterns of results. Across all five memories, those before 48 months were postdated and those after 48 months showed no significant dating errors, $F(1, 103) = 5.49$, $p = .02$, $\Delta R^2 = 0.06$. For the first memory, the dating error changed from primarily telescoping to reverse telescoping as the age at encoding increased, $B = -0.64$, $SE = 0.20$, $t = -3.23$, $p = .004$.

Discussion

Consistent with our previous findings of children's dating of early childhood memories (Wang et al., 2010; Wang &

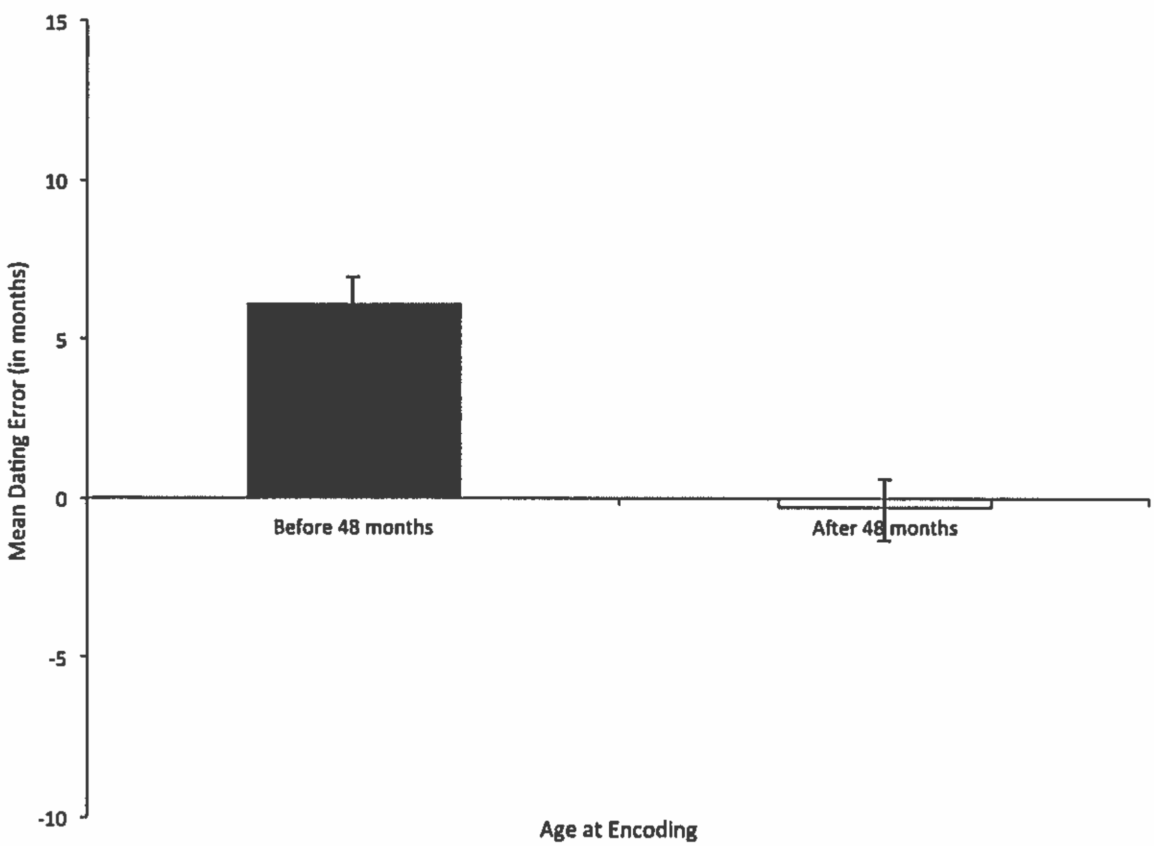

Figure 3. Dating error as a function of age at encoding (before and after 48 months) across all memories for Study 2.

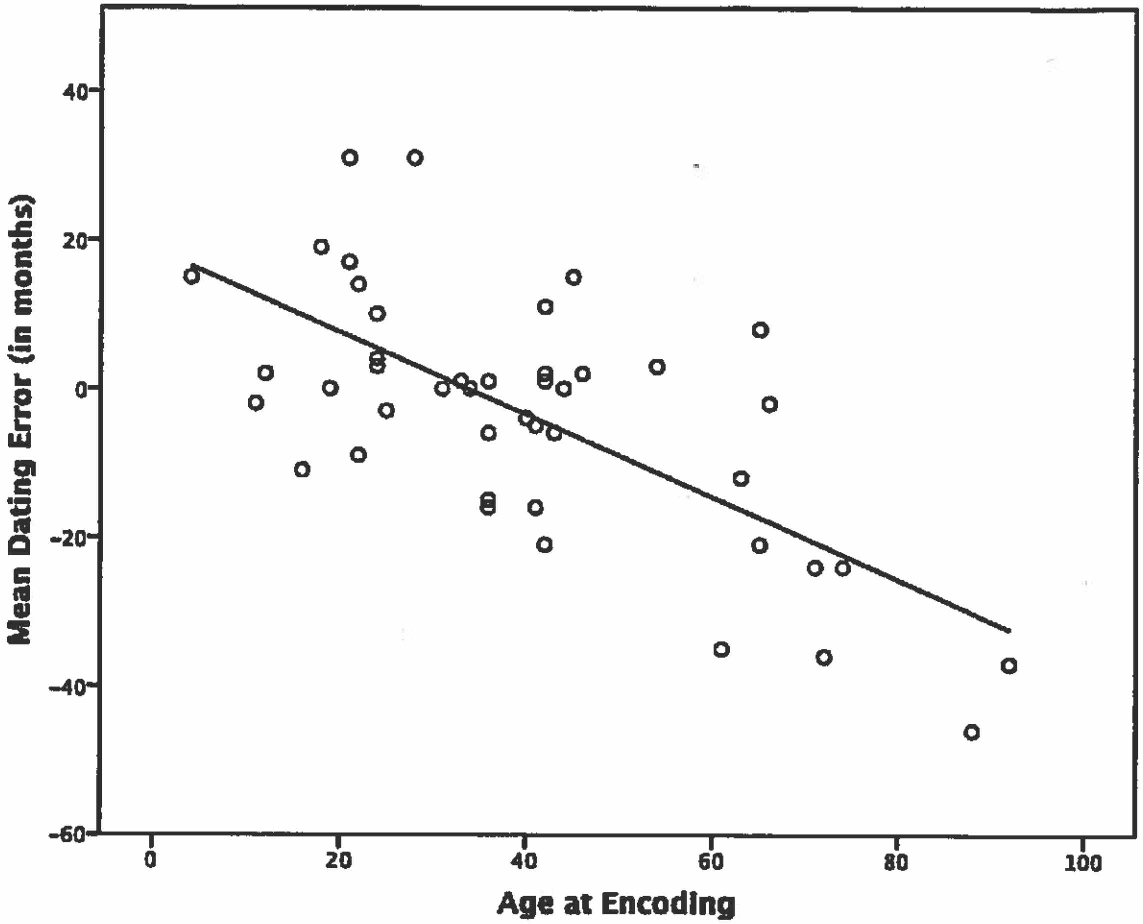

Figure 4. Dating error as a function of age at encoding for the first memory for Study 2.

Peterson, 2014, 2016), adult participants of two independent samples in the current study exhibited telescoping errors when dating memories from earlier childhood (before 48 months), when compared with the dating information provided by their parents. Adults also exhibited reverse telescoping errors when dating memories from later childhood (after 48 months), although the effect was only significant in Study 1. The pattern of results remained regardless of the characteristics of the memory events. The magnitude of dating errors was particularly pronounced for earlier memories, whereby participants postdated these memories for approximately 12 months in Study 1 and 6 months in Study 2. Interestingly, although adult participants of the two samples exhibited different degrees of telescoping errors, their parents dated the earlier memories at about the same age, at 36.5 months in Study 1 and 34.1 months in Study 2. If we assume that the parents' estimates approximate the actual time of occurrence of the events, then the age of earliest memories may indeed be 2.5 years. Alternatively, the average age of the first memory reported by participants was 41.4 months in Study 1 and 36.1 months in Study 2. After adjusting for their respective telescoping errors, the age of the first memory was again approximately 2.5 years for both samples. These findings have critical theoretical and methodological implications for research on childhood amnesia.

One major explanation for childhood amnesia is that over the course of development, early memories decrease in accessibility and eventually become inaccessible. This results in a period of childhood amnesia from which there are almost no memories available to conscious recall (Bauer, 2007; Peterson, 2012). This "forgetting" explanation has received empirical support, whereby many of the early memories indeed become inaccessible or forgotten as children grow older so that there is an increase in the age of earliest memory with increasing age of children (Jack et al., 2009; Peterson et al., 2005, 2009; Tustin & Hayne, 2010). However, our findings have shown that there is a second phenomenon at work too: children continued to remember many of their earliest memories years later and that, more importantly, they postdated the memories to considerably later ages as time passed, which results in an upward shift in the boundary of childhood amnesia over time (Wang et al., 2010; Wang & Peterson, 2014, 2016).

Findings from the current study further add to this body of research by showing that at young adulthood, earliest memories *continued* to be postdated to significantly later ages. They reaffirm our proposal of a "postdating" explanation of childhood amnesia: Some of the earliest memories remain accessible in the course of development, but they are telescoped when recalled at later time points as their retention weakened. This result in a period of "childhood amnesia" from which almost no memories are dated (Wang & Peterson, 2014, 2016). These findings further suggest that the widespread belief about childhood amnesia may be wrong and that adults' earliest memories may occur at approximately 2.5 years, 1 year earlier than the generally assumed average age of 3.5 years (e.g., Pillemer & White, 1989; Rubin, 2000). Theorists of childhood amnesia need to look beyond preschool ages and examine factors in toddlerhood and even infancy that influence memory formation and retention. Potential contributing factors include the development of a sense of agency, non-verbal representational skills, joint attention, and implicit and explicit emotional understanding. In addition, characteristics of an individual's experiences may also play a role in memory development, including multiple retrieval opportunities, the emotional valence of the experience, and the continuity of the early environment.

Methodologically, the current findings point to the importance of examining age estimates of individual memories as a function of age at encoding, rather than comparing group means across all memories. Prior studies that compared the *mean* age estimate provided by participants against the *mean* age estimate provided by parents have failed to identify systematic dating errors and come to the conclusion that the age estimates of earliest memories are generally accurate (e.g., Bauer et al., 2007; Bruce et al., 2000; Peterson et al., 2009). Indeed, the mean age estimates of memories provided by adult participants and their parents in the current study were almost identical as well. These findings are in line with the telescoping literature (Janssen et al., 2006; Loftus & Marburger, 1983; Rubin & Baddeley, 1989; Thompson et al., 1988), whereby memories from earlier childhood were postdated whereas memories from later childhood were predated, which cancelled each other out and caused the estimated dates to fall in the middle. Thus, it is critical in future research of childhood memory to take into consideration the age at encoding when evaluating dating accuracy.

Notably, parents might be subject to dating errors themselves. Just like their children, parents might postdate earlier memories and predate later memories from their children's childhood. If that was the case, the magnitude of actual memory dating errors by young adults might be even larger than what we observed. On the other hand, any dating errors parents made in our study might not be systematic. Parents were simply asked to date the memories that their children had recalled rather than generating and dating memories from a specific time period themselves, a usual condition for telescoping and reverse telescoping to occur (Janssen et al., 2006; Rubin & Baddeley, 1989). Thus, the overall pattern of results should not be affected by the parents' dating errors. Telescoping and reverse telescoping are observed when event date estimates are verified against objective measures such as dates recorded in diaries (Betz & Skowronski, 1997; Janssen et al., 2006). Nevertheless, future research should identify other means of verifying dating accuracy for early childhood memories.

In addition, it is interesting to note that although our two independent samples yielded similar patterns of results, participants in Study 1 exhibited larger telescoping and reverse telescoping errors than did participants in Study 2. We speculate that this might be due to the fact that the Study 1 sample was ethnically diverse whereas the Study 2 sample was composed of primarily Caucasians. The small number of participants in each ethnic group in Study 1 did not warrant reliable analysis of ethnicity. Yet inspection of the means showed that all groups showed telescoping for earlier memories and reverse telescoping for later memories, but the magnitude of errors varied across groups. The telescoping error was 8.00 months for Caucasians and 6.63 months for Asians, comparable with the Study 2 sample. This is also consistent with Wang et al.'s (2010) finding that European Canadian and Chinese children exhibited similar telescoping errors for their earliest memories. Of particular interest, the telescoping error was 26.58 months for Hispanics, 35.5 months for Blacks, and 5.29 months for others ethnic groups. Thus, Hispanic and Black participants appeared to have markedly larger telescoping errors than did Caucasians and Asians. These cultural differences, if confirmed, may reflect different retentions or memory dating strategies across groups. Given that culture plays an important role in childhood recollections and autobiographical memory development (for reviews, see Wang, 2003, 2013), it will be extremely important to study these ethnic groups in future research.

In sum, the present study yielded critical findings that even at adulthood people continue to postdate their earliest childhood memories to considerably later ages, and thus, postdating of earliest memories is not just found with children. It appears as if people are looking at their earliest childhood experiences through a telescope so that those experiences feel closer in time. The distortions in memory dating may have led to erroneous conclusions about when our earliest memories occurred, which has far-reaching theoretical and methodological implications.

Disclosure statement

No potential conflict of interest was reported by the authors.

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