Long-Married Couples Recall Their Wedding Day: The Influence of Collaboration and Gender on Autobiographical Memory Recall

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Abstract

The current study examined the influence of collaboration, expertise, and communication on autobiographical memory, by considering gender differences in recall and how they may influence the products and processes of remembering when male-female couples recall events together. Thirty-nine long-married, male-female couples recalled their memories of their wedding day. In Session 1, they recalled it individually for an experimenter. One week later, in Session 2, they recalled the same event jointly as a collaborative pair. Women reported more details, especially episodic details, than men across both sessions. Notably, collaborative recall included many new details that neither spouse had recalled individually. Exploratory analyses suggest that women were less influenced by collaboration than were men: women's communication behaviors influenced men's recall, but the reverse was not found for men's communication. Additionally, when couples' individual recall was more similar in content, men were more likely to decrease their contribution to the collaborative session. We consider these findings in light of transactive memory theory, in which joint meta-memory and the distribution of expertise influence the processes and products of recall in the interdependent system of a couple who extensively share their autobiographical memories.

Keywords: *autobiographical memory, memory collaboration, gender, transactive memory*

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We remember the events of our lives in conversation with others all the time. In fact, Pasupathi et al. (2009) reported that 90% of even mildly emotional events are shared with others within two days of their occurrence. To achieve a full understanding of autobiographical memory and its everyday properties, its collaborative nature must be more carefully understood and integrated into current models. In a 30-year research tradition, the collaborative recall paradigm has been used to examine the consequences of group remembering, typically focusing on groups of strangers recalling relatively simple laboratory stimuli (Weldon & Bellinger, 1997). Collaborative recall experiments have yielded robust "collaborative inhibition" effects in which people remember less in groups than they do alone (for reviews see Harris, Paterson, & Kemp, 2008; Marion & Thorley, 2016; Rajaram & Pereira-Pasarin, 2010). Research using the socially-shared retrieval-induced forgetting paradigm has demonstrated how collaboration influences patterns of remembering and forgetting to make group members' recall more similar to each other (e.g., Coman, Momennejad, Drach, & Geana, 2016; Cuc, Koppel, & Hirst, 2007; Hirst & Echterhoff, 2012). Recent research on socially distributed cognitive systems has emerged suggesting benefits of shared remembering in certain kinds of groups (e.g., Barnier et al., 2014; Harris, Barnier, & Sutton, 2013; Harris et al., 2014; Meade, Nokes, & Morrow, 2009).

Existing studies rely mostly on non-personal laboratory stimuli, and empirical studies of autobiographical memory's collaborative nature remain rare, at least outside of the developmental context (for one exception, see Stone, Barnier, Sutton, & Hirst, 2012). Autobiographical recall is complex and difficult to quantify (Barnier, Klein, & Harris, 2018). The way that events are remembered may vary across occasions and contexts for a range of

reasons, because the functions and meaning associated with recall are context-dependent (Harris, Barnier, Sutton, & Dixon, 2017). Thus, studying autobiographical memory presents a conceptual and methodological challenge compared to word lists: how should the influence of collaboration be measured and interpreted? In the current research, we examined the effects of collaboration on autobiographical memory by tracking the particular details that older couples recalled about a significant shared event: their wedding day. We compared details recalled separately by the two individuals, to those they recalled together as a collaborative pair. Adopting the conceptual framework of transactive memory systems (Wegner, 1986), we also examined dynamics of knowledge, expertise, and communication, and how these might explain any shifts from the individual to the collaborative recall context.

Theory and research from two domains suggest links between autobiographical memory recall, conversational processes, and dynamic patterns of expertise in intimate groups, motivating the focus of the current analysis. In parent-child reminiscing, parents' communication behavior can increase the amount and enhance the qualities of what children recall about the past (see Fivush, Haden, & Reese, 2006; Nelson & Fivush, 2004; Salmon & Reese, 2016). In this context, parents are skilled rememberers who scaffold their child's development and guide narrative structure, meaning-making, and associated skill development (e.g. Haden, Haine, & Fivush, 1997; Reese & Cleveland, 2006; Sales & Fivush, 2005). However, distributions of expertise can depend on context even in parent-child conversations, with evidence that parents provide less scaffolding in contexts in which their children are domain experts (Palmquist & Crowley, 2007).

In dyadic remembering between adults, transactive memory theory (Wegner, 1987; Wegner, Giuliano, & Hertel, 1985) provides a theoretical framework for understanding how patterns of expertise influence collaborative recall. Intimate couples, friends, and families learn

about each other's knowledge bases and skill sets over time, and come to rely on each other to share and coordinate remembering, enhancing the memory capacity of the group as a whole. Transactive memory is argued to rely on patterns of expertise and metamemory processes: group members need to develop a shared and accurate understanding of "who knows what" in the group, and to communicate effectively to coordinate their recall (Wegner, 1987; Wegner et al., 1985). Based on this theory, when it comes to autobiographical memory, an individual might put less effort into encoding some information, with the assumption that someone else in their social group (e.g., a sibling, a spouse) is more capable in that domain. Additionally, during retrieval, an individual might defer to another, or play a more dominant role, depending on the memory task and patterns of expertise within the group (Wegner, 1987; Wegner et al., 1985; see also Cuc, Ozuru, Manier, & Hirst, 2006). According to transactive memory theory, the memory of the group is not simply the sum of the different members within the group, because the group product is transformed by the processes of communication between individuals. Thus, the output of groups recalling together as a unit is likely to be different than simply combining the output of individual members, such that groups might show *emergence* in memory outcomes, and individuals may realise benefits from remembering within effective transactive memory systems (Barnier et al., 2018; Harris, Barnier, Sutton, & Keil, 2014).

Research on intimate couples has yielded important findings about the possible benefits of shared remembering for autobiographical memory, of the kind predicted by transactive memory theory. For example, Harris et al. (2017) conducted a recall task with older married couples, in which couples listed all the personal trips that they had taken together in the course of their relationship. Although this was not an autobiographical reminiscing task per se, it involved recalling personally-relevant information about shared experiences. When engaging in

collaborative recall, the couples in this study produced more episodic information – extraneous to the task itself – than when recalling separately, despite an overall decrease in the total number of trips recalled. Harris et al. (2017) argued that these findings suggest one way in which memory shifts qualitatively in conversation with another person, whereby the function and goals of remembering can change depending on recall partner (i.e., an experimenter vs. a spouse who shared the events). But it is unclear whether similar shifts would have been observed if recalling episodic details had been the stated goal of the experimental task. Moreover, the methodology of Harris et al. (2017) involved examining recall at the level of the dyad and pooling across the two individuals within the group, such that differences in contributions between the two individuals within couples were not examined. Previous research therefore suggests that couples recall different kinds of information when they collaborate compared to when alone, but little is known about how the individuals within the group -- and the distribution of expertise within it for a particular memory task – might influence the ways that autobiographical memories are jointly recalled.

One individual difference that may influence collaboration, patterns of expertise, and communication dynamics in male-female intimate relationships is gender. Gender roles may contribute to assumptions about expertise and distribution of responsibility that is critical in transactive memory systems (Wegner, 1987; Wegner et al., 1985). Expertise in this sense refers to one partner relying more heavily on another because of knowledge that that partner is more skilled or usually takes primary responsibility for a task, even if one is capable of performing it. Gender differences in autobiographical memory narration, socialized from childhood, have been well-documented (for a review, see Grysman & Hudson, 2013). Women include more emotion in their memory narratives (Bauer et al., 2003), but also more factual information (Grysman,

Fivush, Merrill, & Graci, 2016) and episodic detail (Fuentes & Desrocher, 2013; Grysman, 2017). Women may report more details during both the encoding and retrieval of events (Wang, 2013). A recent meta-analysis found a small but significant advantage for women in lab-based episodic memory tasks that are verbally based (Asperholm, Högman, Rafi, & Herlitz, 2019), suggesting that narrative tasks like autobiographical memory recall are likely to show this advantage. Some research suggests that women value reminiscing more than men (Pillemer, Wink, DiDonato, & Sanborn, 2003). Given the long-term experience that married couples have remembering together, they have the opportunity to learn the abilities and preferences of their partners and to develop norms of how to collaborate. Gender roles in some cultures may contribute to these norms. For example, in contexts where women tend to provide more details in their narratives than men, men may respond by simply deferring to women as perceived experts, or women might work to elicit information from men in order to keep them more actively engaged in conversation.

The Present Study

In the present study, long-married couples were recruited as part of the Australian Imaging, Biomarkers, and Lifestyle Study of Ageing (AIBL; Ellis et al., 2009). Couples were asked to describe memories of their wedding or proposal day and did so separately at Session 1 and collaboratively at Session 2, separated by a week. The "wedding day" event was chosen to keep the memory probe and general content similar across couples, because this was one event type that they all had in common. The resulting narrative data were coded for episodic and semantic details, using the coding system described by Levine, Svoboda, Hay, Winocur, and Moscovitch (2002). We compared the details recalled during individual vs. collaborative recall,

and particularly examined the influence of gender, expertise, and communication dynamics on details produced at individual and collaborative recall.

Hypotheses. The analyses reported here were exploratory, due to the novelty of the methodology, but they were conducted under the following general hypotheses:

The influence of social context. Because of the dynamic nature of collaborative recall, we expected that shifting from individual recall with an experimenter to collaborative recall with one's spouse would influence recall in ways that cannot be simply described as additive or subtractive. Extensive work on "collaborative inhibition" has found that collaborative groups recall less than the pooled recall of the same number of individuals recalling alone, for non-personal material (see Marion & Thorley, 2016, for review). However, for autobiographical reminiscing, we predicted that different details about the event – in terms of the nature of the information provided – would be recalled in individual compared to collaborative recall, reflecting the context-dependent nature of autobiographical memory (see also Harris et al., 2017). To examine these shifts in contents of recall, we tracked the specific details recalled across occasions.

Effect of social context differs by gender. Based on gender differences reported in past research on both episodic and autobiographical memory (Asperholm et al., 2019; Grysman & Hudson, 2013), women were expected to provide more episodic details than men, but we also expected the effects of collaboration to differ by gender. One possible approach to this prediction is to consider the role of expertise. Expertise is crucial in transactive memory, as the perceived expertise of one partner affects what is shared and how conversational roles are established. If women recall more than men in episodic and autobiographical tasks, transactive memory theory would predict that couples develop an awareness of this pattern within the dyad over time. In

addition, Grysman and Hudson (2013) suggested that men might be more influenced by context than women, based on empirical work by Fivush, Bohanek, and Zaman, (2011), Aukett, Ritchie, and Mill (1988), and Cvasa (2007). All of those studies examined how people reported autobiographical memories in the presence of different conversational partners, but all of them found greater variability between contexts for males than for females (see also Grysman & Denney, 2017). Thus, in the present study, we expected that women would recall more episodic detail in their autobiographical memories and that men would show more shift from the individual to collaborative context than women.

Methods

Participants

Participants were 78 individuals, age 68-90 years (M = 74.74, SD = 5.10). They were members of 39 long-married male-female couples, married to each other 13-65 years (M = 49.46, SD = 8.78). Participants were recruited as part of AIBL Study of Ageing (Ellis et al., 2009) in which over 1100 individuals have been extensively tracked over 5 years to examine predictors of healthy ageing (see Barnier, Harris, Morris, & Savage, 2018, for more details about screening procedure and the overall goals of the AIBL study). The eligibility criteria for inviting participants into our study was that (1) participants were couples in which both individuals were being tracked within the AIBL sample; and (2) both members of the couple had been identified in their regular screening by AIBL as having no cognitive impairments (i.e. both were classified as “healthy controls”). We identified a total of 47 couples in the AIBL sample who met the criteria for inclusion in the current study. They were solicited by phone and mail, resulting in participation of 39 couples for the current study.

Materials and Procedure

Experimenters visited participants in their homes on two occasions separated by one week. At Session 1, participants went into separate rooms with a gender-matched experimenter and completed a series of memory tests, neuropsychological tests, word list recall, and autobiographical event recall (see Barnier et al., 2018; Harris et al., 2018). The focus of the current analysis is on the autobiographical memory task. At the beginning of Session 1, prior to separating for their individual recall sessions, the experimenter asked couples:

> We normally ask couples to remember the day that they got engaged or the day of their wedding. Would you both be able to recall one of these events for us later? Which would you like to choose?

Of the 39 couples, 38 chose their wedding day and one couple described the day they got engaged. During Session 1, participants were asked to spend up to one minute thinking about the event, and then to describe in as much detail as possible "everything you can remember about the event, including what happened and where, as well as both of your reactions and emotions and anything else you can remember." They were given three minutes to provide a description of everything they could recall. If they completed before three minutes, they were prompted to provide more detail. Participants who were still recalling details at three minutes were allowed to finish.

During Session 2, couples jointly recalled the event for an experimenter, after receiving the following instructions:

> In today's session, we will be asking you to recall some of the events that you told us about last week. For each event I want you to spend up to a minute discussing the event to make sure that you both know which event it is. Then, I will give you three minutes. Work together to tell me, in as much detail as you can, everything

you can remember about the event, including what happened and where, as well as both of your reactions and emotions and anything else you can remember.

Again, participants were encouraged to keep recalling until 3 minutes had elapsed, but were allowed to complete their recall if they were still recalling details at 3 minutes. All narratives were provided verbally, and audio recordings were transcribed by laboratory assistants to produce transcripts for analysis. Participants completed the same procedure for another event (a shared distant past event) but that event is not analyzed in this report.

Narrative Coding

Internal and external details. Levine et al. (2002) established a coding system for scoring "internal" and "external" details in autobiographical recall, designed to distinguish episodic from semantic details. Internal details cover five aspects of specific episodic recall: event, time, place, perceptual, and emotion/thought details. External details include both semantic information and episodic details from other events outside the central event, often told as background. We separated these two subcategories for our analyses. Therefore, our analyses included *internal event details, external event details*, and *semantic details*.

Two research assistants were trained using the guidelines of Levine et al. (2002). Using Levine's practice manual with 20 narratives, the two coders achieved correlations of rs > .85 for internal details and rs > .93 for external details. These two research assistants then both coded narrative data for 12 of the 39 couples, representing 30.7% of the data. Agreement was excellent for internal (ICC = .97) and external (ICC = .84) details, and one assistant coded the remaining narratives.

New vs. old details. In addition to these three major categories of detail types, each detail recalled in the collaborative session was further subcoded to track shifts in content across

sessions. All details in the collaborative session were coded into one of three categories: details that were repeated by the same narrator as in individual recall were coded as *old*; details that were mentioned by one partner during individual recall and then repeated by the other partner during collaborative recall were coded as *new*; new details in collaboration that had not appeared in either individual's narrative were coded as *new for both*. Reliability for this coding was also excellent, *ICC* = .91.

Communication behaviors. Using the work of Harris, Keil, Sutton, Barnier, and McIlwain (2011) and a careful reading of the memory narratives as guides, categories in the collaborative session were created to code for communication behaviors: statements made by either spouse that could influence the partner. The categories are outlined in Table 1. Because of low means in many of these categories, they were summed together for the purposes of inter-rater reliability, which was acceptable (*ICC* = .71), as well as for analysis.

Creation of nominal scores. After coding was completed, one research assistant assessed which coded details appeared in both of the individual narratives for each couple, i.e., identifying details that were redundant between the two individual narratives. "Nominal scores" were calculated to pool individual recall as is standard in the collaborative recall paradigm (Basden, Basden, & Henry, 2000; Weldon & Bellinger, 1997). These scores were calculated as the total number of details recalled by the two members of each couple while only counting redundant overlapping details once.

Results

Individual Baseline and Nominal Group Recall

First, we examined individual baseline recall, looking for gender differences in details recalled, and then examining overlap in the details recalled by the two spouses separately. We

hypothesized that women would produce more details than men, and that differences would be more prominent and more consistent for internal details than for external and semantic details, based on prior research. To account for the interdependency of scores of members of the same couple, we scored the number of details recalled by men and women within couples, and conducted all analyses at the couple level with husbands' and wives' scores treated as a within-couple repeated measure (see Table 2). A within-subjects multivariate analysis of variance (MANOVA) was conducted at the couple level, with three dependent variables for the type of detail: internal, external, and semantic. Results yielded a significant multivariate main effect of gender, *Wilk's* λ (3, 35) = .623, p = .001, η_p^2 = .38, indicating more details overall for women than men. Follow-up univariate analyses are presented in Table 2, showing the variety of effect sizes for different detail types. Consistently, during individual recall, women recalled more than men across internal, external, and semantic details (see Table 2), with the largest effect size for internal details, consistent with prior research. This finding reflects previous work, and suggests that – at least for this event in this context – patterns of expertise within couples were such that women were more expert at this memory task.

We also compared the details recalled by the two spouses with the goal of pooling recall output to form nominal group scores. Interestingly we noted very little overlap in spouses' memory narratives, even though they were ostensibly recalling the same specific event. Nominal scores calculated by pooling were almost as high as scores calculated by simply adding the two individual scores together: pooled scores were 89% of summed scores for internal details, 97% for external details, and 93% for semantic details. As demonstrated in Figure 1, the average recall for nominal pairs was close to simply doubling the individual average. This reflects that very few details were redundant across the two individual recalls. That is, even though women

and men were recalling the same event, their individual narratives consisted of almost entirely different details. This lack of overlap meant that nominal scores were inflated compared to word list paradigms where overlap is much higher, and that in the current analysis, nominal group performance presented a very high benchmark against which to compare collaborative recall.

One possibility we considered in interpreting this lack of overlap is the way that "wedding day" events unfold, whereby the two spouses typically begin the day separately and meet at the ceremony. Perhaps in the individual condition, participants tended to narrate the part of the wedding day that they were separated (i.e., time spent preparing for the wedding), and the "wedding day" may be a relatively unique event in this way. To address this possibility, all internal (event-specific) details recalled in the individual session were coded as "both present", "spouse absent", and "hearsay". "Hearsay" indicated details for which the person reporting it was not actually present, but had heard that it happened, such as reporting what happened to their spouse during preparations. Most internal details were coded as "both present", (Men: M = .92, SD = .20; Women: M = .84, SD = .15). Thus, although the inclusion of details for which the other spouse was not present may have contributed to low overlap, it was not its primary source.

Overall, our analysis of initial individual recall suggested: (1) that women recalled more than men for all kinds of details but particularly for internal details; and (2) that there was surprisingly little overlap in the details recalled by the two spouses.

Comparing Collaborative to Individual Recall

Next, we examined the extent to which the number of details recalled shifted across recall contexts, from individual to collaborative recall (see Figure 1). We compared individual, collaborative, and "nominal pair" scores across the various categories of details, where nominal scores represent the pooling of the two individual recalls with the redundant details only counted

once (Weldon & Bellinger, 1997). Overall, although each individual's recall contained fewer details than average collaborative recall, the average collaborative recall contained fewer details than the average nominal group score (see Figure 1). That is, couples together recalled more details than single individuals, but fewer than the two individuals combined, consistent with the "collaborative inhibition" phenomenon that has been extensively demonstrated with simple stimuli (Marion & Thorley, 2016).

During collaborative recall, a substantial number of details recalled were "new for both": 64% of internal details, 74% of external details, and 46% of semantic details (see Figure 1). These findings indicate that there was surprisingly low overlap, not only between the details recalled by the two partners individually, but also with the details they recalled together when they collaborated. That is, collaborative recall yielded a mostly-new third version of the event. These findings suggest that for this autobiographical memory task, a simple account of the data in terms of "collaborative inhibition" may not be appropriate, since the nominal group scores were inflated by the lack of overlap between the two individuals, and collaboration yielded different details, not just fewer. Our results instead suggest a shift in the nature of the details recalled across occasions (see also Harris et al., 2017). We return to this point, and possible reasons for this shift in details, in the Discussion.

To examine gender differences during collaborative recall, a MANOVA was conducted, with gender as the within-subjects independent variable and nine dependent variables, consisting of the three detail types –internal, external, and semantic – and the three subcodes of source for each detail type – old, new, and new for both. As for individual recall, the main effect of gender was statistically significant, *Wilk's* λ (9, 30) = .479, p = .004. η_p^2 = .52, indicating more overall details for women than for men. Table 2 shows follow-up univariate analyses for the categories

of detail tested. Just as for individual recall, women recalled more than men across detail types during collaboration, with the largest effect sizes for internal details and old details.

Impact of Conversational Dynamics and Communication Processes on Collaborative Recall

Our analyses indicated that fewer and different details were recalled during collaborative recall compared to pooled individual recall, and that women consistently recalled more than men during both individual and collaborative recall. However, because of the low overlap and the preponderance of details that were new for both individuals, viewing these differences in terms of "collaborative inhibition" would miss the overall picture. To explore the role of conversational dynamics and how they interacted with details recalled, we next examined communication behaviors and relative contributions during collaborative recall.

In this section, we focused our analyses and discussion only on the internal (i.e., episodic) details for four reasons: three a priori, and one after seeing the data. First, as described, a straightforward attribution can be made between the number of internal details included and the amount of recall. More internal details mean more information about the specific event being narrated. External and semantic details are often used as background or supporting information (Levine et al., 2002), which may make them more susceptible to context (e.g., needed with the experimenter but not the spouse), and they may be less clearly informative of how much detail is recalled because they may reflect narration style. Second, researchers have reported gender differences in internal details and other narrative coding of episodic details (Wang, 2013), but not in external details (Fuentes & Desrocher, 2013; Grysman, 2017). This is consistent with episodic, but not semantic, memory research consistently showing gender differences (see Asperholm et al., 2019; Herlitz & Rehnman, 2008). Third, when recalling individually for an experimenter, older adults have shown an episodic deficit, such that they recall fewer internal

details compared to younger adults, and this deficit is argued to reflect changes in memory function with age (Addis, Wong, & Schacter, 2008; Levine et al., 2002). Therefore, we were interested in the possibility that collaboration might support recall for these details that older adults typically have difficulty recalling (see also Barnier et al., 2014; Harris et al., 2017). Finally, in the current data, means for internal details were approximately five times higher than for external event details, allowing for more powerful analyses.

We used the internal details to create a series of variables that tracked different aspects of couples' recall performance and relative contribution, as outlined below. We then examined the relationship between contribution, content overlap, conversational dynamics, and recall performance.

Quantifying conversational dynamics. To characterize the amount recalled during collaboration and relative contribution of individuals within couples, we calculated the following metrics from their individual and collaborative recall (see Table 3):

(1) $Overlap = 1 - \frac{nominal}{sum}$. This metric calculates the proportion of redundant details during initial individual recall, where a higher value indicates greater overlap in the specific details recalled by the two partners, or more similarity in baseline content. As can be seen in Table 3, the mean overlap for internal details was .11. On average, only 11% of details in couples' individual narratives at Time 1 were overlapping, consistent with our findings above.

(2) $Prop_M = \frac{husband's\ internal\ details\ Session\ 2}{husband's\ internal\ details\ Session\ 1}$ and $Prop_F = \frac{wife's\ internal\ details\ Session\ 2}{wife's\ internal\ details\ Session\ 1}$. By calculating a ratio of details produced by each spouse during the collaborative session to details recalled during the individual session, we measured the extent to which each partner 'met their potential' during collaboration. Most people produced less in collaborative recall (see Table 3), as scores lower than 1 indicate fewer details recalled during collaboration, or "collaborative

inhibition" for the individual. Scores greater than 1, though rare, indicated that some individuals recalled more details during collaboration than they did during their individual recall session, or "collaborative facilitation".

(3) RatioMF_{ind} = $\frac{husband's\ internal\ details\ Session\ 1}{wife's\ internal\ details\ Session\ 1}$, and Ratio$MF_{collab}$ = $\frac{husband's\ internal\ details\ Session\ 2}{wife's\ internal\ details\ Session\ 2}$ measured the contributions made by the husband relative to the wife at each session, i.e., a ratio of male:female details recalled. A value close to 1 indicated that both male and female recalled equivalent numbers of internal details. Scores above 1 indicated more contribution from men than women and scores below 1 indicated more contribution from women than men. For example, the mean of RatioMF_{collab}, 0.77, indicates that men provided 0.77 internal details for every 1 internal detail that women provided at the collaborative session. Notably, the range at individual recall (.30 – 1.89) was substantially smaller than at collaborative recall (.06 – 2.50). The meaning of this range should be emphasized: a score of 1.0 would indicate equal contributions between partners. Therefore, the minimum of .06 indicates a case where the wife reported 16x the number of details of the husband (he contributed 0.06 details for every 1 of hers), whereas the maximum of 2.50 indicates a case where the husband reported 2.5x as many details as the wife.

(4) *ChangeRatio* = $\frac{RatioMF_{collab}}{RatioMF_{ind}}$. This metric calculates the shift in the ratio of male to female internal details from individual to collaborative recall. Scores near 1 imply that the ratio of male to female was similar when reporting individually to when reporting in the collaborative session. Scores above 1 indicate that the contribution of men increased from individual to collaborative recall; scores below 1 indicate that the contribution of women increased from individual to collaborative recall. Thus, ChangeRatio provides an opportunity to identify couples where one

person changed the extent of their contribution when collaborating with the other, enabling an analysis of predictors of this pattern. Despite a mean close to 1, implying average consistency in contributions across sessions, the wide range (.09 – 3.47) on this variable suggests major individual- and couple-level differences in recall patterns such that some partners dramatically changed their recall in the presence of their spouses, in both directions. The minimum of .09 indicates a case in which the wife recalled 11 times more of the joint details during collaboration than during individual recall. The maximum of 3.47 indicates a case in which the husband recalled 3.47 times more of the joint details when together than when apart.

(5) $Comm_M$ and $Comm_F$. This metric calculated, for men and women separately, the total instances of communication behaviors, including acknowledge, defer, correct, cue, and finish sentences (as in Table 1). These were conceptualized as variables indicating higher levels of one spouse responding to the other one's statements. These variables were combined, using guidance from Harris et al. (2011) in order to limit multiple comparisons with low-frequency variables.

Associations with recall performance. As can be seen in Appendix A, there were individual differences in patterns such that some couples remained largely consistent in who remembered what and how much from one session to the next, whereas some drastically changed the division of recall. Some showed more equal expertise across partners and others had a clearly dominant partner. We examined how our calculated metrics of conversational dynamics, contribution, and communication were associated with indices of collaborative recall performance, using a series of regressions summarised in Table 5.

To index the detail provided by each spouse at collaborative recall, we used the following three categories of (five total) dependent variables: (1) number of details recalled by each spouse during collaboration ($Collab_M$ and $Collab_F$, from Table 2); (2) details recalled during

collaboration as a proportion of their individual recall for each spouse ($Prop_M$ and $Prop_F$, from Table 3); and (3) ChangeRatio (from Table 3), a couple-level variable that assessed whether the relative contributions within each couple differed during collaborative recall compared to individual recall. As a reminder, higher scores represent men's proportion of recall increasing during collaboration, lower scores representing women's proportion of recall increasing during collaboration, and scores near 1 representing no change in relative memory production. Thus, these outcome variables captured how much each spouse recalled during collaboration and the extent to which their contribution was influenced by the collaborative context. Predictor values were chosen in an attempt to identify aspects of the individual's or the couple's recall that would explain shifts from one context to another. Our predictor variables for each outcome variable (see Table 4) included the other outcome variables (when they were not collinear), the number of details in individual recall to account for baseline productivity (from Table 2), and baseline expertise distribution score of $RatioMF_{ind}$, Overlap scores, and communication variables of $Comm_M$ and $Comm_F$ (from Table 3), to assess if dynamics of expertise and contribution influenced the outcome variables. Zero-order correlations between all variables are presented in Table 4.

Using all the variables in Table 4 and adding in the control variables of participant age and length of relationship, stepwise regression analyses to determine what predicted each of the five dependent variables. Because some of these five variables were dependent on each other (i.e., were created by dividing one by the other), X's are shown in Table 5 when they were not included as predictors in these models. ChangeRatio was not entered as a predictor in any analysis because of its dependence on the other four outcome variables.

What predicted how many details each partner recalled during collaboration? As can be seen in the first two columns of Table 5, for men, the number of details recalled during collaboration (i.e., $Collab_M$) was predicted by more details recalled in the individual session (i.e. $Indiv_M$), a reduction in women's contributions to the collaborative session (i.e., negative relationship with $Prop_F$), and women's communication behaviors ($Comm_F$). For women, the number of details recalled during collaboration (i.e., $Collab_F$) was similarly predicted by more details recalled in the individual session (i.e. $Indiv_F$) and a reduction in men's contribution to the collaborative session (i.e. negative relationships with $Prop_F$), but not with men's communication behaviors (i.e. $Comm_M$).

What predicted the extent to which each partner matched their individual potential during collaboration? In the third and fourth columns of Table 5, predictors for the proportion of details recalled during collaboration compared to those recalled individually are shown. Men underperformed relative to their individual recall when women recalled more details during collaborative recall (i.e., a negative relationship with $Collab_F$). However, men's recall was additionally predicted negatively by $RatioMF_{ind}$, suggesting that men who produced relatively less in the individual session (leading to lower $RatioMF_{ind}$ scores) were likely to maintain their lower contribution in collaboration. On the other hand, men's collaborative contribution was higher when men themselves showed more communication behaviors (i.e. $Comm_M$). For women, more detail relative to individual recall was predicted by fewer details in individual recall – suggesting they had set a lower benchmark for themselves (i.e., negative relationship with $Indiv_F$). It was further predicted by a reduction in contribution from their spouses in the collaborative session (i.e. negative relationship with $Prop_M$).

Finally, what predicted a shift in the balance of male to female contributions from individual to collaborative recall? The regression for ChangeRatio (fifth column of Table 5) indicated two significant predictors: when women showed more communication behaviors and when there was less overlap in individual narratives. Because ChangeRatio was created from four sources (individual and collaborative recall for each spouse), we obtained correlations between each of these four source scores and the two significant predictors to clarify this relationship. Women's communication behaviors were significantly correlated only with men's collaborative recall, $r(37) = .38$, $p = .017$ (all other ps > .22), suggesting that women's behaviors may have boosted men's performance. Overlap was significantly correlated only with women's collaborative recall, $r(37) = .33$, $p = .039$ (all other p's > .44), suggesting that, when individual narratives were more similar, women recalled more than men at the collaborative session, leading to a relative reduction in equality from the individual to collaborative context.

Examples of dynamics from the transcripts. Examining the individual transcripts yields insights into the surprising shift in details recalled across sessions. There are different reasons why collaborative recall might represent a reduction in details compared to the pooled nominal recall of the two individuals. The impact of conversational dynamics and particularly the interaction between the ratio scores ($RatioMF_{ind}$ and $RatioMF_{collab}$) and overlap in details can be seen when examining the scores of individual couples (see Appendix A). In addition, we have provided transcripts from two couples in Appendix B. These narrative examples demonstrate ways in which dynamic components of contribution and expertise were interacting to drive the shift in details from individual to collaborative recall. In the first case, the relative equality between partners and overlap in details during individual recall draw attention to the dramatic shift at collaborative recall, where the roles change and the woman, as expert, dominates, despite

similar individual production. In the second example, the lack of overlap at individual recall serves to undermine the collaborative details produced about one aspect of the event because knowledge in that domain is not evenly distributed throughout the transactive system.

Discussion

We compared individual to collaborative recall of a shared autobiographical event within older couples. Our goal was to compare details recalled across contexts and to consider the role of expertise and communication. When recalling together, couples recalled fewer details than when pooling their 'nominal pair' performance, consistent with the collaborative inhibition that is typical when pairs remember laboratory stimuli together (see Marion & Thorley, 2016). However, in this case, we found that the details recalled shifted in ways inconsistent with a straightforward application of retrieval disruption or inhibition in recall. When long-married male-female couples recalled their wedding day, the details reported shifted from individual to collaborative recall: 64% of details recalled in the collaborative session were coded as new details that had not been reported by either spouse at the individual session. We essentially found that couples produced three different narratives in the three different recall sessions, further supporting the value of exploring collaborative autobiographical memory recall in the laboratory. Because of the substantial shift in the particular details recalled in addition to how much was recalled, our work here cautions against a straightforward application of existing collaborative recall paradigms to autobiographical memory data.

There are a number of possible cognitive mechanisms underlying the shift in details recalled across recall tests. In the collaborative recall paradigm, collaborative inhibition arises from a combination of two factors (Rajaram & Pereira-Pasarin, 2010). The first factor is retrieval disruption, whereby individuals forget items that they would have remembered individually

(Basden, Basden, Bryner, & Thomas, 1997; Marion & Thorley, 2016). Retrieval disruption occurs because there is a mismatch between an individual's retrieval organisation for the material and that of other group members that they remember with during collaboration. The second factor is a failure of cross-cueing, whereby group members fail to cue each other to produce new information during collaboration (Finlay, Hitch, & Meudell, 1995; Rajaram & Pereira-Pasarin, 2010). We saw evidence of both forgetting and new memory in couples' recall, suggesting that both retrieval disruption and cross-cueing were operating. In terms of forgetting, our findings are consistent with couples experiencing retrieval disruption, because individuals failed to recall most of the details they had provided during Session 1. However, effect size of this disruption was very large in the current study, substantially larger than the typical 10% forgetting rates when strangers collaborate to recall word lists. Overall, if this forgetting was due to retrieval disruption, this suggests that the effects of retrieval disruption may be substantial for autobiographical material, where there are infinite numbers of potential details recalled and hence more possible diversity in retrieval strategies, compared to a constrained word list task. On the other hand, the abundance of new details that were cued in collaboration suggests that couples -- in contrast to strangers recalling word lists -- were able to successfully cross-cue each other, so much so, that they produced new and different information when together. This finding is consistent with the findings that couples use effective cueing strategies that can coordinate and enhance collaborative recall on both non-personal and personal list recall tasks (Harris et al., 2018). It is also consistent with notions of *emergence* in group remembering, in which the products of a group are qualitatively different from those of the individuals who make up the group (Harris et al., 2014). Our findings reflected a qualitative rather than quantitative shift in details recalled.

Another compatible possibility is that the kind of details that were relevant and prioritized when recalling with the experimenter were different from the kinds of details relevant and prioritized when recalling with one's spouse. This functional account is not inconsistent with the cognitive account above, because the demands of the social context may drive the mismatch in retrieval organizations between the individual and collaborative sessions. The social context may also facilitate particular kinds of new information during collaborative recall, which may be the reason why couples showed cross-cueing of new information when laboratory groups do not (e.g. Finlay, Hitch, & Meudell, 1995; Rajaram & Pereira-Pasarin, 2010). Harris et al. (2017) similarly reported a shift in details from the individual to the collaborative context, consistent with a shift in the function of recall. Collaborative recall is associated with social functions, such as maintaining intimacy in relationships, and entertaining others (Harris, Rasmussen, & Berntsen, 2014), while recalling for the experimenter may be more driven by social norms, striving for accuracy, or scripts of how events like weddings normally unfold (see also Hyman, 1994). Therefore, this functional context may influence the kinds of retrieval strategies that individuals adopt in individual vs. collaborative recall.

Overall, our findings of low overlap between individual and collaborative sessions emphasise the methodological challenges in applying a laboratory word-list paradigm to a more open-ended, complex, unconstrained, and temporally-extended content such as autobiographical memory. Collaborative inhibition has previously been found for brief stories (e.g. Weldon & Bellinger, 1997), and a meta-analysis has suggested a smaller collaborative inhibition effect for stories compared to uncategorized word lists (Marion & Thorley, 2016), contrary to the potentially large retrieval disruption we identified in the current study. It is not yet known how the paradigm might extend to more complex and lengthy but non-autobiographical stimuli, such

as the plot of a novel[1], for instance. However, we speculate that similar findings are likely to apply, and that as described above, processes of retrieval disruption, cross-cuing, and functional shifts are likely to drive low levels of overlap across recall occasions and contexts.

Gender and Collaborative Recall

In this study, we focused on gender to gain insight into the transactive systems that develop in male-female couples, and how patterns of expertise might help to explain the differences between individual and collaborative recall. Narrative memory studies often find that women provide more episodic details than men in their memory narratives (Fuentes & Desrocher, 2013; Grysman & Hudson, 2013), and this trend was replicated here in the individual session (time 1) in which women, on average, recalled approximately 20% more than men. If these numbers are representative of trends in these couples' lives outside the laboratory and outside this event, we expect that both spouses would become aware of who tends to remember more and who shares more in conversations. Women have been identified as the 'kin-keepers' of families (Hagestad, 1986) and current research finds that people still hold gender stereotypes of women as more emotional and more socially and relationally oriented (Löckenhoff et al., 2014). Given the role of autobiographical memory in maintaining relationships (Bluck, Alea, Habermas, & Rubin, 2005) it is not surprising that over time, a transactive system would develop in male-female couples in which both spouses recognize that the wife recalls in more detail when reminiscing about shared autobiographical events.

Indicators in Table 5 suggest that men's recall was more influenced by women than women were by men. For both partners, the number of details they recalled during collaboration was predicted positively by the number of details they recalled in the individual session, as well as negatively by their partner's recall during collaboration. These findings suggest that when one

individual brings more information to collaborative recall, the partner perhaps recognizes their expertise and is inhibited, recalling relatively less. Women in this task on average produced more details across both sessions. Additionally, only men's collaborative recall ($Collab_M$) was predicted by their partners' communication behaviors; women's collaborative recall ($Collab_F$) was not. Although correlational, we suggest that women's communication behaviors during collaboration may support increased recall in men, whereas the reverse was not the case (see also Harris et al., 2011; Harris, Barnier, Sutton, & Savage, 2018). These findings add to previous research showing that communication behaviors are critical to collaborative success (Browning, Harris, & Van Bergen, 2019; Harris et al., 2011; 2019; Meade et al., 2009), but previous studies have not examined 'who said what' within the collaboration.

Similar findings emerge when examining collaborative recall as a proportion of individual recall ($Prop_M$ and $Prop_F$), a metric that indicates the extent to which individuals matched their individual recall in the collaborative session. Women showed greater reductions in details recalled during collaboration when their own individual recall ($Indiv_F$) was higher and when men lost relatively fewer of their own details ($Prop_M$). For women, this suggests that they recalled relatively less in collaboration when they had set a high benchmark with many details recalled at the individual baseline, and that they recalled more as men recalled less. Men showed greater reductions in details recalled during collaboration when women's collaborative recall ($Collab_F$) was higher and when their individual recall scores were higher relative to women ($RatioMF_{ind}$), such that there was less of a discrepancy within the couple. Note the distinction between what predicted the reductions in details for women vs. men. Women showed greater reductions when they produced more individually independent of men's individual recall (i.e., they set a high bar, by which collaborative recall was divided in creating the proportion score);

men showed reductions in recall during collaboration only when their individual recall was higher relative to women. We suggest that men may have been sensitive to the expertise inherent in the task, adjusting their contributions according to the relative distribution of knowledge within the couple (c.f., Wegner et al., 1985).

Our analysis of shifts in male-to-female ratio in recall from individual to collaborative recall (ChangeRatio) further supports the interpretation of men being more influenced by collaboration than women. We found two predictors of this shift: women's communication behaviors, and overlap in the content of details recalled individually. When women engaged in more communication behaviors, men's share of collaborative recall increased relative to their share of individual recall (i.e., a higher ChangeRatio score). But when couples' individual recall overlapped more, men's share decreased (i.e., a lower ChangeRatio score), suggesting that men contributed more to collaborative recall when they had unique information to add, but when the details they recalled were common to both members of the couple (i.e., higher overlap), women more commonly were responsible for recalling these details during collaboration. Although the ChangeRatio variable is composed of multiple variables, follow-up correlations support this interpretation by showing that overlap correlated specifically with $Collab_F$ and that women's communication behaviors correlated specifically with $Collab_M$.

In sum, we argue that, combined, these analyses converge on the interpretation that women were less influenced by the collaborative context than men, and that women played more of a leadership role in collaborative recall. During collaboration, men deferred to women, and it was women's (and not men's) use of communication behaviors that supported men's (and not women's) contributions to the collaboration. One might argue that women's collaborative recall scores (both $Collab_F$ and $Prop_F$) were predicted by men's proportional collaborative recall, and

therefore that women were influenced by men at collaborative recall as well because the direction of causality is unclear. In contrast, the statistically significant effects of $RatioMF_{ind}$ and women's communication behaviors in the remaining three dependent variables ($Collab_M$, $Prop_M$, and ChangeRatio) require women's contributions to explain men's recall during collaboration. Thus, we interpret the overall pattern of findings in Table 5 as reflecting an interdependence between spouses, but one in which women's influence on men is clearly supported, with inconsistent evidence for men's influence on women. In further support of this approach, analyses predicted more of the variance in men's collaborative recall (R^2 of .52 and .39) than women's (R^2 of .35 and .28).

We have used the language of expertise to describe our findings, consistent with transactive memory terminology (Wegner et al., 1985), but we also consider the language of Cuc, Ozuru, Manier, and Hirst (2006), who noted the role of a *dominant narrator* who influences group recall more than other members of the group. Cuc et al. (2006) defined dominant narrators simply as those in a group who contributed disproportionately more during recall, and found that when families recalled events together, the presence of a dominant narrator led to increased overlap between group members' recall and the dominant narrator's. Our findings are consistent with this, suggesting that women tended to be dominant narrators in our study, and that the roles adopted within couples resulted in shifts in details recalled from the individual to collaborative context.

Limitations and Future Directions

We remain cautious about the extent to which these findings apply beyond this specific recall prompt, which targeted couples' "wedding day". First, it is possible that the wedding day in particular, due to cultural gender stereotypes, might have been thought of by the couples as the

domain of women, and thus, narrating one's wedding day might exaggerate gender differences compared to other events due to its emotional and relational content. We are not claiming that women are experts in all autobiographical events or in all couples, and it is possible that men will serve as experts or dominant narrators for other events or in specific couples. However, in the current sample, women recalled more than men about this event in both individual and collaborative recall, and collaborative processes reflected an awareness in the couple of the disparity. The wedding day is also a highly scripted event in which the couple is sometimes together and sometimes separated, and may not generalize to other events, although our analyses suggested that individuals were not focused on separate details. Further research is required to test how these patterns might extend out to events with other kinds of content, and particularly across different types of events in which patterns of expertise differ. For instance, in future research, we could ask couples to nominate events in which each member was the expert, or to rate relative expertise across a range of domains. The memories in the current study were also of long-ago events, and future work should examine how collaboration influences recall at more recent time points after the event has been experienced (see Fivush, Booker, & Graci, 2017) to more closely examine the impact of collaboration on memory over time.

We also caution against oversimplifying claims about gender, and note the range of influences and norms that can drive perceptions of expertise. Transactive memory systems are idiosyncratic, developing organically over years or decades of experience (Wegner, 1987), and gender norms are only one possible factor in determining patterns of expertise, responsibility, and relative contribution. Individual differences and differences between couples in this study were extensive. Not all wives recalled more than their husbands; some couples dramatically changed their proportion of recall in the collaborative session whereas others did not. Our

analyses capture broad trends and do not attempt to summarize the transactive memory system that develops in any specific couple. Instead, we consider these data to be a demonstration of the types of analyses possible through expanding the collaborative paradigm to intimate groups with longstanding shared histories to draw upon. Patterns of expertise depend on the strengths, skills, and experiences of the two individuals within each couple, the relationship dynamics, and the kind of memory task they are asked to complete. Future research may more carefully examine other individual and relationship differences that influence couple-level recall, as well as how interdependence and perceptions of expertise develop in different kinds of relationships over time.

Conclusions and Future Directions

Findings in this study represent exploratory work with an exceedingly rich narrative data set that was extensively coded, allowing us to track specific details across recall contexts, and to extend the collaborative recall paradigm to complex autobiographical material. We consider these data ideal for establishing certain fundamental findings (the role of gender, the large difference in details recalled between individual and collaborative recall), and the couple-level analyses valuable for demonstrating the types of data that can be gleaned from this paradigm regarding the role of conversation in studying autobiographical memory. In contrast to a word-list paradigm, which clearly defines the domain of what can be recalled, the details that can be included in an autobiographical memory report are open-ended, and recall is rich, complex, and imbued with meaning, such that no single recall task will be exhaustive. The data reported here offer a unique window into the collaborative nature of autobiographical memory recall. Our findings suggest a transactive memory unit between spouses in which distributions of expertise contribute to how collaboration proceeds and how it compares to individual recall.

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Footnote

[1]We thank our anonymous reviewer for this suggestion

Table 1

Means (SD) of Men's and Women's Communication Behaviors during Collaborative Recall

Coding Category	Men	Women
Finishing sentences	0.44(.79)	0.59(.82)
Married banter	1.95(2.05)	2.72(2.09)
Defer	0.31(.52)	0.36(.54)
Successful Cues	2.90(2.94)	3.49(3.49)
Failed Cues	0.28(.86)	0.46(.91)
Acknowledgement	7.77(4.57)	6.15(4.19)
Correction	0.82(1.12)	1.18(1.54)
Repeating self	1.26(1.57)	2.36(2.22)
Repeating partner	0.72(1.45)	0.49(.89)
Off-topic statements, talk about task, meta-memory	3.90(4.06)	5.36(4.54)

Table 2

Memory Details Reported, including Means (SD), Separated by Gender

Detail Type	Women	Men	*F*(38)	*p*	η_p^2
Individual Recall					
Internal	50.97 (19.50)	38.67 (16.96)	12.21	.001	.25
External Event	11.03(7.59)	7.36(5.35)	6.01	.019	.14
Semantic	10.63(6.07)	7.87(4.72)	7.51	.009	.17
Collaborative Recall					
Total Internal	36.64(16.41)	22.13(14.03)			
Old	12.56(8.01)	6.46(5.60)	16.03	<.001	.30
New	1.38(1.62)	0.77(1.04)	3.53	.068	.09
New for both	22.69(12.51)	14.90(11.10)	9.33	.004	.20
Total External Event	4.92(4.03)	3.15(3.63)			
Old	1.44(1.85)	0.46(0.94)	8.13	.007	.18
New	0.15(0.54)	0.03(0.16)	1.97	.168	.05
New for both	3.33(3.34)	2.67(3.43)	1.14	.292	.03
Total Semantic	12.10(8.87)	7.41(7.96)			
Old	6.54 (4.68)	3.79 (3.87)	7.72	.008	.17
New	0.10(0.38)	0.18(0.56)	.47	.500	.01
New for both	5.46(4.66)	3.44(4.52)	5.99	.019	.14

* $p < .05$; ** $p < .01$

Table 3

Means (SD) and Ranges for Conversational Dynamics Variables

Variable	M (SD)	Range
Overlap	.11 (.06)	.01-.28
$Indiv_M$	38.67 (16.96)	11-80
$Indiv_F$	50.97 (19.50)	20-97
$Collab_M$	22.13(14.03)	3-55
$Collab_F$	36.64(16.41)	10-74
$Prop_M$	.61 (.37)	.13-1.71
$Prop_F$	.75 (.30)	.28-1.56
$RatioMF_{ind}$	.82 (.38)	.30--1.89
$RatioMF_{collab}$	.77 (.59)	.06--2.50
ChangeRatio	1.04 (.83)	.09--3.47
$Comm_M$	14.18 (7.26)	2-31
$Comm_F$	14.49 (7.82)	2-35

Table 4

Zero-order Pearson's Correlations of Variables Used in Stepwise Regression Analyses

	$Collab_M$	$Collab_F$	$Prop_M$	$Prop_F$	ChangeRatio
$Collab_M$	--	-.06	-.57**	.27	.43**
$Collab_F$		--	.44**	-.65**	-.61**
$Prop_M$			--	-.39*	-.83**
$Prop_F$				--	.69**
$Indiv_M$	.57**	.34*	.24	-.11	-.23
$Indiv_F$	.19	.47**	.17	.29	.02
$RatioMF_{ind}$	.27	-.14	.18	-.28	-.27
Overlap	.14	-.36*	-.35*	.25	.38*
$Comm_M$	.44**	-.03	-.33*	.03	.24
$Comm_F$	.38*	-.12	-.30	.19	.37*

*p < .05, **p < .01

Table 5

Results of Stepwise Regression Analyses for Five Dependent Variables. Unstandardized Beta Values (95% CI) are Presented when Significant

Predictors	**DV: Collab$_M$**	**DV: Collab$_F$**	**DV: Prop$_M$**	**DV: Prop$_F$**	**DV: ChangeRatio**
R^2	.52	.35	.39	.28	.24
Individual Session Variables					
Indiv$_M$	.48 (.28, .68)				X
Indiv$_F$		.34 (.11, .57)		-.006 (-.01, -.001)	X
RatioMF$_{ind}$			-.30 (-.03, -.56)		
Overlap					-.33 (.03, .43)
Collaborative Session Variables					
Collab$_M$	X		X		X
Collab$_F$		X	-.01 (-.02, -.004)	X	X
Prop$_M$	X	-16.56 (-4.14, -28.98)	X	-.37 (-.62, -.13)	X
Prop$_F$	-12.57 (-23.87, -1.27)	X		X	X
Comm$_M$			.02 (.005, .033)		
Comm$_F$	.54 (.10, .97)				.03 (.002, .07)

Note. X's are used when the predictor was excluded from a specific analysis because of collinearity. Blank cells indicate nonsignificant predictor

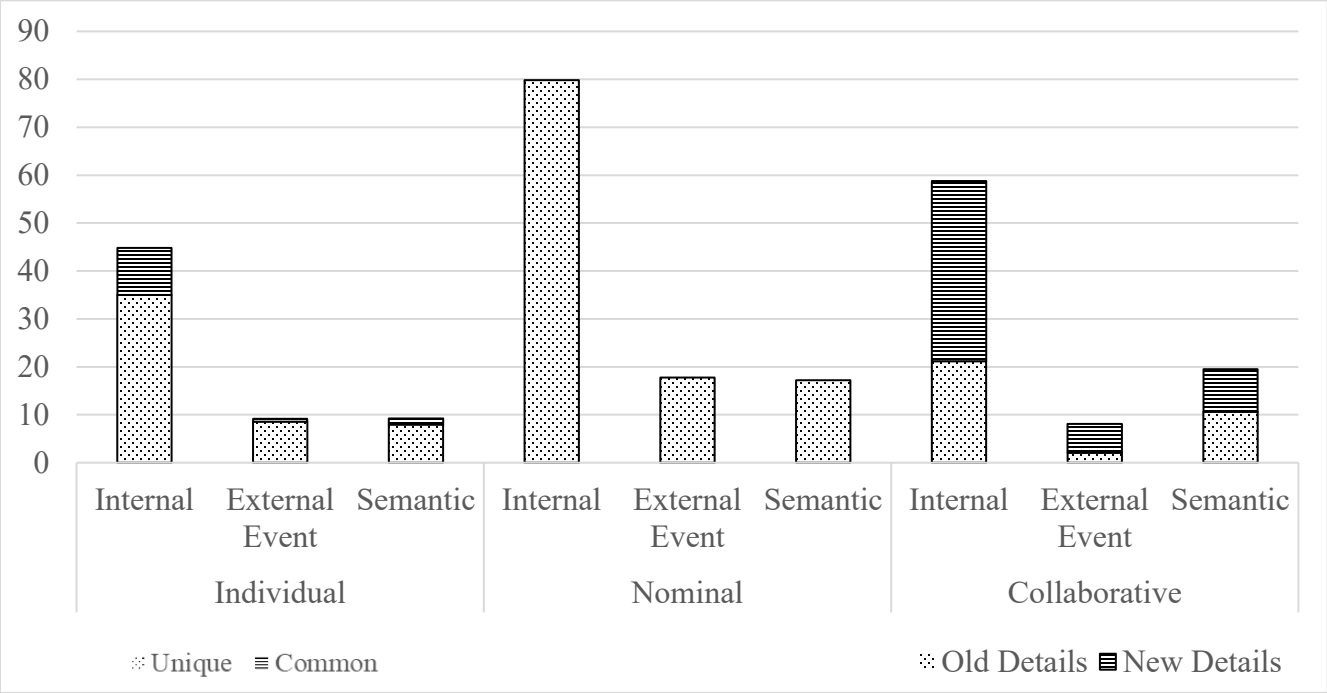

Figure 1

Means of the Three Major Detail Types for Individual, Nominal, and Collaborative recall. Individual scores are subdivided into details that were ('Common') and were not ('Unique') identified by both spouses and collaborative scores are subdivided into 'old details' that were reported at the individual sessions and 'new details' which were not.

Appendix A

ID	Male - individual	Female individual	Nominal Score	Nominal percentage of sum	Male – collaborative	Female - collaborative
1	16	21	33	0.89	14	25
2	29	23	47	0.90	15	11
3	28	93	112	0.93	10	32
4	43	46	74	0.83	15	32
5	24	40	46	0.72	3	54
6	56	65	104	0.86	8	62
7	12	20	27	0.84	10	10
8	42	47	80	0.90	13	40
9	35	30	60	0.92	34	27
10	42	49	83	0.91	40	53
11	17	31	47	0.98	11	12
12	36	30	57	0.86	30	12
13	21	47	58	0.86	14	44
14	35	62	92	0.95	21	44
15	38	32	61	0.87	6	34
16	41	62	95	0.92	24	24
17	37	41	70	0.90	37	33
18	71	62	119	0.89	55	54
19	36	44	79	0.99	6	44
20	63	43	95	0.90	30	31
21	38	49	77	0.89	7	53
22	22	60	78	0.92	8	74
23	11	36	45	0.96	18	17
24	18	56	65	0.88	5	52
25	40	72	104	0.78	36	69
26	45	55	84	0.84	26	43
27	43	42	66	0.78	19	35
28	42	68	99	0.90	32	19
29	54	32	79	0.92	44	19
30	64	81	122	0.84	51	53
31	43	97	133	0.95	33	28
32	21	42	61	0.97	36	24
33	38	69	94	0.88	19	36
34	28	79	90	0.84	8	50
35	68	36	96	0.92	14	56
36	80	64	140	0.97	45	35
37	35	53	78	0.89	34	42
38	33	25	53	0.91	10	26
39	27	37	62	0.97	22	20

Appendix B

The transcripts provide interesting illustrations of different patterns of expertise and contribution and how they influence collaborative recall. In some couples, during collaborative recall, one partner deferred to the other, who provided most of the details. Typically, this involved men's contributions dropping substantially during collaborative recall (see Appendix A). The following selection from Pair 6 provides an instructive example (pseudonyms are used for all proper names in all examples):

F: I had a pink short dress on.
M: Uh huh. Yep.
F: A pink fascinator.
M: Yep.
F: Because I wasn't allowed to wear white. And I was pregnant. And dad took the first lot down to the church. Mum and my sister and my brother.
M: Yep.
F: And then came back and dad and Tara and myself hopped in dad's green prefect.
M: Yep.
F: So off we went to the church. You were already there. And we got to the church and Reverend Jones was standing at the gate going, "go around again". So we went around the block again. And came back to the church. Bethany Church in Shepard Street, Perth. Got back to the church. He said, "go around again". So around we went again. And the next time we were allowed into the church. And Dave's dad was there.
M: slightly inebriated.
F: quite drunk. And was telling us all that he was going to buy us a TV. Which he never did. Anyway the wedding went ahead. It was quite good.
M: Yep.

As can be seen in this example, the man, who had recalled many of these details himself in the individual session, assumed a supporting role while the woman was the central narrator.

Other couples, whose individual narratives were low in overlap, focused on the details that were shared in common when they collaborated at the expense of details that only one partner had recalled (see Appendix A). This can be seen in this example from Couple 31, beginning with a woman's description at individual recall:

> Uh, but when I looked at Paul down the other end of the aisle I thought, "Gosh, he's much shorter than I remember him being…" Ha-ha, and when I stood next to him he was still shorter than I remembered; you know, I was wearing high heels of course, and I couldn't get over why he was so short. And he told me later that he'd had a fit of nerves on that day – this will be interesting to see if he remembers that – and he spent…he was meant to go buy a new pair of shoes, and he puts things off a lot, frequently so he put it off to the morning of the wedding, and then when it came to the crunch he just couldn't do it. So when it came to get dressed he was fussing through his dad's wardrobe and found a pair of very old fashioned dancing – what they called pumps – that don't have heels. Ha-ha, and he borrowed those 'cause they were clean and shiny, and that's why he looked short because they didn't have…they're very flat little soles. So I thought that was really funny.

The man did not mention this at all in his narrative, and then at collaborative recall, the woman attempted to elicit this aspect of the memory, with a less detailed result:

> M: But that was about all, that's all I am remember…of the pre-, pre-wedding time
>
> F: Can I remind you…did you have to go and get some new shoes?
>
> M: No, I didn't get new shoes
>
> F: No, but you were going to get new shoes…
>
> M: I was going to get new shoes, but I wore a pair of my dad's.
>
> F: What were they, what sort of shoes were they?

M: Oh…he's…I don't know how to say…black shoes…

F: Did they have heels?

M: No.

F: And you looked very short

M: I looked very short. Well they didn't have very big heels.

F: But they were shiny…

M: Yeah, yeah. Anyway, that was that, and then we went to the wedding.

It seems from this example that the memory of Paul's height and shoes was either more central to her recall than his, or that he was less comfortable discussing it, so conversation about this topic was truncated during the collaborative session.