



## Gender Differences in Episodic Encoding of Autobiographical Memory<sup>☆</sup>



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Gender differences in autobiographical memory have been widely reported; in this study, those differences were considered with regard to episodic and semantic memory, and encoding and retrieval. Participants reported memory narratives of two events that had occurred within a day of the report. They were re-tested on them 10–13 weeks later. Narratives were content coded for internal and external details, a method meant to reflect episodic and semantic memory, respectively. Results indicate gender differences in internal details at Time 1 that remained stable at Time 2, suggesting that encoding is the more promising approach to understanding gender differences in this domain and showing consistency with previous research and theory. Gender differences in external details were minimal, but implicated encoding when present.

### General Audience Summary

Gender differences in autobiographical memory have been widely reported, often in the guise of women recalling more detail than men. According to some theories, these differences may reflect a difference in the general style of taking in information, rather than how much people forget over time. Thus, in this study, I tested whether women retain more information than men over time, or if they simply store more information to begin with. Participants in this study reported two events that had occurred within a day of their participation in the study. After 2–3 months, they were given a surprise recall test for these same events. Women reported more details relating to what happened in each event (e.g., actions, sights, sounds, thoughts) at the first time point, and the amount of detail decreased at similar rates for both women and men. Taken together, these results suggest that women store more of this type of information than men and that how information is first taken in may be more central to understanding gender differences in memory, compared to processes involved in forgetting.

*Keywords:* Gender differences, Episodic memory, Encoding and retrieval, Autobiographical memory

Gender differences emerge regularly in autobiographical memory studies, especially in domains that include women reporting events with more richness of detail (Nahari & Pazuelo, 2015), interpretive detail (Pasupathi & Wainryb, 2010), memory for affect (Bohanek & Fivush, 2010) and even basic factual details (Grysman, Fivush, Merrill, & Graci, 2016); Grysman and Hudson (2013) outlined various trends regarding studies that do and do not report gender differences in autobiographical memory research, and noted that these differences have been particularly reliable in studies that include narrative data but less so in questionnaire data (see also Grysman, Merrill, & Fivush,

2016). The presence of gender differences across multiple autobiographical memory studies raises the question of whether they can be linked to more basic-level constructs in memory, such as encoding and retrieval or semantic and episodic memory. In pinpointing the particular memory processes for which gender is implicated, a more precise, and eventually more comprehensive, understanding of these gender differences can be obtained.

### Encoding Versus Retrieval

Because autobiographical memory studies often use prompts that elicit long-term memories from participants' lives, they are

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imprecise in assessing the stage of memory processing at which gender differences emerge. When women recall more details than men (e.g., Peterson, 2011; Pillemer, Wink, DiDonato, & Sanborn, 2003; Seidlitz & Diener, 1998), it is unclear whether they encoded or retrieved more details. Theoretical approaches to these gender differences favor an encoding explanation. Nelson and Fivush (2004) argue that maternal reminiscing is central to children's early autobiographical memory development. Specifically, mothers reminisce in more elaborative ways with daughters than with sons (Brody & Hall, 1993; Fivush, Berlin, Sales, Mennuti-Washburn, & Cassidy, 2003), establishing tendencies to think about memories such that details relating to emotion, internal states, and subjective perspective are internalized early and more substantially in girls than in boys. This approach has been supported by longitudinal findings (Reese, Jack, & White, 2010) and cross-cultural comparisons (Wang, 2004), but has rarely examined these conversations at multiple time points. By linking gender differences to early conversations with parents, the sociocultural approach (Nelson & Fivush, 2004) emphasizes learned tendencies to elaborate on events as they are first encoded, enabling enhanced recall later on.

Wang (2013) prompted participants for events that had occurred within the past 30 min and gave them a surprise recall task a week later. She found gender differences at both time points, with no reduction in the effect size from encoding to retrieval. These findings suggest that, because the first report happened so soon after the actual event, gender differences found at time 1 are likely due to encoding; because there was no difference in the effect size a week later, those initial differences were preserved. Wang (2009) has similarly noted that cross-cultural differences between Asians and Euro-Americans may also be attributed to encoding factors, strengthening the support for this prediction. The current study aimed to replicate Wang's results (2013) at different time frames to test whether the effect would persist over a longer delay from encoding to retrieval, as most autobiographical memory narratives reported in empirical studies are more than one week old.

### Semantic Versus Episodic Memory

Wang (2013) explained the gender differences in her study by connecting them to those commonly found in episodic memory (see Herlitz & Rehnman, 2008), and Grysmann and Hudson (2013) have similarly raised the possibility of a link between trends in the autobiographical and episodic memory literatures. The current study aimed to more closely assess an episodic memory approach, inasmuch as is possible using behavioral measures, by coding narrative content separately for information suggestive of episodic and semantic memory. One previous study has explored gender differences on narrative content with a similar focus on episodic and semantic memory. Fuentes and Desrocher (2013) employed the Autobiographical Interview (Levine, Svoboda, Hay, Winocur, & Moscovitch, 2002) and, although they found no gender differences in free recall, upon specific probing, they found that women used more internal but not external details than men in their memory narrative content.

Internal details are those that pertain to the event being described and can be located in time and space within that event. In other words, these details are meant to capture only elements of a memory narrative that refer to episodic re-experiencing of the event. Details that pertain to factual knowledge, other related events, and repetitions, are referred to as external details, and meant to capture semantic details included in recall (see Levine et al., 2002).

The distinction between episodic and semantic memory (Tulving, 1972) has been usefully employed as a guide to analyze memory narrative content by examining internal and external details. Levine et al. (2002) analyzed autobiographical memory narrative content in an aging population. They found age-related declines in internal details, but no age-related declines in external details, matching models of cognitive aging (e.g., West, 1996) that emphasize more decline in episodic than semantic memory.

Considering semantic and episodic memory is important because both types of memory are implicated and combined in autobiographical remembering (Conway & Pleydell-Pearce, 2000). Furthermore, if gender differences predominate in episodic details, as is predicted, this would narrow the domain of gender differences in autobiographical memory, enabling a more comprehensive theory of these differences.

### The Present Study

Participants in the current study reported two events that occurred the day of, and within 24 h of reporting, respectively. These two event reports were separated by approximately one week. After a delay of 10–13 weeks from the first event report, participants completed a surprise recall task of both events. This time frame for delay before a recall task was considered ideal because it would allow for substantial forgetting, which was anticipated because the events reported had just occurred at the first memory report, decreasing the likelihood that they would be highly memorable. Conversely, Wang's (2013) surprise recall task occurred after only one week and may not have allowed sufficient time for forgetting. Memory narratives from both time points were content coded using the methods delineated by Levine et al. (2002). I hypothesized that women would report memory narratives with more internal but not more external details than men, and that this effect would be present at the first time point, suggesting an explanation more closely linked to encoding than to retrieval.

## Method

### Participants

A total of 95 participants took part in all stages of this study. One person completed only the first of two memory prompts at the second time point, thus leading to 94 participants in some analyses and 95 in others, including 41 men and 54 women. Age ranged from 18 to 22 ( $M = 19.51$ ,  $SD = 1.14$ ). Seventy-three participants self-identified as White, 11 as Asian, 5 as Black, 1 as Hispanic, and 5 as Bi-racial. All were current students at Hamilton College.

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