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Fictional First Memories



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Abstract

In a large-scale survey, 6,641 respondents provided descriptions of their first memory and their age when they encoded that memory, and they completed various memory judgments and ratings. In good agreement with many other studies, where mean age at encoding of earliest memories is usually found to fall somewhere in the first half of the 3rd year of life, the mean age at encoding here was 3.2 years. The established view is that the distribution around mean age at encoding is truncated, with very few or no memories dating to the preverbal period, that is, below about 2 years of age. However, we found that 2,487 first memories (nearly 40% of the entire sample) dated to an age at encoding of 2 years and younger, with 893 dating to 1 year and younger. We discuss how such improbable, fictional first memories could have arisen and contrast them with more probable first memories, those with an age at encoding of 3 years and older.

Keywords

first memories, age at encoding, age at retrieval, childhood amnesia, fictional memories, narrative memories, open data

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In many studies of the recall of earliest memories, the first memory is found to date to the 3rd year of life, typically about 3 years 4 months (Hayne, 2004; Kingo, Berntsen, & Krøjgaard, 2013; Pillemer & White, 1989; Rubin, 2000; Wang, Conway, & Hou, 2004). However, also in many studies, there are always a few respondents who date their earliest memory to 2 years of age and below (Hayne, 2004; Wells, Morrison, & Conway, 2014; see also Kingo, Berntsen, & Krøjgaard, 2013). Indeed, there is some evidence that distinctive family events, such as the birth of a sibling, might lead to the formation and long-term retention of unusually early first memories (Eacott & Crawley, 1998; Usher & Neisser, 1993; but for a critique of the validity of such “memories,” see Gross, Jack, Davis, & Hayne, 2013; Loftus, 1993). Here, we had the unique opportunity to sample a large group of adults across the life span and to examine first memories in groups not usually sampled, as previous studies typically have used only young adults.

Interestingly, the study of memory development similarly dates the emergence of first memories to the

age of about 3 to 4 years. Howe, Courage, and Edison (2003), in their review of this research, concluded that the processes underlying the ability to form autobiographical memories are functional by the 3rd year of life, but they also note that other factors, including sociolinguistic development, may further lengthen the period during which full autobiographical memories form (see also Bauer, 2007, 2015, and Howe, 2011a, for recent reviews that reach similar conclusions). In one of the only experimental studies, Simcock and Hayne (2002) found that children exposed to an interesting and novel event below the age of 3 years showed signs of preverbal memory yet failed to translate the memory into language both 6 months and 1 year later. Results suggest that no enduring autobiographical memory of the target event was formed in the first place, or

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possibly, no memory that could be declaratively reported was formed. The obvious implication is that if children below the age of 2 to 3 years cannot form full autobiographical memories, it is not possible for adults to recall such memories from these ages.

Consistent with the findings from the study of the development of memory are the outcomes from studies of young adults recalling first memories. These variously date the emergence of first full autobiographical memories to somewhere between the ages of 3 to 5 years. Rubin (2000), in a meta-analysis of over 11,000 early memories recalled by adults, found the emergence of memories to date to about 3.4 years of age, with virtually no memories falling below the age of 3. Moreover, of the 770 respondents who contributed memories to this review, more than 76% (590) were younger than 30, meaning that the findings are limited to a comparatively young population (largely undergraduate university students). In contrast, Bruce, Dolan, and Phillips-Grant (2000) found full first autobiographical memories to date to 5 to 6 years of age and term “memories” below this age “fragments” that were not recollectively experienced when recalled. But even with fragments, very few dated to below the age of 3 years. The overwhelming evidence and theory is then that full earliest autobiographical memories do not emerge before about the age of about 24 to 36 months, and, if anything, the onset of full autobiographical memories may not be until later than this.

In the present study, we conducted the first large-scale web-based survey of *first* memories (rather than the more general category of *early* memories used in many previous studies; see Rubin, 2000). Thus, the key variable in the present study was respondents' estimates of their age when their first memory was formed: age at encoding.¹ Moreover, because this was a large-scale study, we were able to sample across the full age range and draw on the general population. Uniquely, the survey was linked to a popular series of radio programs on memory produced and broadcast by the British Broadcasting Corporation (BBC) Radio 4 in the United Kingdom (the programs can be listened to at <http://www.bbc.co.uk/radio4/memory/listenagain/>). The survey is no longer live, but the questionnaire that was used is included in the Supplemental Material available online.

Method

In the first program of the radio series, the fourth author introduced the idea that the program would conduct a memory survey of various types of memories (earliest, self-defining, and flashbulb memories) and report the results of the survey in a later program. The audience

was invited to log in to a memory website hosted by the BBC that contained various sources of information about memory and separate questionnaires for each of the three types of memories to be sampled. The questionnaires always began with an information page outlining key instructions regarding the nature of the to-be-sampled memory and an informed-consent box to be checked, and minimal demographic data were collected. Respondents were also informed that after recalling their earliest memory, they would be asked to answer some questions about the memory. For these questions, they were instructed not to guess or infer answers but to answer only if they actually remembered the answer.

Respondents then moved to the next page of the questionnaire proper. They were instructed to recall and then type a title and description (in the box provided) of their very earliest memory. The title was to be only a few words in length but of sufficient specificity that if they read it again, it would remind them of the memory they had recalled. The memory description was to be about a paragraph or so in length. The memory itself had to be one that they were certain they remembered. It should not be based on, for example, a family photograph, family story, or any source other than direct experience. The memory had to be for a specific one-off event that lasted no longer than minutes or hours. It was specifically emphasized that the memory should not be of a routine or repeated event. After entering the title and memory description, respondents were then asked to enter, in years, the age they believed they were in the memory. Following this, the respondents answered a series of questions regarding the recollective qualities of the memory (see the Supplemental Material for details).

Results

There were 6,671 respondents who completed the survey. Inspection of the memory descriptions led to 166 responses being judged unusable because the memory description was vague and lacked any specificity or because it was explicitly stated that it was based on a family story or photograph. Further, 39 memories reportedly encoded over the age of 15 years were not used because of their unusually late age at encoding, and finally, respondents who gave their age group as 0 to 5 ($n = 4$) or 6 to 10 ($n = 21$) were removed because of very low age (which were likely typographical errors). Thus, a total of 6,441 memories were used, and of these, 4,115 were from female respondents (63.9%; mean age = 42.12 years, 95% confidence interval, CI = [41.61, 42.6]) and 2,326 were from male respondents (36.1%; mean age = 41.56 years, 95% CI = [40.89, 42.22]).

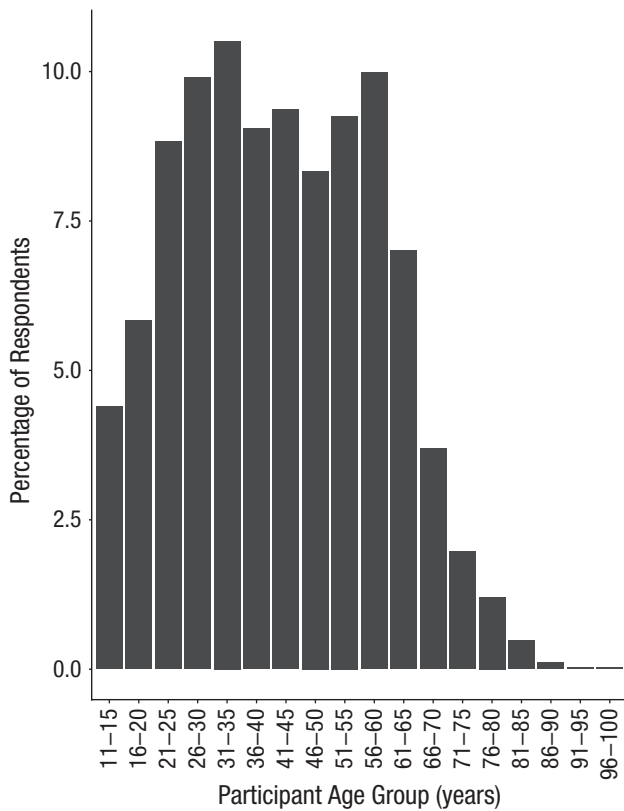


Fig. 1. Percentage of respondents across age groups.

Of the respondents, 82% (5,550) were UK nationals, and the remaining 13.8% (891) resided in other parts of the world. Figure 1 shows the distributions of memories across age groups of respondents and shows clearly that memories were sampled across the life span.

Figure 2 shows the frequency of age at encoding across the sample.² What is immediately evident in Figure 2 is that there were a large number of unexpectedly early memories, with 38.6% (2,487) of the sample having what we term *improbably early* memories, dating to 2 years and younger ($M = 1.64$, 95% CI = [1.62, 1.66]); 52.3% (3,371) reporting what we term *probable* memories, falling between age at encoding of 2 and 5 years ($M = 3.65$, 95% CI = [3.62, 3.67]); and the remaining 9.1% (583) reporting an age at encoding of 6 or more years ($M = 7.72$, 95% CI = [7.55, 7.90]), which we term *improbably late* memories.

Thus, the age at encoding of most memories fell in the predicted range, 2 years to 5 years old; however, the second largest group of memories had ages at encoding that were unexpectedly early, falling in the period of 2 years and less, and these were greater in number than improbably late memories dating to 6 years and older. Despite this unexpected distribution, the overall mean age at encoding of the whole sample was 3.24 years (95% CI = [3.19, 3.29]), which compares favorably with previous findings of the mean age of the earliest memory that place it in the first half of the 3rd year of life.

Next, we investigated whether age at encoding varied as a function of respondent age. In particular, we wanted to determine whether the age at encoding reported in most earliest-memory studies is somewhat skewed as a result of the sampling of younger adults. The sample was therefore split into two new groups: a younger group comprising respondents within the 11–15, 16–20, and 21–25 age groups ($n = 1,228$), similar to the majority of participants sampled in Rubin’s (2000

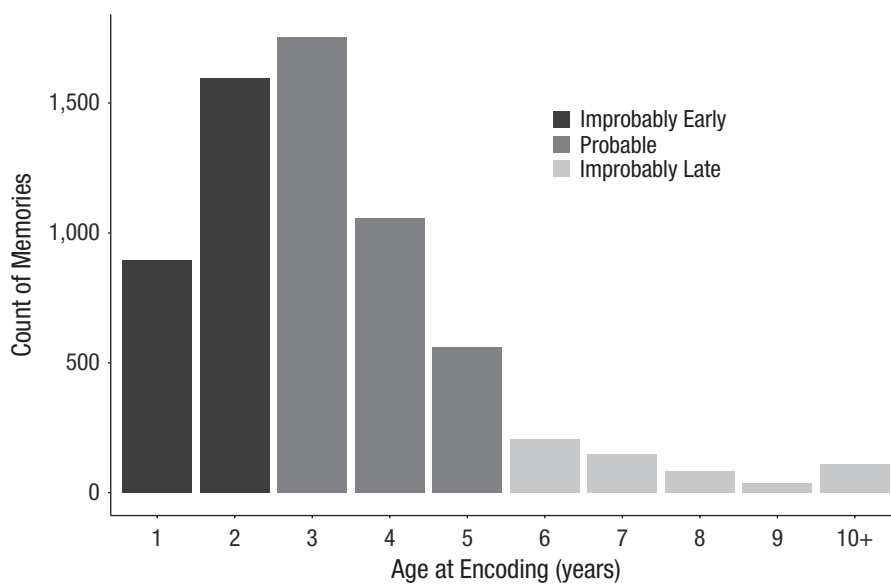


Fig. 2. Frequency of age at encoding grouped by memory type.

Table 1. Percentage of Memories Within Each Semantic Category Across Memory Types

Memory type and category	Percentage of memories	Example
Improbably early		
Pram (baby carriage)	52	I was lying in my pram . . .
Family relationships	30	My parents were going on holiday and me and my elder sister . . .
Feeling sad	18	I remember feeling very sad, my mum . . .
Probable		
Toy	20	. . . my uncle had bought me a loopy loo doll. It was almost as . . .
Birth of a sibling	16	. . . the arrival of my baby brother. When he was born and my . . .
Home	16	. . . the front door opened directly into the kitchen which had . . .
School	15	. . . my first day at primary school, there was another little girl . . .
Crying	11	. . . I remember crying hysterically . . . I would not be comforted . . .
Holidays	11	. . . we travelled to a holiday camp in Sussex on the Small Hythe . . .
Dreams	11	. . . being potty trained in my dream . . .
Improbably late		
Home	59	In the winter of 1940 we lived in south London . . .
Activities	26	. . . playing football with my friends . . .
School	15	I attended the local school. The school remained open . . .

study), and an older group comprised of all remaining respondents ($n = 5,213$). The mean age at encoding was 3.56 (95% CI = [3.44, 3.68]) for the younger group and 3.16 (95% CI = [3.11, 3.22]) for the older group. These means were reliably different, $t(1695) = 6.02$, $p < .001$, $d = 0.19$, 95% CI = [0.13, 0.25], showing that the older group had reliably earlier first memories than the younger group. The mean age of the younger group's earliest memories was then more consistent with previous studies using young adults, although we note that in the present study, even some of this group had memories dating to 2 years and below.³

Memory Content

It is hypothesized that early memories are fragments of memories (Bruce et al., 2000), lacking rich and detailed descriptions. This was tested in the present study by, first, assessing the word count of the memory descriptions as a function of memory group. A Poisson regression with planned comparisons (early vs. probable and early vs. late) found no reliable difference in word count between improbably early memories ($M = 69.20$, 95% CI = [67.02, 71.38]) and probable memories ($M = 68.82$, 95% CI = [66.87, 70.76]; $p = .14$, $b = 0.007$, 95% CI = [-0.002, 0.017]), but improbably early memories had a reliably shorter word count than improbably late memories ($M = 70.33$, 95% CI = [65.78, 74.88]; $p < .001$, $b = 0.025$, 95% CI = [0.011, 0.039]). Although reliably different, memories across all three categories had negligible differences in word count (± 1 word); thus, contrary to the suggestion that early memories are

fragments, the present findings show that they are similar in length to both probable and improbably late first memories.

Second, the corpus of memory descriptions was further analyzed using the Alceste software (IMAGE, 2018) for statistical analysis of textual data. This software bridges quantitative and qualitative methods, analyzing natural language using multivariate statistical methods to identify groups of words, that is, phrases and sentences, that reliably cluster together across different contexts. The resulting output provides categories of dominant themes in the corpus that are required to be named by the analyst. Separate analyses were performed on the descriptions of improbably early, probable, and improbably late memories, yielding a linguistic profile for each memory group (Table 1).

In Table 1, it can be seen that 100% of descriptions of improbably early memories fit into one of three categories, the dominant category being memory descriptions in which a pram (baby carriage) featured across various contexts. We also note that the category "birth of a sibling," which has previously been identified as an event likely to give rise to very early first memories (Eacott & Crawley, 1998; Usher & Neisser, 1993), did not feature in any of the improbably early memories analyzed in the study corpus. In contrast, 100% of descriptions of probable memories were accounted for by seven categories, all of which clustered around words and phrases referring to aspects of childhood, and many descriptions featured toys in a wide variety of contexts (see Table 1). Finally, 100% of descriptions of improbably late memories decomposed

into three categories, with the dominant category featuring descriptions that mentioned home in a wide variety of contexts. In summary, the linguistic analysis of the memory descriptions found them to be age appropriate; descriptions of improbably early memories referred to events and activities from infancy, such as being pushed in a pram or baby carriage; probable memories referred to events and activities from early childhood, for example, playing with toys; and improbably late memories often referred to events in the home, such as family gatherings of various sorts (examples of memories for each category are included in the Supplemental Material).

Discussion

The present findings pose a major conundrum: The child and young adult research, as reviewed earlier, concludes that earliest memories cannot exist below about the age of 2 years and that there would be comparatively few memories below the age of 3 years. Yet the main finding of the present survey of earliest memories, the largest such survey ever conducted, is that 2,487 (38.6% of the entire sample) of the earliest memories dated to when respondents were 2 years of age or younger, with, astonishingly, 893 (13.9%) dating to 1 year or younger. These are what we have termed improbable first memories and raise a question: How best do we explain them? Below, we evaluate three possible explanations: misdating, nature of the respondents, and the narrative and fictional nature of the “life story” (Habermas & Bluck, 2000; Köber, Schmiedek, & Habermas, 2015).

The misdating explanation

Dating of all autobiographical memories, including childhood memories, is predominantly inferential, and specific calendar and age dates are rarely retained in long-term memory (Thompson, Skowronski, & Larsen, 1979). Thus, it is possible that some of the dates given for first memories in the present study are incorrect estimates; indeed, it would be remarkable were they not. We assume, however, that such misdating is random rather than systematic and therefore represents noise in the age-at-encoding measure. Nonetheless, a plausible misdating account of the present findings might propose that, for unknown reasons, almost 40% of the sample systematically backward-telescoped their estimates of the age at encoding of their first memories (see Wang & Peterson, 2014, for evidence of forward telescoping in estimates of earliest memories).

If the misdating account were correct, then it would be expected that the improbable early memories would

be about events similar to those that were dated to 3 years and older. But this was not the case, and our content analysis found that improbable first memories were of events that related to infancy, whereas memories dating to 3 years and older (probable first memories) were of events related to childhood (see Table 1). These findings of differences in the content of improbably early and probable first memories effectively rule out the systematic misdating explanation.

The respondents: self-selection

The present sample of respondents differed from most previous studies in that they consisted of individuals from across the life span. Given that they freely responded to the request to complete a web-based memory survey, they were self-selected. Self-selection is common in most psychological research; after all, even students participating for course credit are self-selected. Random selection is typically not practically possible, particularly given resource constraints. Nevertheless, a very large sample, even if self-selected, has the advantage of very high power. In the present study, power approached 1 for all effect sizes, far higher than that in most psychology research and indeed in most social science research.

Yet the possibility remains that there is some unique aspect of this sample. One possibility is that members of this group have thought about (i.e., rehearsed) their past more than other groups, and in the course of so doing have, perhaps implicitly or nonconsciously, generated cues that allowed them to access far earlier memories than those accessed in previous studies. The present findings suggest that this may occur more frequently in older than in younger adults. A problem for this explanation, however, is that there were no differences in rated rehearsal between the older and younger groups, both of whom indicated equal moderate levels of rehearsal (see the Supplemental Material). Instead, it may be that middle-aged adults have a more developed life story than younger adults—one that incorporates and constructs knowledge from, or about, infancy (their own, possibly other people’s, possibly infancy in general) into the form of memories or what we here term fictional memories.

The life story and fictional memories

If the improbably early memories, memories that research tells us cannot be formed at such young ages, are largely of imagined rather than experienced events, how do these fictional memories arise? Note that we use the term *fictional memories* here rather than *false memories* or *illusory memories* for a number of reasons.

One is that the term *false memories* has a pejorative aspect to it—false memories are negative, and the term *illusory memories* suggests some sort of memory error. We note that more recent work has found positive aspects to false memories (see Howe, 2011b; Howe, Wilkinson, Garner, & Ball, 2016; Schacter, Guerin, & St. Jacques, 2011). Moreover, there may be adaptive consequences of fictional memories more generally. For example, in adulthood, preserving a positive and consistent self-narrative helps a person maintain a positive self-image that can foster positive social interactions with others, ones that arguably enhance the rememberer's quality of life (see Ross & Wilson, 2000, 2003). Fictional memories are then part of the life story and may play a central, and positive, role in defining periods of life or lifetime periods (Conway, 2005; Conway & Pleydell-Pearce, 2000). It is particularly noteworthy that all the memories we sampled (improbably early, probable, improbably late) included age-appropriate events, and viewed overall, they give a picture of a life story with successive early periods each with a distinctive content.

Thus, in our analysis of the content of the descriptions of memories from the different ages at encoding (see Table 1), we found that accounts dating to 2 years and earlier contained details relating to infancy. Under the three broad categories of pram, family relationships, and feeling sad, these were details such as “an image of my pram,” “being in my cot,” “in my push chair,” “having my nappy changed,” and, even more implausibly, “the first time I walked,” “wanting to tell my mother something before I could talk,” “the first word I spoke,” and so on. On the basis of these descriptions, we suggest that what people often have in mind when “recalling” these improbably early memories is an image (often visual) of an object or action possibly dating to very early childhood. This might be based on experience or derived from a photograph or a description (the rememberer may not be aware of the source of the image or images). Other sources of details for improbably early memories may derive from family stories or history, for example, “the first word you spoke was ‘X,’” “all you ever wanted to do when you were little was walk,” and so on. These facts of infancy, possibly along with some visual fragments, form the basis of remembering infancy: Their source is believed to be or even experienced as being from these very early ages and, accordingly, dated to those times. Thus, we suggest that what a rememberer has in mind when recalling fictional improbably early memories is an episodic-memory-like mental representation consisting of remembered fragments of early experience and some facts or knowledge about his or her own infancy or

childhood. In addition, further details may be nonconsciously inferred or added, such as that one was wearing a nappy (diaper) when standing in the cot. Such episodic-memory-like mental representations come, over time, to be recollectively experienced (Gardiner & Richardson-Klavehn, 2000) when they come to mind, and so for the individual, they quite simply are “memories,” memories that their content indicates date to a particular time: infancy.

We suggest that improbably early first memories fall in a larger class of fictional memories. Indeed, in the constructive view of memory, all memories contain some degree of fiction. For example, all memories are time-compressed and therefore do not literally represent the experience from which they derive. Similarly, all memories contain details that are both consciously and nonconsciously inferred. For example, Wells et al. (2014) found that clothes in childhood memories were poorly recalled. Nonetheless, respondents in that study recalled that they had been clothed, and the same applies to many other types of details, such as weather, time of day, conversations, and so on, that are also (nonconsciously) inferred rather than remembered. Memories, then, are part of a narrative of a person's life, and the way in which they correspond to experience and cohere with other memories is complex and dynamic.

Note that we use the term *narrative* as it used by Goldie (2012) in his account of *narrative thinking*, which is an internal mental representation rather than a publicly presented account. In this conception, the personal value and significance of a fictional memory resides in how coherent it is with other parts of autobiographical memory rather than with how well it corresponds to a previously experienced reality (see Conway, 2005, and Conway, Loveday, & Cole, 2016, for discussion of coherence and correspondence in autobiographical memory). Perhaps what is important when it comes to questions of accuracy of a memory, from any age, is the extent of fictionalization of details. In the present study, the data indicate that very early fictional memories are more common in middle-aged and older adults, and about 4 in 10 of this group have fictional memories for infancy. To a lesser degree, they are also present in some younger people. Perhaps, the life narrative or story, mainly for the middle-aged, needs to extend (for reasons that are not yet understood but possibly have to do with coherence and completeness of the life narrative) to the very earliest years of life and hence the emergence of improbably early fictional first memories.

Action Editor

D. Stephen Lindsay served as action editor for this article.

Author Contributions

S. Akhtar worked as M. A. Conway's postdoctoral research assistant during this research and preparation of the manuscript. Although both made different contributions, both agree that their contributions were equal. L. V. Justice assisted with the statistical analyses, and C. M. Morrison assisted with the initial preparation of the data. All the authors approved the final manuscript for submission.

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Declaration of Conflicting Interests

The author(s) declared that there were no conflicts of interest with respect to the authorship or the publication of this article.

Supplemental Material

Additional supporting information can be found at <http://journals.sagepub.com/doi/suppl/10.1177/0956797618778831>

Open Practices



All data have been made publicly available via Figshare and can be accessed at https://figshare.com/articles/Fictional_First_Memories/6115676. Materials for this study have not been made publicly available, and the design and analysis plans were not preregistered. The complete Open Practices Disclosure for this article can be found at <http://journals.sagepub.com/doi/suppl/10.1177/0956797618778831>. This article has received the badges for Open Data. More information about the Open Practices badges can be found at <http://www.psychologicalscience.org/publications/badges>.

Notes

1. Other rating measures of vividness, emotional intensity, and memory perspective were also collected, but they were secondary measures and not found to be systematically related to age at encoding. Consequently, they are reported in the Supplemental Material available online.
2. The full data set can be accessed at https://figshare.com/articles/Fictional_First_Memories/6115676.
3. As far as judgments of recollective qualities were concerned, all memories, regardless of group, were of moderate vividness and were rated as being recalled moderately often. Interestingly, improbably early memories were more strongly associated with an observer than a field perspective. See the Supplemental Material for full analyses.

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