

First Childhood Memories - Characteristics and Influences

Anna Bossmann

University of Twente, Enschede

This research was supervised by Dr. Rob van der Lubbe and Marit Ruitenbergh, MSc.

Abstract

The age of onset and the emotional valence of first childhood memories were examined in the main study. An additional sub study explored the possible influence of language, family composition and the fragmental and episodic qualities of childhood memories. Results showed the mean age to be 4.14 years, which is at the upper margin most studies have reported so far. The emotional valence participants ascribed to their memory depended on the way they were asked to report emotion. Specific valences were mostly negative (e.g. fear), but more general valences were mostly positive. Language emerged, on average, 2.8 years earlier than memories. Neutral memories could be recalled from earlier periods than memories with a negative emotional valence. Fragments emerged on average 7.9 months significantly earlier than episodes. No significant influence was found for household size and siblings. These findings support the view that age of onset and emotional content of first childhood memories are influenced by language and fragmental/episodic quality. Future research should take these factors into account when studying first childhood memories.

Introduction

First childhood memories have been studied for over a hundred years. During this period, researchers focused on a wide range of characteristics associated with childhood memories, for example the age of onset and the emotional valence of these memories. Different factors have been studied which might influence those characteristics, for instance language development, family composition and whether childhood memories are merely fragments or complete episodes.

The numerous studies conducted on childhood memories provide a variety of results and conclusions, and in some cases these contradict each other. The current study is designed to shed a new light on childhood memories by trying to explain the disagreement found between different studies on this topic. First, an overview is given of the relevant literature on characteristics of childhood memories relating to the age boundary and the emotional valence of these memories. The differences in methodologies by studies are examined to see whether they can provide possible explanations for the different results. Next, different factors that may have an influence on these characteristics are described, in particular language development, family composition and the question whether childhood memories are fragments or episodes. Possible explanations are given on how these factors might influence the age of onset and emotional valence of childhood memories.

Emotional valence

Miles (1895) was one of the earliest researchers to study first childhood memories. She asked one hundred students and faculty members of Wellesley College to fill in a questionnaire about the earliest thing they could remember. She was the first to conclude that emotions play a crucial role in childhood memories. Numerous studies were carried out on this topic after that, and although most researchers agree that emotions are a key characteristic of first childhood

memories (Howes, Siegel, & Brown, 1993; Kihlstrom & Harackiewicz, 1982; Mullen, 1994; Saunders & Norcross, 1988), they do not agree whether positive or negative emotion predominates in those memories.

In an early study on emotional valence of childhood memories, Dudycha and Dudycha (1933) asked 129 college students to report their first memory or memories (in case they were uncertain about which one was the actual first memory) on a form, and to provide an age approximation, and a description of the emotion they experienced. They also asked participants if someone told them about the experience and if they were certain that they actually did remember it. They found negative emotions to be more prominent than positive ones. A few years later, Waldfogel (1948) asked college students about memories from the first eight years of life and found pleasant memories to outnumber unpleasant ones. These two studies differed in the used methodology, with Dudycha and Dudycha asking about only one or a few memories and Waldfogel asking about all memories from the first eight years of life. This could be a possible explanation for the different results they found. Perhaps the first memory is more likely to be negative, but childhood memories overall are more likely to be positive.

Both results have been replicated numerous times. Some researchers found more negative emotion in first childhood memories (Cowan & Davidson, 1984; Howes et al., 1993; Mullen, 1994), while others reported more positive emotion (Kihlstrom & Harackiewicz, 1982; Saunders & Norcross, 1988). An overview of the different studies can be found in table 1.

The studies that found negative emotions to be more prominent, all used different ways of scoring emotion. Dudycha and Dudycha (1933), for example, asked participants to name the emotion that best fitted their memory, while in Howes et al. (1993) study, the authors ascribed an

Table 1

Overview of the different studies on the emotional content of first childhood memories

Study	Participants	Method	Emotion
Dudycha & Dudycha (1933)	129 college students, age unknown	Written description of the earliest memory (possibility to describe more than 1)	Fear: 30%, joy: 28%, anger: 10%, wonder: 8%, sorrow: 6%, pain: 5%, others: 13%
Cowan & Davidson (1984)	49 college students, age: 17-36 years	Written description of the earliest memory with a strong emotional reaction	All but 3 memories primarily negative
Howes et al. (1993)	300 college students, age: 19-22 years	Written description of 3 earliest memories	Negative: 55%, positive: 18%, neutral: 27%
Mullen (1994)	364 college students, mean age: 20 years	Written description of the earliest memory (not specifically asked to report emotion)	Negative: 11%, positive: 2%, no emotion reported: 87%
Waldfogel (1948)	124 college students, age unknown	Written description of memories from birth till 8th birthday	Pleasant: 46%, unpleasant: 27%, neutral: 17%, don't remember: 10%
Kihlstrom & Harackiewicz (1982)	150 high school & 164 college students, age unknown	Written description of the earliest memory	Pleasant: 41%, unpleasant: 29%, neutral: 30%
Saunders & Norcross (1988)	184 college students, age: 18-25 years	Written description of the earliest memory	Pleasant: 43%, unpleasant: 32%, neutral: 25%
Present Study (Main study)	508 college students, mean age: 21.5 years	Written description of the earliest memory	Fear: 40%, joy: 30%, sadness: 12%, neutral: 7%, other: 11%
Present Study (Sub study)	93 college students, mean age: 20.4 years	Questionnaire about earliest memory	Positive: 43%, negative: 40%, neutral: 17%

emotion to the memory descriptions without involving the participants. Mullen (1994) on the other hand, neither asked participants to report an emotion, nor scored the memories afterwards.

The method of scoring emotion was the same in all the studies that found more positive than negative emotion. In those studies, participants were asked to indicate whether their memory was pleasant, unpleasant or neutral (Kihlstrom & Harackiewicz, 1982; Saunders &

Norcross, 1988; Waldfogel, 1948). They were not instructed to provide a specific emotion, but rather to make a general choice. The study by Kihlstrom and Harackiewicz (1982) made an addition to this general category by also asking participants whether their memory could be categorized as involving "play", "trauma" or "trivia". They found that a large number of trauma memories (31%) were classified as pleasant or neutral. The fact that traumatic memories can be described as neutral or even pleasant makes clear that it does make a difference how participants are asked to report their emotion.

Two ways of reporting emotions are used in the current study. In the main study, the participants were asked to indicate the emotion they associate with the memory and in the sub study participants only indicate whether their memory is negative, positive or neutral. Based on the results of Kihlstrom and Harackiewicz we expect to see a number of cases in which a memory initially described in negative terms (e.g. fear, anger), is scored as neutral or positive in the questionnaire.

Age of onset

Many researchers have investigated the age at which childhood memories emerge. Sigmund Freud (1922) was one of the first researchers interested in the period of early childhood from which most adults cannot recall any memories. He coined the term infantile or childhood amnesia to describe this phenomenon and assumed that these early memories are repressed due to their sexual nature. Based on his patients' reports, Freud concluded that the period of childhood amnesia extends to the first six to eight years of life.

In the light of more recent research it seems that Freud might have overestimated the boundary of childhood amnesia. Most researchers reached the conclusion that the boundary lies between three to four years of age (Howes et al., 1993; Jack & Hayne, 2007; MacDonald,

Uesiliana, & Hayne, 2000; Mullen, 1994; Peterson, Grant, & Boland, 2005; Tustin & Hayne, 2010).

There is also evidence suggesting that childhood memories emerge even earlier, at two years. A study conducted by Usher and Neisser (1993) asked people about four early life events (hospitalization, sibling birth, death and move) and found that, depending on the event, people were able to recall details from when they were only two years old. A similar research, only focusing on the birth of a sibling, found the same results (Eacott & Crawley, 1998).

Jack and Hayne (2010) used a different approach. Rather than asking about different events, they asked participants to recall as many memories as they could from different age periods and found the average for earliest memory to be 23 months.

There seems to be great individual variations in the age from which people can first recall events, with some people reporting memories when they were younger than one year old, while others cannot recall anything from before the age of ten (MacDonald et al., 2000; West & Bauer, 1999). This individual variation does not seem enough to account for the great differences between studies, because studies with different age ranges for the earliest memory do not differ in the mean age they report (Tustin & Hayne, 2010).

The various studies identifying the age boundary for childhood memories between the ages 3 and 4 differ in the methodologies they used (see table 2). Some studies asked participant to report their single earliest memory, while others asked for a number of early memories. In some cases, cue words were used in an attempt to prompt participant's memory. Despite the obvious differences in these studies, they consistently report an age boundary between 3 and 4 years of age.

Table 2

Overview of the different studies on the age of onset of first childhood memories

Study	Participants	Method	Mean Age (years)
Howes et al. (1993)	300 college students, age: 19-22 years	Written description of 3 earliest memories	3.24, range: 1-10
Jack & Hayne (2007)	160 college students, age: 18-24 years	Written description of 6 earliest memories (with and without cue-words)	3.8 (no difference between cued and uncued)
MacDonald et al. (2000)	96 college students, mean age: 22.2 years	Written description of the earliest memory	3.57, range: 0-11
Mullen (1994)	364 college students, mean age: 20	Written description of the earliest memory	3.36
Peterson et al. (2005)	136 children, adolescents & adults, age: 6-19 years	Face-to-face interview about earliest memory	3.69 (10-19 year olds) 3 (6-9 year olds)
Tustin & Hayne (2010)	48 children, adolescents & adults, age: 5-20 years	Face-to-face interview about memories from birth to present age	1.73 (5-13 year olds) 3.2 (18-20 year olds)
Usher & Neisser (1993)	222 college students	Questionnaire about 1 of 4 events (hospitalization, sibling birth, family move, death)	2 (sibling birth & hospitalization) 3 (family move & death)
Eacott & Crawley (1998)	130 college students, mean age: 19.7 years	Questionnaire about sibling birth	2 (40% can answer 3+ questions about event) 2.4 (75% can answer 3+ questions about event)
Jack & Hayne (2010)	6 college students, all age 19	Face-to-face interview about memories from birth to present age	1.9, range: 0.9-2.5
Present Study	810 college students, mean age: 21.7 years	Written description of the earliest memory	4.14, range: 1-15

Although most studies identified the emergence of first memories between the ages 3 and 4, there are some studies arguing for a lower boundary (Eacott & Crawley, 1998; Jack & Hayne, 2010; Usher & Neisser, 1993). These studies used a completely different approach by either

asking about one specific event (for example a sibling birth) or about a specific age range (for instance 0-2 years). Memories from earlier periods seem to be more difficult to recall, but it seems to be possible to remember them when specific events or specific ages are tackled.

The great individual differences in the ages from which people recall their first memory reported in a number of different studies (Howes et al., 1993; MacDonald et al., 2000) make it reasonable to assume that there are a number of factors which influence the emergence of first memories. We will describe three possible factors of influence next.

Fragments & episodes

Aside from the individual variations in the reported age of first memories, there seems to be a more qualitative difference between earlier and later first memories. A study conducted by Mullen (1994) found 15% of memory descriptions to be of a more fragmental character than others, which means they were recollections of a single moment in time rather than full episodes with a beginning and an end. These memories originated from a significantly earlier age than the more episodic memories (3.1 years and 3.5 years, respectively).

Bruce et al. (2005) specifically asked participants in their study to describe one episode and one fragment and found comparable results to Mullen. Fragment memories originated, on average, from 3.5 years and episodic memories from 4 years. They also found that fragment memories were briefer, less detailed, contained fewer emotions and were dated with less confidence than episodic memories.

There might also be a tendency for fragment memories to be filtered out when participants are asked to describe their first memories, because fragments can be so short that participants prefer to describe a memory that is more detailed (Jack & Hayne, 2010). Since most studies asked for a written description of the earliest memory, the impact on the reported age of

first memories could be great. Fragment memories could be filtered out in most of the studies on childhood memories. This would also explain why studies asking about specific events yield earlier first memories. These studies ask more specific questions, so the tendency for fragments to be filtered out is smaller.

To our knowledge, there has not been a lot of research that differentiated between fragment memories and episodic memories, so it seems worthwhile to collect more data on this topic and link it to the other characteristics of first childhood memories, especially the age of onset, to see if they influence each other.

Language

Language development influences the onset of verbally recallable memories. That does not mean that there are no memories formed before children acquire language, but that these memories are not accessible verbally. This was strikingly demonstrated in a study by Simcock and Hayne (2002). Children between 2.3 and 3.3 years took part in a unique event and their memory was tested six to twelve months later, verbally and nonverbally. During this time, the children's language skills improved and they acquired the vocabulary that would be necessary to describe the event that they participated in earlier. Despite this, none of the children described the event using words they had acquired in the period after the event. They only used words that were already part of their vocabulary at the time the event happened. When their memory was tested nonverbally, however, they recognized photographs and actions corresponding to words that had not been part of their vocabulary at the time of the event.

The results of this study make clear that children do form memories without the relevant language skills, but that these memories are not accessible by verbal recall later. The language skills necessary develop gradually and a certain amount of facility with language is essential for

creating verbally accessible memories (Nelson, 1993). It seems reasonable then, to assume that there is a relationship between the age at which language emerges and the onset of verbally reportable memories. We will explore this possibility in this paper to examine whether it can explain the differences in the reported age boundary of childhood memories.

The time between language emergence and the onset of first childhood memories might additionally have an influence on the emotional content of memories. Morrison and Conway (2010) found words naming emotional labels (positive and negative) to be acquired significantly later than words naming more simpler concepts, like objects. This would suggest that a smaller time span between language emergence and memory emergence results in less emotional first memories. We will explore this possibility using our own data on first memories.

Family composition

Besides the influence language has on first memories, there is also evidence that the composition of a family might influence the age from which first memories can be recalled. A study conducted under Chinese children by Wang, Leichtman, and White (1998) compared only children to children who grew up with siblings. The results showed that the first memories emerged almost 9 months earlier for only children than for sibling-children. Comparing only children to the firstborns in families with more than one child also yielded a significant difference, with only children's first memories originating ten months earlier than those of firstborns.

Other studies focused on siblings within one family and found firstborns to have the earliest memories in comparison to their younger siblings (Harpaz-Rotem & Hirst, 2005; Mullen, 1994). Not only the presence of siblings, but also the number of adults living in an household might have an influence on the age of onset of first memories. Artioli, Cicogna, Occhionero, and

Reese (2012) investigated the impact of extended households (with at least one extra adult besides parents) on first memories and found that people from extended households report significantly earlier ages of memory onset than people from nuclear households (with no extra adults besides parents). Also, the more adults these people grew up with, the earlier their memories originated.

There are, however, studies that found no effect of family composition on the earliest recollections of people from different cultural backgrounds (MacDonald et al., 2000; Mullen, 1994). We want to further investigate the possible influence birth order and family size might have on the age people assign to their earliest memories. We will examine these factors in our sample and find out if they can help explain the great age difference between peoples' first memories.

The goal of the current study is to gain more insight into first childhood memories, especially the age of onset and the emotional valence. To do this, data will be collected and analyzed from a sample of students from a Dutch University. Information will be gathered on the age of onset and the emotional valence of first childhood memories, but also on the factors we believe to have an influence on those characteristics: language, family composition and the fragmental and episodic qualities.

Based on the literature, we believe that in this study there will be a relationship between the fragmental and episodic qualities of first memories and their age of onset. The hypothesis is that fragments emerge earlier than episodes and that this is due to the smaller time span between language emergence and memory emergence.

We also believe that language development will have an influence on both the age of onset and the emotional content of first memories. We assume that language emerges significantly earlier than first memories and that a smaller time span between language emergence and memory emergence results in less emotion.

Another hypothesis in the current study is that there will be a relationship between family composition and the onset of first memories. Only children are believed to have earlier memories than firstborns and they, in turn, are believed to have earlier memories than later born siblings. Furthermore, children who grew up in households with additional adults besides parents are considered to report earlier memories than children growing up without extended households.

We will next describe our own research, the subjects, the materials and the procedure. We then analyze the data we gathered on the reported age of first memories, the emotional content, the fragmentary and episodic qualities, the emergence of language and the family composition. Finally, we will integrate our own results with the data from other studies and try to explain the disagreement found in the literature on the subject of childhood memories.

Method

Participants

A total of 808 students from the Dutch University of Twente in Enschede participated in the current study. The sample consisted of 611 females and 197 males. Their mean age was 21.7 years (age range: 17-54 years). They were all enrolled in a first year Psychology course in the year 2011, 2012 or 2013 and provided a description of their first memory as a course requirement. Students who were enrolled in the course of 2013 were offered the opportunity to participate in an additional online questionnaire study. 102 students filled in that questionnaire. There were 83 females and 19 males, with a mean age of 20.4 years (range: 18-47). Of these, nine participants

had to be excluded from further analysis, either because they failed to fill in the questionnaire correctly or their data could not be linked to the first part of the study, the description of the memory. Therefore, the total number of participants included in the final analysis is 93.

Materials & procedure

Description of childhood memory

At the beginning of the course, the students were handed out a reader with a number of different assignments they had to complete as a course requirement. One of the assignments was to briefly describe the first memory from their childhood which they could remember. It was specified that this should be a memory they remembered themselves, not one they have been told and preferably one that is not related to a photograph or film. They were also required to give information about how old they were at the time of the described event, they had to choose what emotion they associated the memory with (joy, fear, sadness, surprise, anger disgust or neutral) and indicate whether they associated the memory with a specific sensory modality. A precise description of the assignment can be found in Appendix A. The students were offered the opportunity to take part in a tutorial, so that they could ask questions and get help with the assignments. They were also given an example description of a childhood memory.

Questionnaire

After the students had handed in their description of a childhood memory they were informed by the lecturer about a follow-up study on the subject of their childhood memories. They could register online for participation in that study and were granted study credit after they had filled out the questionnaire, which was also done online.

The purpose of the questionnaire was to gather further information relevant to the current study. Participants were asked to fill in their full name, so that the data from the questionnaire

could be linked to the data from their earlier description of a childhood memory. The first questions were designed to collect information about the family composition. Participants were asked about the size of the household they grew up in, the number of siblings they had and the ages of the siblings. Next, questions about the memory they described in the first part of the study were asked. These included questions about the degree of confidence that the event they described had really happened, whether they would describe it as positive, negative or neutral and whether it can be classified as a fragment or an episode. The subsequent questions required the participants to contact a person that could verify their childhood memory and the age at which it took place, if there was another person present at the event. In the last part of the questionnaire participants were asked to give the age at which they started talking as precise as possible and they were encouraged to contact their parents if they were not sure about the exact age. At the end of the questionnaire the participants were given the e-mail address of the researcher, so that they could get in contact if they had any questions or would like to be informed about the results of the study. A copy of the questionnaire can be found in Appendix B.

Data-analysis

In order to carry out analysis on the sample, the data from the memory descriptions and the questionnaires are linked together for each participant. Graphs are created for initial analysis to get an insight into the distributions of the variables and possible relationships between the different variables. Descriptive statistics and/or frequency distributions will be calculated for the variables associated with emotional valence, the age of onset of first childhood memories and the categorization of fragments and episodes.

The influence of language on the emotional valence of memories will be analyzed, comparing neutral and emotional memories. Language is also assumed to influence the age of

onset of verbally reportable childhood memories. This relationship will be analyzed by testing whether language emerges significantly earlier than memories and finding out whether there is a correlation between the two.

The influence of family composition on the age of first memories will be explored by comparing the means of nuclear (only parents as adults) and extended (additional adults besides parents) households and determining if they differ significantly from each other. The same procedure is used to explore the differences between the ages of first memories for only children, firstborns and children with older siblings.

Analysis will also be carried out on the fragmental and episodic characteristics of childhood memories, more specifically, whether fragments emerge earlier than episodes and whether this is due to the smaller time span between language onset and memory onset for fragments.

Results

Emotional valence

One purpose of this study was to determine how emotions are distributed in earliest childhood memories. The results show that fear was the most frequently reported memory with 40%, followed by joy with 30% and sadness with 12%. 7% of the memories were described as neutral. The rest of the emotions were distributed amongst surprise (6%), anger (4%) and disgust (1%). The distribution of emotions for the whole sample and for the subsample can be seen in figure 1. The distribution of emotions in the subsample is almost the same as in the whole sample, so we can assume that the subsample is representational for the whole sample.

Participants in the subsample filled in the additional questionnaire and were asked whether their memory could be described as positive, negative or neutral. 43% of the participants

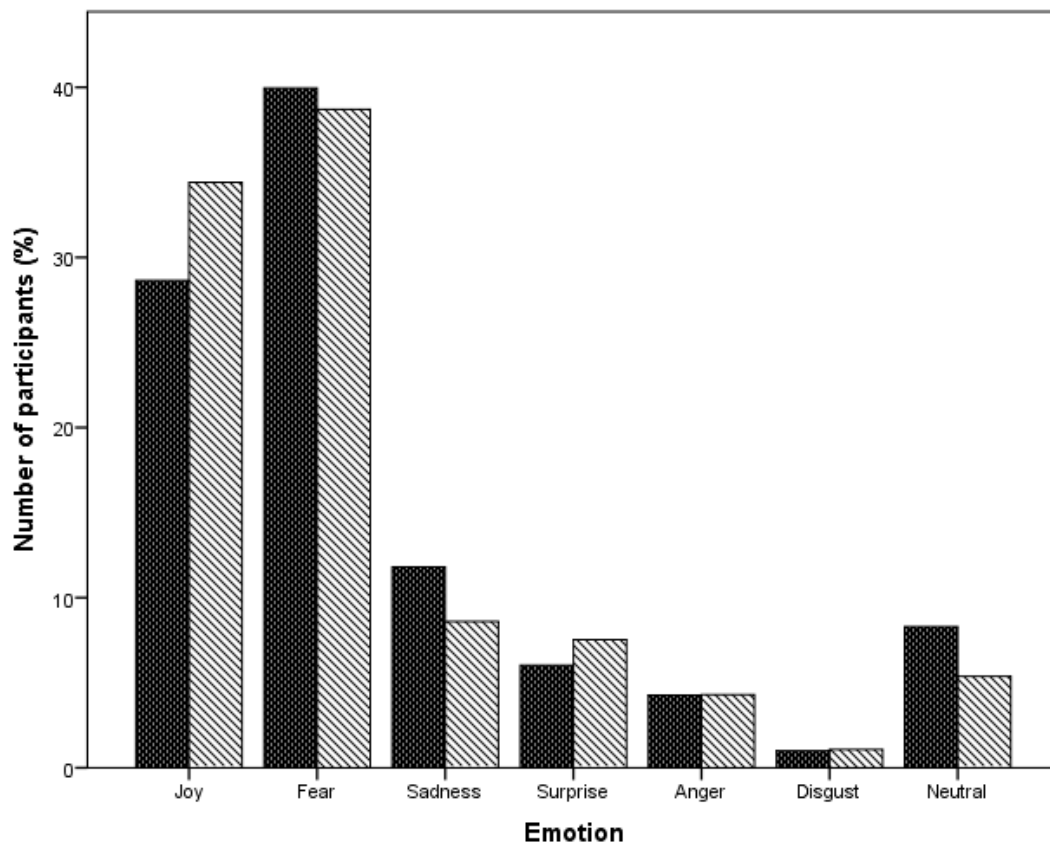


Figure 1. Emotional Distribution from all participants (dotted) and from the subsample (diagonally slashed).

rated their memory as positive, 40% were rated as negative and 17% as neutral. The emotional descriptions and the answers of the questionnaire were compared and as might be expected, the majority of joyful and fearful experiences were rated as positive and negative, respectively. However, a substantial amount of fearful experiences (33%) were scored as neutral or positive, rather than negative.

It was also expected that language might have an influence on the emotional tone of the memories, specifically, a smaller time span between the emergence of language and the emergence of the first childhood memory would result in a less emotional content. The

differences between the emotions regarding the time span between language- and memory onset can be seen in figure 2. Comparing the means of neutral and emotional memories with a One-way ANOVA yielded a significant difference [$F(5, 86) = 2.72, p = .025$]. A post-hoc analysis showed that neutral memories differ significantly from the emotions fear ($p = .015$), sadness ($p = .008$) and anger ($p = .003$).

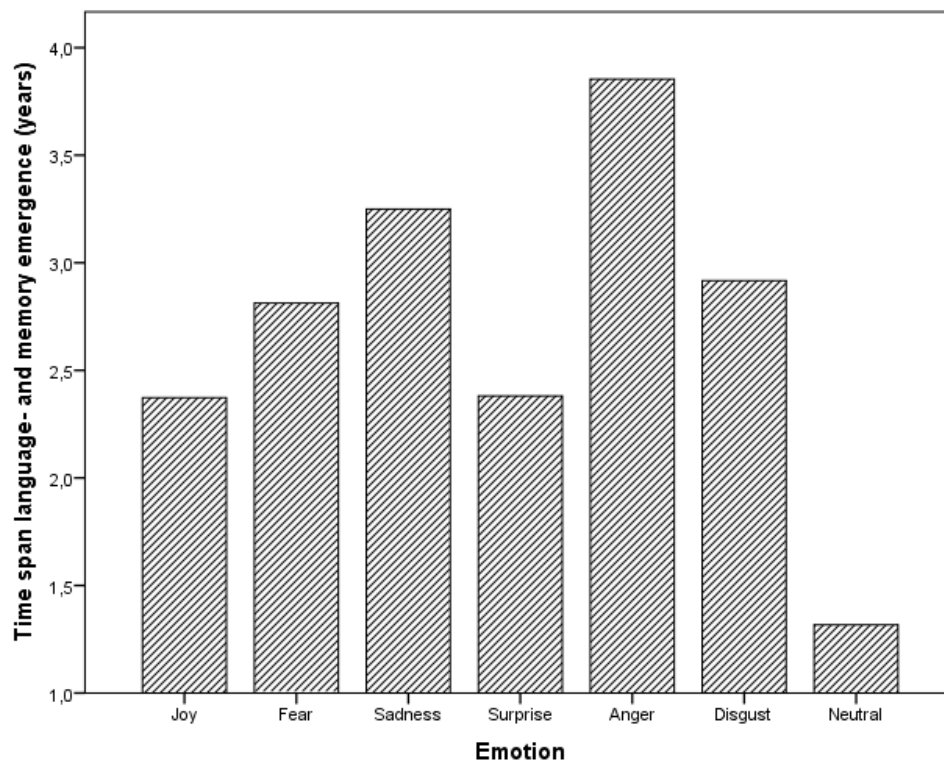


Figure 2. The mean time span between language- and memory emergence for each emotion.

Age of onset

In the current sample, the mean age for first childhood memories was 4.14 years, which is at the upper boundary most studies have reported so far. The individual differences regarding this age are quite large, the reported ages range from 1 to 15 years. The distribution of the ages of the memories can be seen in figure 3.

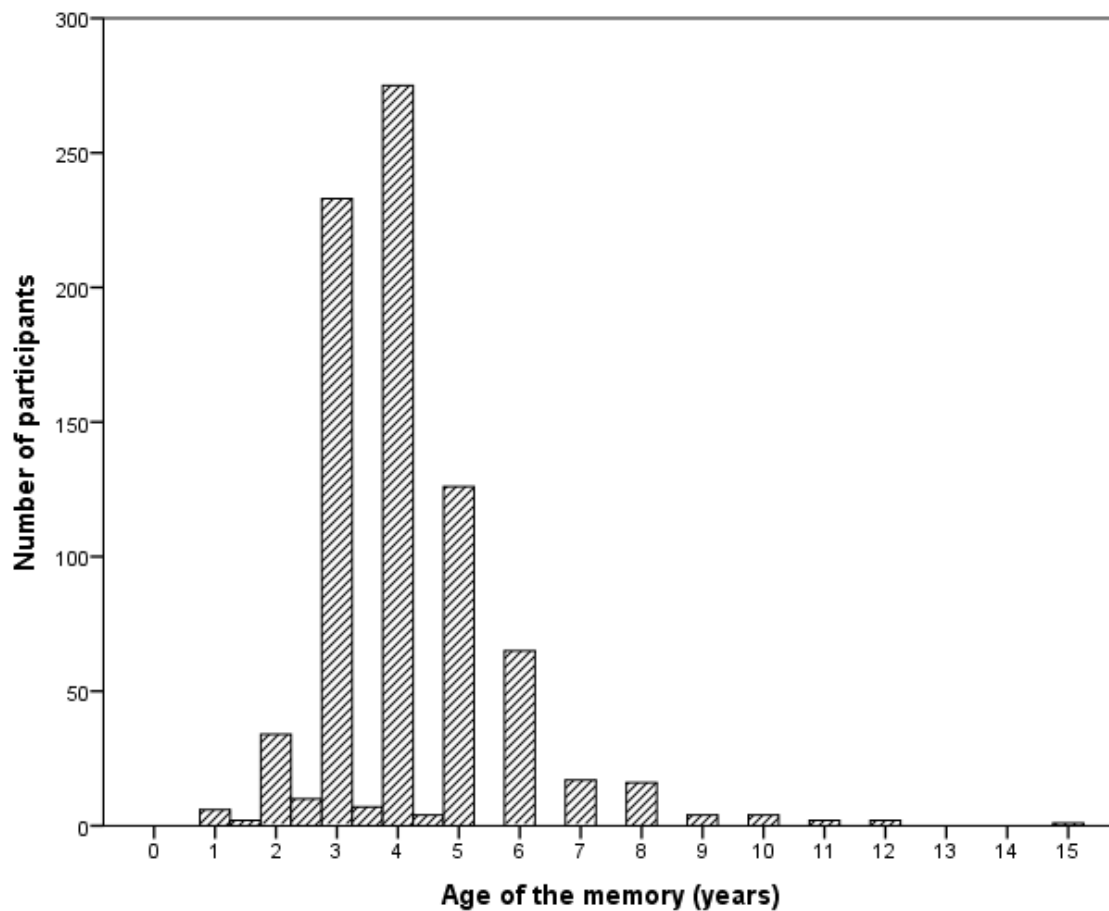


Figure 3. Distribution of the age of onset of childhood memories. The small numbers at the midpoint of years (e.g. 2.5) are due to the fact that most participants reported their age of the memory in whole years

From the literature on the relationship between language and memories it could be expected that there are no verbally accessible memories before language emerges. A one-sample t-test confirms that language generally does come first ($t = 19.41$, $p < .001$), on average 2.8 years before first memories.

It was also expected that a relationship between language and the age of onset of childhood memories would be found, therefore, a Pearson correlation was calculated. There seems to be a slight negative correlation between the emergence of language and the age of first

childhood memories ($r = -.22$, $p < .05$), so as language emerges later, first memories emerge earlier. This result was not expected.

We also hypothesized that family composition would have an effect on the reported memories, more specifically, that people from extended households (with one or more additional adults besides parents) would have earlier first memories than people from nuclear households (with no additional adults). A one-way ANOVA analysis was carried out, but it did not yield significant results [$F(1, 91) = 2.65$, $p = .11$].

To find out whether only children had earlier first memories than firstborns and younger siblings, the three groups were compared. A one-way ANOVA analysis was conducted, but there were no significant differences between groups [$F(2, 90) = .845$, $p = .433$].

Fragments & episodes

In the questionnaire, participants were asked whether they would categorize the emotion they described as a fragment or an episode. More than half of the participants categorized their emotion as being a fragment (64%) rather than an episode (36%). This was not expected, because the literature suggests that only a small part of memories are fragments (Jack & Hayne, 2010; Mullen, 1994).

Because of their different characteristics, it was expected that fragment memories would emerge earlier than episodic memories. A one-way ANOVA was conducted to test this hypothesis. A main effect of fragments and episodes on the age of first memories was found with $F(2, 75) = 3.78$, $p = .023$. Memories characterized as fragments emerged on average 7.9 months earlier than episodic memories.

The next step in the analysis was to investigate the relationship between language and the fragmental or episodic characteristics of childhood memories. Fragments are generally briefer

and contain less detail, so it was assumed that they might need less sophisticated language skills than episodic memories in order to be remembered. The time that passed between language development and the first childhood memory was compared for fragments and episodes.

Analysis showed that there was no significant difference [$F(1, 86) = 3.4, p = .068$].

Confirmation of the memory

In the sub study, we asked participants to contact a verifier, who was asked in how far he or she thought the age and the description of the memory was accurate. There were 14 cases in which the reported age of the verifier did not correspond with the reported age of the participants. In 11 of these cases, the difference was not more than a year. There were 2 cases in which the difference between verifier and participant was 2 years and one case in which the difference was 3 years.

In 67% of the cases, the verifier agreed completely with the description of the memory content. Only in four cases were the memory was confirmed partially, the degree of confirmation was 50% or lower. In all the other cases, the confirmation was at least 70%. The mean confirmation score is 78%.

Discussion

The goal of the current study was to collect more data on first childhood memories, especially the age of onset and the emotional valence and to get an insight into different factors that we believe influence these characteristics: language, family composition and fragmental and episodic qualities of first memories.

Emotional valence

The current study found fearful memories to outnumber joyful ones. This is in line with a number of earlier studies on childhood memories (Dudycha & Dudycha, 1933; Howes et al.,

1993; Mullen, 1994). Another finding of the current study is that most memories are scored as positive, which also has been reported earlier (Kihlstrom & Harackiewicz, 1982; Saunders & Norcross, 1988; Waldfogel, 1948). Comparable to the results of Kihlstrom and Harackiewicz, we found that when people had to choose between a number of emotional categories (fear, joy, sadness, etc.), fear was most often chosen. When they were asked, however, to indicate whether their memory was pleasant, unpleasant or neutral, most people chose positive. 33% of the memories described as fearful in the main study, where scored positive or neutral in the sub study.

Experiences that were fearful as a child may be seen in a more neutral or positive way as an adult, maybe because people feel that something good came from the experience or that it was actually not as frightening as they interpreted it as a child. Maybe there is a tendency to judge a childhood memory from an adult perspective when asked whether it is positive, negative or neutral. Future research should address this question and focus on how different ways of asking people to report emotion can lead to different outcomes.

We also hypothesized that the emotions of first childhood memories are influenced by the emergence of language. This hypothesis was confirmed, with neutral memories emerging earlier after language acquisition than emotional, specifically negative (fear, sad and anger) memories. This result fits with the findings of Morrison and Conway (2010), that words used to label emotions are acquired later than simpler words. That this is specifically the case for words naming negative emotions, has, to our knowledge, not been reported yet. It might be possible that words naming negative emotions are acquired later than words naming positive emotion. More research on this subject is needed to find out whether there is a difference between acquiring words naming positive and words naming negative emotions.

Another question is whether memories not characterized by emotion have actually been experienced without an emotion or that there had been an emotion, but that it is lost from memory, maybe because of shortcomings in language for emotional concepts. Howes et al. (1993), for example, found some memories described by participants as emotionally neutral to be described as highly emotional by a verifier. The question remains open whether first childhood memories are actually without an emotional valence in some cases or that the emotion cannot be verbally recalled because of a lack of the necessary language skills at the time of the event.

Age of onset

In the current study, the mean age for the age of first memories was 4.14 years, which is slightly higher than the ages most studies using a comparable method reported. Based on the high number of participants who provided the age of their first memory ($N = 808$), we expected the results to correspond more closely with those of previous research. This could be due to the way in which the data was collected. Participants could complete the assignment of describing their first memories where and when they wanted and they did not get a reward for completing the assignment, so their motivation to carefully think back and really report the single earliest memory could be lower than if they would have completed the assignment in a more controlled setting.

Language seems to be necessary for the verbal accessibility of childhood memories and language does seem to appear on average 2.8 years earlier than the first memory. In only 15% of the cases, the time span between language onset and first memories was smaller than 1 year. This is strong evidence for the assumption that language is essential for the recall of memories, at least when that recall is verbal. As Simcock and Hayne (2002) suggested on the basis of their results, the recall of memories from the preverbal period may only be possible when the recall is

nonverbal. Language makes it possible to talk about experiences, which may also help children to access their memory more frequently and memories that are accessed more frequently are more likely to remain (Nelson, 1993). Furthermore, language seems to function as a retrieval cue, so as the facility with language gets better, children are more and more able to use language cues to access their memory of earlier experiences (Hayne, 2004). This also explains why a certain facility with language seems to be necessary for the verbal recall of first childhood memories.

The current study found no evidence for the influence of family composition (neither for household size, nor for siblings). It is possible that this is due to the small number of participants from extended households in the current subsample ($N = 11$) and the small number of only children ($N = 15$). It is also possible that there is actually no influence of family composition on first memories, a results also found by MacDonald et al. (2000) or that there are a number of other factors of influence which were not measured in the current study. The character of the relationship between the family members, for instance, could be of influence. This is probably also related to culture, with families in some cultures having closer relationships than in others.

Fragments & episodes

Fragments and episodes seem to be an important characteristic of first childhood memories. They differ significantly in the age at which they emerge, with fragments emerging on average almost 8 months earlier than episodes. This could explain why studies focusing on a specific event or a specific age period, yield earlier first memories than studies asking in more general terms about first childhood memories. By asking more specific questions, participants are encouraged to report small pieces of information, too.

To our knowledge, most studies do not make a clear distinction between fragmental and episodic memories and when they do, fragments form only a small part of the total of reported

memories. This could have a variety of reasons. In most studies, participants are asked to describe their first memories by writing them down. This method could give participants the impression that they are supposed to write a certain amount of information and fragments are often so brief that their description may be very short. This could lead participants to report a memory they recall in more detail, although this may not be the actual first memory. If a fragment is reported, there might be a tendency for participants to add as many words to the description as possible. This could lead the researcher, who scores the memory as a fragment or an episode, to think that the memory is an episode, when it is actually a fragment. To our knowledge, no study asked participants themselves whether they would describe their memory as a fragment or an episode. In the current study, participants were given this opportunity and a surprising number of participants classified their memory as being a fragment rather than an episode (64% and 36%, respectively).

Future research should concentrate more on making a distinction between fragmental and episodic memories. It should also encourage participants to report fragments, either by using a different method than written descriptions, or by emphasizing that the description does not have to be a long one. It also seems worthwhile to ask participants themselves to categorize their memory as a fragments or an episode.

Conclusion

This study aimed to investigate the age of onset and the emotional content of first childhood memories and to relate these characteristics to factors that are believed to influence them: language, family composition and fragmental and episodic qualities. The results show that language and the fragmental and episodic qualities influence first childhood memories. These factors should be of particular interest for future research, because they are important in

understanding first childhood memories Researchers also have to be cautious about the way they ask participants to report their memory, because depending on the questions asked, different results could be obtained.

References

- Artioli, F., Cicogna, P. C., Occhionero, M., & Reese, E. (2012). "The people I grew up with": The role of sociodemographic factors in early memories in an Italian sample. *Memory*, 20, 189-197.
- Bruce, D., Wilcox-O'Hearn, A., Robinson, J. A., Phillips-Grant, K., Francis, L., & Smith, M. C. (2005). Fragment memories mark the end of childhood amnesia. *Memory & Cognition*, 33, 567-576.
- Cowan, N., & Davidson, G. (1984). Salient Childhood Memories. *The Journal of Genetic Psychology*, 145, 101-107.
- Dudycha, G. J., & Dudycha, M. M. (1933). Some Factors and Characteristics of Childhood Memories. *Child Development*, 4, 265-278.
- Eacott, M. J., & Crawley, R. A. (1998). The Offset of Childhood Amnesia: Memory for Events That Occured Before Age 3. *Journal of Experimental Psychology*, 127, 22-33.
- Freud, S. (1922). *Drei Abhandlungen zur Sexualtheorie*. Wien: Franz Deuticke.
- Harpaz-Rotem, I., & Hirst, W. (2005). The earliest memory in individuals raised in either trational and reformed kibbutz or outside the kibbutz. *Memory*, 13, 51-62.
- Hayne, H. (2004). Infant memory development: Implications for childhood amnesia. *Developmental Review*, 24, 33-73.
- Howes, M., Siegel, M., & Brown, F. (1993). Early Childhood Memories: Accuracy and Affect. *Cognition*, 47, 95-119.

Jack, F., & Hayne, H. (2007). Eliciting adults' earliest memories: Does it matter how we ask the question? *Memory*, 15, 647-663.

Jack, F., & Hayne, H. (2010). Childhood amnesia: Empirical evidence for a two-stage phenomenon. *Memory*, 18, 831-844.

Kihlstrom, J. F., & Harackiewicz, J. M. (1982). The Earliest Recollection: A New Survey. *Journal of Personality*, 50, 134-148.

MacDonald, S., Uesiliana, K., & Hayne, H. (2000). Cross-cultural and gender differences in childhood amnesia. *Memory*, 8, 365-376.

Miles, C. (1895). A Study of Individual Psychology. *The American Journal of Psychology*, 6, 534-558.

Morrison, C. M., & Conway, M. A. (2010). First words and first memories. *Cognition*, 116, 23-32.

Mullen, M. K. (1994). Earliest recollections of childhood: a demographic analysis. *Cognition*, 52, 55-79.

Nelson, K. (1993). The psychological and social origins of autobiographical memory. *Psychological Science*, 4, 7-14.

Peterson, C., Grant, V., & Boland, L. (2005). Childhood amnesia in children and adolescents: Their earliest memories. *Memory*, 13, 622-637.

Saunders, L. M. I., & Norcross, J. C. (1988). Earliest Childhood Memories: Relationship to Ordinal Position, Family Function, and Psychiatric Symptomatology. *Individual Psychology*, 44, 95-105.

Simcock, G., & Hayne, H. (2002). Breaking the Barrier? Children Fail to Translate Their Preverbal Memories Into Language. *Psychological Science*, 13, 225-231.

- Tustin, K., & Hayne, H. (2010). Defining the Boundary: Age-Related Changes in Childhood Amnesia. *Developmental Psychology*, 46, 1049-1061.
- Usher, J. A., & Neisser, U. (1993). Childhood Amnesia and the Beginnings of Memory for Four Early life Events. *Journal of Experimental Psychology*, 122, 155-165.
- Waldfoegel, S. (1948). The Frequency and Affective Character of Childhood Memories. *Psychological Monographs*, 62, Whole No. 291.
- Wang, Q., Leichtman, M. D., & White, S. H. (1998). Childhood memory and self-description in young Chinese adults: the impact of growing up an only child. *Cognition*, 69, 73-103.
- West, T. A., & Bauer, P. J. (1999). Assumptions of Infantile Amnesia: Are There Differences Between Early and Later Memories? *Memory*, 7, 257-278.

Appendix A: Assignment Main Study

Probeer kort een zo oud mogelijke jeugdherinnering te beschrijven (zie voorbeeld), bij voorkeur één die niet op een foto of film staat en zeker niet één die je van horen zeggen hebt. Gebruik hiervoor niet meer dan 400 woorden. Geef aan hoe oud je toen was, en ook hoe oud je nu bent. Verder is het relevant te vermelden of de herinnering duidelijk beeldend is, of dat deze sterk gerelateerd is aan een andere sensorische modaliteit (geur, smaak, tast, geluid), of dat deze meer verhalend van karakter is. Geef ook aan of de herinnering is gerelateerd aan een bepaalde emotionele toestand, of dat deze meer neutraal van aard was. De herinnering dient ook van voldoende niveau te zijn, en je zult begrijpen dat het ook hierbij cruciaal is dat de herinnering uniek is. Verder word je gevraagd aan te geven of je akkoord gaat met het eventuele gebruik van de beschreven herinnering voor wetenschappelijk onderzoek.

Appendix B: Questionnaire of the sub study

Alvast bedankt voor het invullen van deze vragenlijst. Voor sommige vragen is het nodig om contact op te nemen met een persoon, die jou herinnering kan bevestigen. Nader uitleg hierover volgt bij de desbetreffende vragen.

1. Vul hieronder alsjeblieft jouw SONA-ID in.

2. Voor- en achternaam (jouw naam wordt alleen gebruikt om de data van deze enquête te koppelen aan de data uit de vragenlijst die je voor het vak Functieleer ingevuld hebt.

Jouw gegevens worden verder helemaal anoniem verwerkt)

3. Wat is je leeftijd?

4. Hoeveel personen woonden er in het huis/appartement waarin je bent opgegroeid? (bv. ouders, broers en zussen, grootouders, enz.)

5. Hoeveel broers en zussen heb je?

6. Geef hieronder alsjeblieft de leeftijden van al je broers en zussen aan

7. Wat is je leeftijd bij de beschreven jeugdherinnering?

8. Hoe zeker ben je dat de leeftijd die je aangeeft voor de herinnering daadwerkelijk klopt? (%)

9. Zou je de herinnering als voornamelijk positief, negatief of neutraal beschrijven?

- ☐ positief
- ☐ negatief
- ☐ neutraal

10. Zou je jouw herinnering eerder als een fragment (een momentopname) of als een episode (een verhaal met een duidelijk begin en einde) beschrijven?

- ☐ fragment
- ☐ episode
- ☐ weet niet

In het volgende deel gaat het erom jouw herinnering te verifiëren. Neem hiervoor alsjeblieft contact op met een persoon die aanwezig was bij de door jouw beschreven herinnering. Beschrijf het gebeurtenis aan deze persoon zoals je dit ook hebt gedaan voor de opdracht (noem hierbij niet de leeftijd waarop het gebeurde!!). Vraag aan de persoon in hoeverre jouw reconstructie van het gebeurtenis klopt en vraag daarna op welke leeftijd het volgens hem/haar plaatsvond. Als er niemand anders aanwezig was bij de herinnering sla vraag 11 en 12 over.

11. In hoeverre klopt de door jouw beschreven herinnering volgens de contactpersoon?

- ☐ helemaal
- ☐ helemaal niet
- ☐ gedeeltelijk, ongeveer (%)

12. Wat was je leeftijd bij deze herinnering volgens de contactpersoon?

13. Hoe oud was je toen je voor het eerst begon te praten? Geef dit zo nauwkeurig mogelijk aan, dus graag in jaren en maanden (Als je dit niet weet neem alsjeblieft contact op met je ouders en vraag het aan hen)

Hartelijk dank voor het invullen van de vragenlijst. Heb je vragen of opmerkingen over dit onderzoek of wil je op de hoogte worden gesteld van de resultaten? Stuur dan een e-mail aan: anna.bossmann@gmail.com