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Infantile amnesia and gender: does the way we measure it matter?

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Abstract

Gender differences favoring females have frequently been found in investigations of infantile amnesia (IA) in adults but not in children, both when individuals are asked for their earliest memory and when memory fluency tasks are used (time-limited recall of multiple early memories). However, adults are typically assessed in groups in a paper-and-pencil format whereas children are individually and orally interviewed. The present study investigated whether this difference in methodology mattered. University students were given IA tasks in one of these two ways, and gender differences were only found for the group/written task format. Gender differences in motivation may be important.

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1. Introduction

The phenomenon of infantile (or childhood) amnesia is well established in the literature – i.e., the absence or scarcity of memories about very early life events (see reviews in Bauer, 2007, and Rubin, 2000). A range of factors have been posited to play a role in infantile amnesia, including the emergence of a cognitive sense of self, acquisition of language skills, neurobiological maturation, and metacognitive skills such as theory of mind (see review in Nelson & Fivush, 2004). Another theoretical account that has received considerable recent attention emphasizes social interaction between parents and children, and in particular, memory-sharing – the social cultural developmental theory developed by Nelson and Fivush (2004). This theory states that memory-talk, especially talk which is elaborative and extensive between parents and children, fosters children's memory skills. And better memory skills in turn are likely to lead to earlier memories, i.e., lead to an earlier termination of infantile amnesia. In addition, a number of investigators have suggested that memory talk is especially common between girls and their mothers both when children are preschoolers (Reese, Haden, & Fivush, 1996) and adolescents (Larson, Richards, Moneta, Holmbeck, & Duckett, 1996). According to this theoretical account, females are predicted to have earlier and more numerous memories from their early lives than are males.

Overall, for people of Western European descent (the population investigated the most), the average age of a person at the time of his or her first memory is 3.5 years. Almost all investigations of infantile amnesia have been

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conducted with adults, and gender differences favoring women are frequently found. This is true for tasks in which participants are asked to recall their single earliest memory (MacDonald, Uesiliana, & Hayne, 2000; Mullen, 1994; Wang, 2003) and when they are asked to recall as many of their early memories as they can in a time-limited task (Wang, Conway, & Hou, 2004). This latter task is termed a memory fluency task. Cross-cultural comparisons have also frequently found gender differences favoring women, although not always, particularly in cultures that tend to devalue women.

In contrast, recent investigations of infantile amnesia in children have not found parallel gender differences. For example, no gender differences have been found for the age of children's single earliest memory (Peterson, Grant, & Boland, 2005; Peterson, Wang, & Hou, 2009; Tustin & Hayne, in press). Nor have gender differences been found in the number of early memories recalled when the memory fluency task is used (Peterson et al., 2009). Furthermore, with both of these tasks, gender differences did not emerge as children got older. For example, in a study conducted by Peterson et al. (2005), gender differences were not found among children between the ages of 6 and 19 years. Presumably, as children got older they should have increasingly demonstrated the same gender difference found in adults, but they did not. Why not?

It is possible that the reason gender differences have been found in adult samples but not in children is that the tasks are administered differently. That is, the answer to this conundrum may lie in how infantile is assessed. When infantile amnesia is studied in adults, research participants typically provide memories in written format in group-administered tasks. Thus, when doing a memory fluency task, adult participants are responsible for writing down summary notes for each memory recalled, and for the earliest memory task, they write down a description of that memory themselves. However, children are typically interviewed individually and orally, primarily to avoid the complicating factor of child writing skills. Although it is generally assumed that such methodological differences should not affect findings, this assumption may be unwarranted. The purpose of the present study is to investigate infantile amnesia in adults who are given the same tasks, but half of them are given the task in the traditional written format and half are interviewed orally

2. Method

Participants were 160 university students from Memorial University of Newfoundland in Newfoundland, Canada, divided into two groups of 80 (mean age = 21.9 years, $SD = 2.4$ years). Most were Caucasian with a European background (mostly English or Irish). Half of each group were female. Adults in each group were offered a \$100 draw as incentive for participation. Adults in group 1 were interviewed separately by a female interviewer. At the start of the interview, she explained that they would be timed for 4 minutes during which time they would be required to recall as many early memories as possible. They were to "think way back to when you were really young, before you started school" and to think of things that happened to them. They were then asked to tell the researcher something about each memory in just a few words, and then to think of another memory. The interviewer then started the stop watch. During the 4 minute recollection period the interviewer recorded each memory. Once the 4 minute recall period was over, the researcher went back to each memory with the participant and asked them to identify their age at the time of the event. They were asked to provide how old they had been in years, and the researcher asked ancillary questions that would help her (in conjunction with knowing the adult's date of birth) determine their age in months as well as years (e.g., Was it summer or winter? Was it near a special occasion like Christmas, Easter, Halloween or their birthday?). At the end of the interview, they were asked what their earliest childhood memory was. Adults in Group 2 had the same instructions as those in Group 1, except that the tasks were administered in groups during class time. The participants wrote down their own notes on their memories, and after the timed period, they returned to each of their memories to describe their age at the time of each, with the ancillary questions written on the form to help them determine their age. They then wrote a description of their earliest memory.

3. Results

The number of memories produced in the memory fluency task by adults in the two groups (written/group administration versus oral/individual presentation of tasks) is shown in Table 1. A one-way ANOVA (gender the between-subjects factor) found that in the group-administered, written task women recalled significantly more early memories than did men, $F(1, 78) = 5.09, p = .027, \eta^2 = .061$. In comparison, an ANOVA calculated on the sample of adults who gave their memories orally to a researcher found no gender difference, $F(1, 78) = 0.10, p = .752$. In addition, participants recalled more memories when they were individually interviewed.

Table 1. Number of Memories Recalled

Groups	Women		Men	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Written/group task	8.7	4.0	6.8	3.3
Oral/individual task	10.0	4.6	9.7	4.6

The age (in months) of participants in each group at the time of their earliest memory is shown in Table 2. A one-way ANOVA (gender the between-subjects factor) found that in the group-administered, written task, women recalled significantly more early memories than did men, $F(1, 78) = 3.98, p = .049, \eta^2 = .049$. However, there were no gender differences for the sample of adults who orally described their earliest memory individually to a researcher, $F(1, 78) = 0.16, p = .898$. Also noteworthy is the fact that the age of earliest memory was considerably younger when the task was administered orally and individually.

Table 2. Age at Earliest Memory

Groups	Women		Men	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Written/group task	38.6	9.9	43.3	10.8
Oral/individual task	31.1	11.1	31.4	11.6

3. Conclusions

The method of administration of both the memory fluency task and the age-at-earliest-memory task made a significant difference in terms of whether or not gender differences were found. For both tasks, gender differences were found for the group that had the tasks administered in a group setting, with the participants writing down notes on their own memories. In contrast, there were no gender differences for either task when the participants were orally interviewed by a researcher, who also took notes on their memories.

A second important finding is that both women and men (but especially men) recalled more memories as well as had an earlier first memory when they were individually interviewed. A substantial body of research has shown that the average age of first memory is around 3.5 years (i.e., 42 months) for individuals of Western European descent. When participants were given the earliest memory task in the traditional written form, their data are consistent with this typical age. However, when individually interviewed, the age of first memory is closer to 2.5 years. In fact, for men interviewed individually, their earliest memory was a full year earlier than for men given the more typical group-administered task. This is a very substantial difference.

These findings suggest, first, that gender differences are more tied to methodology than has previously been thought. In fact, we could find no studies suggesting that the manner of task presentation made a difference in terms of whether or not gender differences are found. Rather, a summary of the extant research published prior to 2000

found that the type of task used to assess infantile amnesia made no difference (Rubin, 2000). However to our knowledge, no direct comparison of written/group versus oral/individual task presentation had yet been done.

The findings also suggest that estimates of the age of first memory may differ depending upon the method used to elicit them. Prior research has suggested that the age of first memory seems to differ depending upon the content of the remembered event, with memories of hospital visits or sibling births being earlier than memories of other sorts of content (Usher & Neisser, 1993; Eacott & Crawley, 1998) and even how that content is scored makes a difference (Davis, Gross, & Hayne, 2008). However, whether participants are individually interviewed or provide their memory responses in a non-interactive paper-and-pencil format also seems to make a difference.

The social cultural developmental theory developed by Nelson and Fivush (2004) posits a relationship between the amount and elaboration of parent-child memory talk and the offset of infantile amnesia, and because some researchers have documented more extensive memory talk between mothers and daughters than between mothers (or for that matter, fathers) and sons, we expected gender differences favoring women in the current tasks. Indeed, differences in the amount and type of memory talk between parents and their daughters versus sons has been proposed as the explanation for the gender differences that had been previously found. The current study suggests that the relationship between gender and infantile amnesia is not as straightforward as previously proposed.

Finally, these findings suggest that gender in and of itself may not be as important as an interaction between gender and other factors. For example, it may be that motivation differs between males and females when an impersonally administered task is given, but when someone is confronted face to face with an interviewer who seems to care about how well you are doing, motivation is greater for both genders, and men in particular may try harder to search their memory. After all, trying to recall memories from so long ago is a very effortful process, and men may be less inclined to invest that effort in impersonal settings. The moderating role of factors such as motivation may explain why gender differences are not always found. Thus, an important task for future research is to provide a delineation of these moderating factors and what role they play. It may well be that men and women do not differ very much in terms of the phenomenon of infantile amnesia; rather, differences may only appear under certain conditions. Because group administration of tasks in written form is easiest, prior research has mostly used this method, but it may not have provided us with an accurate picture of gender and infantile amnesia.

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