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Earliest versus other autobiographical memories of school-age children

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Abstract

Earliest memories have been the topic of scientific research for over a century and seen use as tools of clinical assessment. Still, it remains unclear whether they are in some way distinct or revealing about the person reporting them. This preregistered study examined whether children's self-reported earliest memories differ from other memories, and how their features link with mood and gender. Urban 9–13-year-old children in Finland ($N = 166$) reported on their earliest memory and another old autobiographical memory, and mood. Memories were coded for specificity, thematic content, social orientation, and emotional content. No differences between earliest and other memories were noted in specificity, trauma- and accident-related content, or emotional content. However, earliest memories had more play- and less visit-related content and were less likely to be social. Negative mood did not generally correlate with features of memories. Girls reported more social earliest and other memories, and more positive earliest memories. The findings are compared to research in other cultural environments. Overall, they do not support a privileged position for *the earliest memory* as an object of scientific research or clinical assessment.

Keywords Earliest memory · Autobiographical memory · Children · Gender · Culture

What is the first, earliest memory you can remember? Both children and adults will readily answer such a question and provide, often brief, sometimes elaborate, descriptions of experiences that they date to their third or fourth year on average (Akhtar et al., 2018; Peterson et al., 2005). But does a query like this tap into a specific category of memories, a unique thing reasonably called *the earliest memory*? Or is the resulting report just one, more or less arbitrary, example of many old autobiographical memories? This study explores whether self-reported earliest and other autobiographical memories of school-age children differ in terms of their content and characteristics, and in how their features are associated with current mood and gender.

Historically, a number of psychologists and psychiatrists have argued that a person's earliest memory might provide special access to that person's "style of life" (Adler, 1937, p. 287), "habitual emotional attitudes" (Saul et al., 1956, p. 232), or "prototypical dilemmas, life strategies, and role paradigms" (Mayman, 1968, p. 316). Earliest memories have even seen use as a projective technique of clinical assessment (Bruhn, 1992; Fowler et al., 2000; Langs et al., 1960; Mosak, 1958), and are sometimes still discussed as part of assessment or therapy. People themselves also tend to rate their earliest memories as significant or important to them (Hutmacher & Morgenroth, 2022; van der Watt et al., 2016).

Whether especially revealing or not, some research has indicated that reported earliest memories are fairly, but not perfectly, stable and consistent in their features among adults. Adults tend to generally report the same earliest memories and in a similar way when repeatedly queried (Bauer et al., 2014; Ece et al., 2019). However, although children and adolescents also understand the request for an earliest memory, consistency in what is reported appears lower. Peterson et al. (2011) found just 20–40% of 8–13-year-old children to report the same earliest memory after a delay of two years, although when asked to provide three earliest memories, the memories of most children did show some overlap. Reese and Robertson (2019) also found most adolescents to report a different earliest memory at age 12 and age 16. The change in reported earliest memory cannot be fully explained

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by simple forgetting, either (Peterson, 2021). Overall, a recent review by Peterson (2021) suggested that what people report as their earliest memory is quite dependent on the circumstances, especially variations in the exact method of inquiry. This casts doubt on the sense and meaning of *the earliest memory* as an object of scientific research or clinical utility, or as a boundary or watershed where childhood amnesia ends (Jack & Hayne, 2007; Peterson, 2021). This may be especially the case among children.

Out of many possible characteristics of autobiographical memories, this study focuses on specificity (does the memory relate to a single event in time), thematic content (what sort of event the memory is about), social orientation (whether others are present in the memory), and emotional content (neutral, positive, and/or negative). Research has found that children's earliest memories are typically specific, clearly relating to a single event in time, rather than general or repeated (Göz et al., 2017; Peltonen et al., 2017; Peterson et al., 2005; Tõugu et al., 2022). Further, children's self-reported earliest memories are often about mundane, everyday events (Peltonen et al., 2017; Peterson et al., 2005). However, traumatic events, injuries, and illnesses are also frequently reported, by up to a quarter of children and adolescents (Peltonen et al., 2017; Peterson et al., 2005), similar to rates among young adults (Kihlstrom & Harackiewicz, 1982; Mullen, 1994). Transitions are another category frequently noted, found in the earliest memories of 20% of children and adolescents (Peterson et al., 2005) and 17% of university students (Kihlstrom & Harackiewicz, 1982).

In terms of social orientation, Peterson et al. (2005) found the earliest memories of Canadian Caucasian children and adolescents to be overwhelmingly individual by nature. However, cultural background seems to have a major effect, as 55% of the earliest memories of Palestinian children (Peltonen et al., 2017) and 60–70% of those of Turkish children (Göz et al., 2017) were found to have a social orientation, that is, to involve other people. Children's earliest memories appear to be mostly emotionally neutral with no clear indication of positive or negative affect, with findings ranging from 50 to 70% for emotionally neutral earliest memories (Peltonen et al., 2017; Peterson et al., 2005; Tõugu et al., 2022).

These studies provide some information about what children's self-reported earliest memories are typically like. Other studies have also collected some similar data about children's other early (but not explicitly earliest) childhood memories (e.g., Peterson et al., 2009). Further, Peterson et al. (2015) reported that children's memories of recent salient and stressful events were largely similar to their reported earliest memories in terms of unique information. However, to my knowledge, no studies have examined whether the contents, specificity, social orientation, or emotional content of self-reported earliest memories differ from those of other (early) autobiographical memories reported by the same children.

If earliest memories are a distinct, identifiable category among children, we might expect to note some consistent, qualitative differences between them and other early autobiographical memories. Further, if the earliest memory is a unique and stable category, its characteristics should reflect relatively permanent and non-changing attributes of the reporting person, if any at all. On the other hand, if what's reported as the earliest memory reflects current (and thus changing) contexts, we would expect them to be similarly affected by current concerns and circumstances as are other reported autobiographical memories. In relation to this question, this study also considers whether self-reported earliest memories of school-age children are related to current mood. If self-reported earliest memories are just one autobiographical memory among many, we would expect them to be similarly associated with current mood as other memories.

Mood-congruent material is generally more likely to be recalled (Blaney, 1986), and dysphoria and depressive symptoms are linked to negatively-valenced autobiographical memories being more accessible and likely to be reported among adults (Holland & Kensinger, 2010; McFadden & Siedlecki, 2020; Wisco & Nolen-Hoeksema, 2010). Further, depressive symptoms have also been linked to overgeneral memory, that is, tendency to retrieve autobiographical memories in a general, non-specific way (Hallford et al., 2021; Liu et al., 2013), also among children (Stewart et al., 2017). However, similar links have not been studied much in relation to earliest memories. Among adults, Acklin et al. (1991) did find links between depressive symptoms and negative thematic content and negative emotional tone in earliest memories. For Palestinian war-exposed children, Peltonen et al. (2017) found depressive symptoms to predict less positively valenced earliest memories, but found no link to specificity, when demographic factors, trauma exposure, and PTSD symptomatology were simultaneously considered. However, the extent to which negative mood or depressive symptoms specifically link to the features of earliest memories and in particular whether this differs from other autobiographical memories has not been examined.

Gender differences in the contents and features of children's earliest memories have been reported, though findings are inconclusive. Tõugu et al. (2022) found Estonian school-age girls to provide more specific and more emotion-laden earliest memories than boys. Among Palestinian children, female gender predicted more social memories, and less trauma-related and negatively-valenced memories (Peltonen et al., 2017). In contrast, among Canadian children and adolescents, girls reported more trauma- and transition-related and less play-related

earliest memories, but no differences were found in social orientation or emotional content (Peterson et al., 2005). Girls' autobiographical narratives in general have been found to be more socially contextualized and relational (Buckner & Fivush, 1998), and to involve more references to others across cultures (Han et al., 1998; Tõugu et al., 2014). Thus, to the extent that earliest memories reflect processes similar to other autobiographical storytelling, we would expect a gender difference in social orientation in them as well.

The current study

Here, my main aim is to test the putative distinct nature of memories reported as earliest as compared with other autobiographical memories from several years ago, among a representative sample of urban, Finnish 9–13-year-old children. The results will contribute to clarifying whether it makes sense to speak of self-reported *earliest memories* as a distinctive category of autobiographical memories among children of this age. They will also help clarify how current mood and gender are linked to the content and characteristics of children's earliest and other autobiographical memories. The findings have relevance for both research in children's autobiographical memory, and for possible clinical use of earliest memories in assessment or therapy.

First, the present study tested four preregistered hypotheses about similarities and differences between the self-reported earliest and other autobiographical memories of school-age children. Scant earlier findings suggested that earliest memories tend to be specific and that they often involve trauma and transitions. Accordingly, I set the following hypotheses:

1. A larger portion of earliest memories will be specific vs. general, as compared with other autobiographical memories.
2. A larger portion of earliest memories will involve trauma and transitions, as compared with other autobiographical memories.
3. An equal portion of earliest memories and other autographical memories will have a social orientation.
4. An equal portion of earliest memories and other autobiographical memories will involve positive or negative valence.

Second, based on a few previous studies (Acklin et al., 1991; Peltonen et al., 2017), it appears that earliest memories, too, might be affected by current mood, similar to other autobiographical memories. Accordingly, I set the following pre-registered hypotheses:

5. More positive mood will be associated with more positive earliest memories.
6. Less positive mood will be associated with more negative earliest memories.
7. Less positive mood will be associated with more general earliest memories.
8. Less positive mood will be associated with more trauma-related earliest memories.

Third, I hypothesized that

9. Girls will report more socially oriented earliest memories than boys.

Finally, I also explored other differences between earliest and other autobiographical memories in terms of their content and features and in how they link with mood and gender.

Method

Pre-registration

This study and its nine primary hypotheses were preregistered on the Open Science Framework (https://doi.org/10.17605/OSF.IO/WJZGE) before any work on the study or data collection commenced. The only departure from the pre-registration was the use of McNemar's tests for testing hypotheses 1–4 and Fisher's exact test for hypothesis 9, as they are more appropriate for this purpose than *t* tests.

Participants

The questionnaire was filled by 184 children from nine different classes at two schools. Eighteen children did not report an earliest memory or another autobiographical memory, or reported memories that were too brief or unclear to be adequately coded. Thus, the final sample for this study consisted of 166 participants, with 84 girls (50.6%) and 81 boys (48.8%). One child did not wish to state their gender. Their ages ranged from 9 to 13 ($M = 10.87$, $SD = 0.79$).

Procedure

Participants for the study were sought from two public lower primary schools in the city of Tampere, Finland. One school was selected for its convenient location near the university, and the other one was randomly selected (by cast die) from a list of all public lower primary schools in the city. Both schools were in central urban areas of Tampere, a major city and regional center of 250,000 inhabitants.

After permission from the schools' headmasters, the responsible teachers of all fourth and fifth grade classes in the

schools were contacted to enquire whether their classes could take part. Response and permission were obtained from nine school classes within the timeframe of data collection.

A questionnaire booklet was prepared and piloted among a small group of school-age children. Slight amendments and clarifications were made based on feedback from these pilot sessions. Trained undergraduate students in psychology then carried out the data collection under the supervision of the author. They visited each school class during school hours and organized the data collection in the classroom, lasting around 15–20 minutes per class. Each child received an identical booklet with information about the study on the front page, followed by questions about demographic information, their earliest and other autobiographical memory, and their mood. The participating children were asked to provide an earliest memory in writing using the following prompt "Some children have memories from the time they were very young. Try to think very hard and tell us, what is the oldest, earliest, or first thing you remember?" They were then provided half a page of space to write down their earliest memory. For another autobiographical memory, the following prompt was used:" People usually have many memories about their life. Please tell us another memory from many years ago." After data collection, the children were offered the chance to ask questions about and discuss the study, and the topic of memory and remembering in general.

Ethical issues

The study did not include elements that would have qualified it for ethical board assessment or required ethical approval as per guidelines of Tampere University. It complied with the 1964 Declaration of Helsinki and its later addenda. Permission to carry out the study was initially requested and received from the head of educational services of Tampere City, following the City's established protocol. Permission was then requested from the headmasters of the selected schools and finally class teachers. In the participating classes, informed consent was obtained from the children's guardians by providing information about the study to them well beforehand and offering them the possibility to prohibit the participation of their child, if they so wished. At the start of each data collection session, it was further explained to the children that participation was entirely voluntary and that they could choose not to respond or stop responding to questions at any time.

Measures

Both earliest memories and other autobiographical memories were coded for specificity, content, social orientation, and emotional valence by two separate coders. Both coders coded all memories. In cases of disagreement, the opinion of a third coder settled the final coding.

Specificity Following established practices in memory specificity research (e.g., Raes et al., 2007; Williams et al., 2007), the memories were coded as specific if they referred to one incident in time and place that likely lasted a maximum of 24 hours, and nonspecific (i.e., general) if they referred to a longer period, repeated events, semantic information, or other content. Interrater reliability was fair (Cohen's $\kappa = .56$ for earliest memories, $\kappa = .43$ for other memories).

Thematic content Following earlier research (Peltonen et al., 2017; Peterson et al., 2005), memories were categorized into five exclusive categories according to main thematic content. The categories were trauma and accidents (excerpts from the data: "My friend threw me against a coat rack, and I got a big cut on my forehead "and "The microwave dropped on my head"), transitions ("My sister was born and I held her for the first time "and "My parents told me they were divorcing"), play ("We drove pedal cars around the yard with my friend.", "I was on a swing in the local playground"), visits ("My family traveled to Thailand when I was two", "First time visiting the amusement park"), and other events. Interrater reliability was good ($\kappa = .65$ for earliest memories, $\kappa = .69$ for other memories).

Social orientation Memories were coded as social if they featured any indication of interaction with other people and as individual if they did not refer to other people at all or only referred to other people as passively present, not in any way interacted with. Interrater reliability was good ($\kappa = .71$ for earliest memories, $\kappa = .72$ for other memories).

Emotional content Memories were coded as positive if they included words clearly displaying or referring to positive emotions (e.g., happy, glad, laughing, celebrating) and negative if they included words clearly displaying or referring to negative emotions (e.g., sad, angry, crying, mourning). Positive or negative emotional content was also coded for memories that included smileys or emoticons (e.g., "=)" and ":(". Some memories included both negative and positive emotional words and were coded as both. As in Peterson et al. (2005), coding for emotional content was strict in the sense that memories with thematic content typically thought to be negative in emotional tone (e.g., falling down stairs, grandmother dying) were not coded as negative if they included no word indicating any emotion. The same was true for thematically likely positive memories (e.g., "I got my first dog.") which included no words indicating emotion. Interrater reliability was good ($\kappa = .81$ / .87 for negative and

positive emotions in earliest memories, κ = .71 / .75 for other memories).

Depressive symptoms The 18-item Depression Self-Rating Scale for Children (DSRS; Birleson, 1981) was used in Finnish translation to measure depressive symptoms. Children evaluated on a three-point scale (0 = mostly, 1 = sometimes, 2 = never) how often they had experienced each described feeling or situation. Negative items were reversed for scoring. The sum score was used to indicate depressive symptoms, with a theoretical range of 0–36. This scale was selected because it has been used in previous research in a variety of cultural settings and does not include particularly distressing items or wording. Internal consistency in this sample was fair to good (α = .76, ω_{total} = .80).

Emotional well-being Three items from the Mental Health Continuum – Short Form (MHC-SF; Keyes, 2005) were used to assess emotional well-being. The children answered on a six-point scale (1 = never, 2 = once or twice, 3 = once a week, 4 = two or three times a week, 5 = almost every day, 6 = every day) how often during the last month they had felt 1. happy, 2. interested in life, and 3. content with life.

Current and life happiness Two simple distance scales were used to measure current and life happiness. The children were asked to mark 1. How happy (as in cheerful) they were right now, on a vertical line stretching from "Perfectly sad – 0" to "Completely happy/cheerful – 100" and 2. How happy (as in fortunate, satisfied) they were in their life in general on a vertical line stretching from "Perfectly unhappy – 0" to "Perfectly happy/satisfied – 100". For both measures, the distance in centimeters from the bottom of the scale to the point the children had marked was divided by the scale's total height to arrive at a percentage value.

Statistical analyses

A maximum of three items on the DSRS and one item on the MHC-SF were replaced with personal mean imputation when calculating sum and mean scores. Finally, data were missing for 1/169 participants on gender and number of siblings, 6/166 for depressive symptoms, 2/166 for emotional well-being, 4/166 for current happiness, and 4/166 for life happiness. Pairwise deletion was used for these missing data, so that the exact sample size differed slightly in different analyses.

McNemar's tests were used to compare the contents, specificity, social orientation, and emotional valence of earliest and other autobiographical memories. Fisher's exact test was used for gender differences. For examining the links between mood and features of memories, a latent negative mood variable was constructed, with depressive symptoms, emotional well-being, current happiness, and life happiness as its indicators. This latent variable was then correlated to the different features of earliest and other autobiographical memories. Maximum likelihood estimation with the *lavaan* 0.6–8 R package (Rosseel, 2012) was used for these analyses. All analyses and data management were carried out using R 3.2.3. R script used to carry out analyses is attached as Supplementary Material. The dataset analyzed in the current study is available in anonymized format from the author on reasonable request.

Results

Descriptive statistics

Table 1 presents the contents, emotional valence, specificity and social orientation of the children's earliest and other autobiographical memories. Table 2 further presents a correlation table between demographic variables, features of earliest and other autobiographical memories, and measures of mood and happiness.

Differences between earliest and other memories

I found no evidence for pre-registered hypotheses one and two, as there was no difference in specificity between earliest and other autobiographical memories (75.3% vs. 77.8%, McNemar's $\chi^2(1) = 0.19$, $p = .665$), and no difference in

Table 1 Features of self-reported earliest and other autobiographical memories of school-age children

	Earliest memory		Other memory	
	n	%	*n*	%
Specificity				
Specific	125	75.3	129	77.8
General	41	24.7	37	22.3
Thematic content				
Trauma or accident	19	11.4	23	13.9
Transition	12	7.2	18	10.8
Play	40	24.1	23	13.9
Visit	21	12.7	39	23.5
Other	74	44.6	63	38.0
Social orientation				
Social	87	52.4	105	63.3
Individual	79	47.6	61	36.7
Emotional content				
Positive	14	8.4	23	13.9
Negative	10	6.0	14	8.4
None	142	85.5	131	78.9

N = 166. Some memories coded both negative and positive

Table 2 Correlations between features of self-reported earliest and other memories, demographic factors, and indicators of mood and happiness among school-age children

Variable	*M*	*SD*	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1. Female gender																				
2. Age	10.87	0.79	.08 [−.07, .23]																	
3. Number of siblings	1.61	1.10	.09 [−.07, .24]	.13 [−.03, .27]																
4. Current mood	76.02	19.16	.03 [−.12, .19]	.20** [.05, .35]	.12 [−.03, .27]															
5. Life happiness	79.33	18.87	−.11 [−.26, .05]	.13 [−.03, .28]	.06 [−.09, .21]	.48** [.35, .59]														
6. Depressive symptoms	7.32	4.23	.14 [−.02, .28]	−.16* [−.31, −.01]	−.11 [−.26, .05]	−.48** [−.59, −.34]	−.59** [−.69, −.48]													
7. Well-being	5.12	0.79	.04 [−.12, .19]	.30** [.15, .43]	−.01 [−.17, .14]	.49** [.36, .60]	.57** [.45, .66]	−.54** [−.64, −.42]												
8. EM Specific	0.75		.01 [−.14, .16]	−.09 [−.24, .06]	−.17* [−.31, −.01]	.07 [−.08, .23]	−.02 [−.17, .14]	−.05 [−.21, .10]	−.03 [−.18, .13]											
9. EM Social	0.52		.21** [.06, .35]	−.03 [−.18, .12]	−.04 [−.19, .12]	.03 [−.12, .19]	.11 [−.05, .26]	−.03 [−.19, .12]	.02 [−.13, .18]	.15* [.00, .30]										
10. EM Positive	0.08		.17* [.02, .31]	−.03 [−.19, .12]	−.01 [−.16, .14]	.11 [−.04, .26]	.03 [−.12, .19]	−.09 [−.25, .06]	.05 [−.11, .20]	−.18* [−.32, −.03]	.03 [−.12, .18]									
11. EM Negative	0.06		.10 [−.06, .25]	−.09 [−.24, .07]	−.00 [−.16, .15]	−.06 [−.21, .10]	−.03 [−.19, .12]	.00 [−.15, .16]	−.12 [−.27, .03]	.09 [−.07, .24]	.14 [−.01, .29]	−.08 [−.23, .08]								
12. EM Trauma	0.11		−.03 [−.18, .13]	.01 [−.14, .16]	−.13 [−.28, .02]	.01 [−.15, .16]	−.12 [−.27, .03]	.19* [.04, .34]	−.06 [−.21, .09]	.16* [.01, .31]	−.04 [−.19, .12]	−.11 [−.26, .04]	.15 [−.00, .29]							
13. EM Transition	0.07		.04 [−.11, .19]	−.07 [−.22, .08]	−.11 [−.26, .04]	.04 [−.11, .20]	−.03 [−.18, .13]	.02 [−.13, .18]	−.12 [−.27, .03]	.11 [−.05, .25]	.03 [−.12, .18]	−.08 [−.23, .07]	−.07 [−.22, .08]	−.10 [−.25, .05]						
14. OM Specific	0.78		.08 [−.07, .23]	−.14 [−.29, .01]	−.06 [−.21, .10]	.06 [−.10, .21]	−.02 [−.18, .13]	.05 [−.11, .20]	.06 [−.09, .21]	.20* [.05, .34]	.04 [−.11, .19]	.01 [−.15, .16]	.01 [−.14, .17]	.19* [.04, .34]	.04 [−.12, .19]					
15. OM Social	0.63		.25** [.10, .39]	.10 [−.05, .25]	.08 [−.07, .23]	.04 [−.12, .19]	.00 [−.15, .16]	.01 [−.14, .17]	.07 [−.08, .23]	−.03 [−.18, .12]	.40** [.26, .52]	.05 [−.10, .20]	.14 [−.01, .29]	−.00 [−.15, .15]	−.12 [−.27, .03]	.01 [−.14, .16]				
16. OM Positive	0.14		.12 [−.04, .26]	.06 [−.09, .21]	.09 [−.06, .24]	.15 [−.01, .29]	.10 [−.06, .25]	−.02 [−.18, .14]	−.03 [−.18, .12]	−.05 [−.20, .10]	.10 [−.05, .25]	.19* [.04, .33]	−.10 [−.25, .05]	−.03 [−.19, .12]	.02 [−.13, .17]	−.12 [−.27, .03]	.16* [.01, .31]			
17. OM Negative	0.08		−.01 [−.16, .15]	.02 [−.13, .17]	.11 [−.05, .26]	−.03 [−.18, .13]	.04 [−.12, .19]	.07 [−.09, .22]	−.00 [−.16, .15]	−.08 [−.23, .08]	.03 [−.12, .18]	−.01 [−.17, .14]	−.08 [−.23, .08]	.10 [−.06, .24]	.08 [−.07, .23]	−.05 [−.20, .11]	−.08 [−.23, .07]	.00 [−.15, .16]		
18. OM Trauma	0.14		−.09 [−.24, .06]	.02 [−.13, .17]	.14 [−.01, .29]	.04 [−.11, .19]	−.01 [−.16, .15]	−.02 [−.17, .14]	.05 [−.10, .20]	.07 [−.09, .22]	−.11 [−.25, .05]	.00 [−.15, .16]	−.03 [−.18, .12]	.18* [.03, .33]	.16* [.01, .30]	.17* [.02, .32]	−.24** [−.38, −.09]	−.16* [−.31, −.01]	.32** [.17, .45]	
19. OM Transition	0.11		.07 [−.08, .22]	.01 [−.15, .16]	.04 [−.12, .19]	.07 [−.09, .22]	−.04 [−.20, .11]	.07 [−.09, .22]	−.03 [−.18, .13]	−.02 [−.18, .13]	−.02 [−.17, .14]	.03 [−.12, .18]	−.09 [−.24, .06]	−.06 [−.21, .09]	.13 [−.03, .27]	−.09 [−.24, .06]	.11 [−.05, .25]	−.03 [−.18, .13]	−.04 [−.19, .12]	−.14 [−.29, .01]

Values in square brackets indicate the 95% confidence interval for each correlation. * $p < .05$. ** $p < .01$. EM = earliest memory, OM = other autobiographical memory. Variables 1, 8–19 are binary

the share of memories involving trauma (11.4% vs. 13.9%, $\chi^2(1) = 0.30$, $p = .584$) nor transitions (7.2% vs. 10.8%, $\chi^2(1) = 1.04$, $p = .307$). I found evidence against hypothesis three, as a significantly larger share of other autobiographical memories had a social orientation (52.4% vs. 63.3%, $\chi^2(1) = 5.87$, $p = .016$). I found no evidence against hypothesis four, as there was no significant difference in the share of memories involving positive (8.4% vs. 13.9% $\chi^2(1) = 2.37$, $p = .124$) nor negative emotions (6.0% vs. 8.4%, $\chi^2(1) = 0.378$, $p = .540$).

Links between mood and gender and features of earliest memories

I found no evidence for hypotheses 5–8, as negative mood did not correlate significantly with positive emotional content ($r = -.098$, $p = .273$), negative emotional content ($r = .075$, $p = .394$), or specificity of earliest memories ($r = -.030$, $p = .731$), nor with content featuring trauma or accidents ($r = .15$, $p = .089$). I did find evidence for hypothesis nine, as girls reported more earliest memories with a social orientation than boys (63.1% vs. 42.0%, $OR = 2.35$, 95% CI [1.21, 4.64], $p = .008$).

Exploratory analyses

Exploring other differences in earliest and other autobiographical memories, more earliest memories had play content (24.1% vs. 13.9%, $\chi^2(1) = 5.95$, $p = .0147$), while fewer earliest memories had visit or trip related content (12.7% vs. 23.5%, $\chi^2(1) = 7.23$, $p = .0072$) compared with other autobiographical memories. Negative mood did not significantly correlate with the specificity, social orientation, positive or negative emotional content, or thematic content of other autobiographical memories, similar to earliest memories.

Girls had clearly more memories with a social orientation than boys in other autobiographical memories, too (75.0% vs. 50.6%, $OR = 2.91$, 95% CI [1.44, 5.99], $p = .0013$). Girls also had more positive emotional content in earliest memories (13.1% vs. 3.7%, $OR = 3.89$, 95% CI [0.97, 22.56], $p = .048$), but a similar significant difference was not detected in other autobiographical memories. No significant gender differences were detected in the specificity, negative emotional content, or other thematic content of earliest or other autobiographical memories (see Supplementary Table 1 for details).

Discussion

This study examined possible differences between the self-reported earliest and other autobiographical memories of school-age children, and associations between mood and gender on the one hand and features of earliest memories on the other hand. It found few differences between earliest and other autobiographical memories, and what was found did not support the preregistered hypotheses. I hypothesized based on scant earlier research that earliest memories might be more specific and involve more trauma and accident or transition related content, but did not find this to be the case. As hypothesized, there were no differences between the emotional content of earliest and of other autobiographical memories, and indeed, explicit emotional content was rare in both categories of children's memories. Against my hypothesis, I did find a significant difference in social orientation, so that fewer earliest memories than other autobiographical memories had a social orientation. That is, more earliest memories were about solitary activities. Regarding links with mood and gender, the study did not find evidence for hypotheses about mood-congruent recall of earliest memories, as no significant links between (negative) mood and features of earliest memories was found. The study did find evidence for a gender difference in social orientation of earliest memories, as girls more often reported social earliest memories.

In exploratory analyses, the gender difference in social orientation was also found in other autobiographical memories. Girls also had more positive content in their earliest, though not other, memories. In terms of thematic content, more earliest memories featured play-related content, but more other autobiographical memories had visit or trip-related content. Other differences between the two types of memories or other gender differences were not found.

Overall, the findings suggest that when school-age children are probed for earliest memories (in writing), they tend to provide descriptions of specific events with little explicit emotional content. This is largely in line with earlier research in both similar (Tõugu et al., 2022) and quite different cultural environments (Göz et al., 2017; Peltonen et al., 2017; Peterson et al., 2005). The contribution of this study is that other reported early autobiographical memories do not differ from those children report as their earliest in these respects.

These Finnish children further provided mostly social memories involving other people. The social orientation of earliest and other memories correlated even more than other features of the memories, which may reflect individual differences in remembering and reporting events or the fact that one social memory brought to mind another social memory. Here, a significant, though not dramatic, difference was noted between earliest (52% social) and other (63%) memories. This difference could reflect what the memories were typically about and how they were selected for reporting among many possibilities. Whereas the main criterion for reporting an earliest memory was likely that it was from a long time ago, for another memory, the children appeared

to have selected more unusual or atypical events, considering that nearly half of them concerned traumas or accidents, transitions, or visits or trips. Especially the larger share of visit or trip memories may explain why other autobiographical memories were even more social on average.

At a little over 50 %, the share of earliest memories with a social orientation was similar to that identified among Palestinian children in a study that used a very similar approach for querying earliest memories (Peltonen et al., 2017). On the other hand, it was clearly higher than rates reported among Canadian school-age children (Peterson et al., 2005, 2009) and somewhat lower than those of Chinese (Peterson et al., 2009) and Turkish children (Göz et al., 2017), in studies using somewhat different approaches. Wang (2001, 2004, 2021) has argued that features of early memories reflect cultural differences in views of the self and self-goals. In this light it is interesting to note that while Finnish culture is generally rated as more individualistic than collective (although in a less extreme way than Canada) (e.g., Hofstede Insights, n.d.), the level of social orientation in Finnish children's early memories was closer to that reported in the more collectivistic cultures. Sociocultural accounts of memory development suggest that cultural values are typically transmitted and highlighted by parents when engaging in shared reminiscing about past events (Fivush, 2011, 2019). To my knowledge, such reminiscing has not been studied in Finland. In neighboring countries research has found significant differences between the ways Estonian and Swedish mothers reminisce with their children (Tulviste et al., 2015), so extrapolating to the Finnish context is difficult.

That girls reported more social memories and more positive earliest memories is in line with research among Estonian (Tõugu et al., 2022) and Palestinian children (Peltonen et al., 2017), but differs from the findings of Peterson et al. (2005) among Canadian children, where no gender differences were noted. The findings of this study and those focusing on children's memories more generally (Buckner & Fivush, 1998; Tõugu et al., 2014) suggest that gender differences in the social nature of reported memories are equally present in earliest and other autobiographical memories across cultures. Findings on emotional content are less consistent.

These differences could reflect gendered socialization or reminiscing patterns. However, although again no studies are available from Finland, findings from Denmark, a similarly egalitarian Nordic country, suggests no differences in how parents reminisce with young boys and girls, at least about emotional events (Svane et al., 2022). Meta-analyses on the topic have also failed to find differences in how parents reminisce with boys and girls (Aznar & Tenenbaum, 2020; Waters et al., 2019). It may be that other explanations are needed for observed gender differences in social orientation and emotionality of memories.

Overall, I found no evidence for mood-congruent recall in earliest and other autobiographical memories overall. This is somewhat surprising, but it may be that typical mood variations in generally happy children are not strong enough to be clearly reflected in the memories they report. Looking at the individual measures of mood, a correlation statistically significant at $p < .05$ was found between more depressive symptoms and a larger likelihood of reporting an earliest memory with trauma or accident-related content. This single, relatively weak correlation provides little evidence, however. Peltonen et al. (2017) did find depressive symptoms in particular to predict less positively valenced memories among Palestinian children, and some older studies have found depressive symptoms to be reflected in the earliest memories of adults as well (e.g., Acklin et al., 1989). This could tentatively suggest that possible effects of mood on what is recalled and reported from early childhood may be limited to frank depressive symptoms.

Regarding thematic content, it is interesting that it was play-related events that were more common in earliest versus other autobiographical memories. Although the children rarely described these memories in explicit positively charged terms, this seems to suggest that when they thought back to their earliest childhood, quite pleasant things often came to their mind. This might again reflect their generally positive outlook on life or well-being, as their levels of depressive symptoms were generally low and levels of emotional well-being high, and they visually estimated their current happiness at 76/100 and life happiness at 79/100 on average. Individual variations in mood or depressive symptoms were not significantly linked to higher likelihood or reporting play memories, however.

Most play memories seemed to be of quite mundane, everyday events. This, and the high number of idiosyncratic, but generally also ordinary, memories coded as *other* indicate that children's earliest memories do not typically relate to major, life-changing, or seminal events, as others too have found (Peterson et al., 2005). This again suggests the main cue that children use when selecting the earliest memory to report may be simply that it happened a long time ago. That play memories come to mind easily could also reflect school-age children's conception of what small (pre-school) children do – they mostly play.

Strengths and limitations

The strengths of the study include a fairly representative sample of urban, school-age children in Finland, and preregistration of the study and its primary hypotheses. At the

same time, its findings cannot be broadly generalized beyond this context to other age groups or cultural environments.

A major limitation of the study is that both earliest and other autobiographical memories were self-reported by the participating children in a simple questionnaire. As such, I did not study the actual earliest events the children could remember, but memories they chose to self-report as their earliest in this specific context. Further, though I did not study the age of earliest memory here, Peterson (2021) has shown that requesting just a single *earliest memory* will tend to skew the findings to later ages, as many children are able to provide even earlier memories if several memories are asked for. If the intent of research or assessment is to gauge how far back individuals can in fact remember their lives, asking for several early memories, or using memory fluency or timeline tasks appears preferable.

Memories were also reported in writing, likely resulting in shorter and simpler descriptions than might have been produced through oral questioning, especially considering the age of the children. This is the reason I did not code for amount of information or detail. Oral questioning could have also provided earlier earliest memories (Peterson et al., 2010). Because of the written format, my findings here are not fully comparable to studies where oral interviews were used (e.g., Peterson et al., 2005; Tõugu et al., 2022).

Conclusions

Most recent thinking has rejected lofty psychoanalytically inspired ideas about earliest memories as "retrospective inventions developed to express psychological truths" (Mayman, 1968, p. 304) or "structures within the ego" (Langs, 1967, p. 184). Current evidence suggests that they generally relate to actual, early events, often quite ordinary ones. Still, as a person typically has many events from which to choose an "earliest" one to report when asked to do so, current concerns or more general proclivities, attitudes, personality features and so on could affect what people end up reporting. However, this study and other research so far suggests that there are no radical differences between earliest and other autobiographical memories that would indicate that they in particular reflect or reveal such traits. Indeed, earliest memories may be typically, if anything, about even more mundane, everyday events than other freely reported early childhood memories. Any research or clinical application of *the earliest memory* should consider that when we ask for, at least a child's, earliest memory, what we get is probably one example of a pool of possible early experiences, the selection of which may be more affected by the immediate context and circumstances of inquiry than anything more profound or revealing.

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