The Effect of Member Relationships on Collaborative Extraction Performance

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Abstract

When individuals form social groups with partners to collaboratively discuss certain past events or experiences, the impact of member relationships within such social groups on collaborative retrieval performance remains unclear. The present study investigated the influence of member relationships (relationship type and relationship duration) on collaborative retrieval performance through two experiments using word lists and episodic stories as experimental materials, respectively. Results demonstrated that when word lists served as the memorized material, young stranger groups exhibited collaborative inhibition; whereas when episodic stories served as the memorized material, both young and elderly couple groups exhibited collaborative facilitation. Furthermore, elderly couples employed more effective communication strategies during the collaborative retrieval of episodic stories, and the utilization of these effective communication strategies was associated with higher collaborative retrieval performance. These findings support the critical role of the "transactive memory system" among elderly couples with long-term intimate relationships in collaborative facilitation, providing comprehensive evidence for understanding the impact of member relationships on collaborative retrieval performance.

Full Text

The Influence of Member Relationships on Collaborative Retrieval Performance

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Abstract

When people collaborate in social groups to discuss past events or experiences, the impact of member relationships within these groups on collaborative retrieval performance remains unclear. This study investigated how member relationships (relationship type and duration) affect collaborative retrieval through two experiments using word lists and episodic stories as materials, respectively.

The results demonstrated that when the material consisted of word lists, young stranger dyads exhibited collaborative inhibition. However, when the material comprised episodic stories, both young and older married couples showed collaborative facilitation. Furthermore, older couples employed more effective communication strategies during collaborative retrieval of episodic stories, and the use of these strategies was associated with higher collaborative retrieval performance. These findings support the critical role of "transactive memory systems" between older couples with long-term intimate relationships in producing collaborative facilitation, providing comprehensive evidence for understanding how member relationships influence collaborative retrieval outcomes.

Keywords: collaborative retrieval; member relationships; transactive memory system; semantic memory; episodic memory

1. Introduction

Human memory and social context are often inseparable. In daily life, various social contexts and interaction forms continuously shape people' s memory (Echterhoff et al., 2017). Individuals frequently form long-term or short-term social groups with spouses, relatives, friends, or even strangers to jointly recall shared experiences or events—such as couples reminiscing about romantic pasts, parents and children recalling childhood milestones, colleagues remembering significant national events, or classmates retrieving homework assignments. This form of retrieval involving two or more individuals is termed collaborative recall (刘希平等, 2013; Coman et al., 2009; Cuc et al., 2007; Weldon & Bellinger, 1997; Zhang et al., 2017).

A key question concerns how social context influences group-level collaborative retrieval performance. Weldon and Bellinger (1997) first employed the collaborative recall paradigm, using retrieval quantity as the dependent measure, and found that groups retrieving collaboratively (collaborative groups) recalled more information than any individual retrieving alone, yet less than the non-overlapping sum of the same number of individuals retrieving separately (nominal groups). This phenomenon is known as collaborative inhibition (刘希平等, 2013; Marion & Thorley, 2016). Researchers attribute this to retrieval strategy disruption, where listening to others' retrieval outputs interferes with and disrupts individuals' dominant retrieval strategies, leading collaborative

groups to underperform relative to nominal groups (see 刘希平等, 2014; Basden et al., 2000; Weldon & Bellinger, 1997; Zhang et al., 2017). Subsequent laboratory studies, which typically recruited young strangers to avoid extraneous influences from social relationships and motivations, used category word lists and strictly controlled encoding and retrieval variables—including encoding sequence consistency (Finlay et al., 2000), item similarity (Zhang et al., 2017, Experiment 1), executive control demands during retrieval (Barber & Rajaram, 2011a), response competition strength (Zhang et al., 2017, Experiment 2), retention intervals (Zhang et al., 2020), and retrieval practice frequency (Barber & Rajaram, 2011b)—consistently demonstrating the ubiquity of collaborative inhibition (刘希平等, 2013).

However, collaborative recall in everyday life is not limited to young strangers. As a component of social memory formation, collaborative recall serves important social functions. People often need to recall with socially connected others to maintain group relationships and identities, to imitate, teach, and empathize, to verify their own knowledge and memories, and to gain diverse perspectives within groups (Echterhoff et al., 2005; Harris et al., 2019; Wade & Garry, 2005), ultimately forming shared collective memories (Garfieid, 1993; Johnson & Johnson, 2009; Keeler & Steinhorst, 1995).

Consequently, researchers have begun examining how social relationships among members might influence collaborative retrieval. Some studies using category word lists have compared older married couples with older stranger dyads, finding that relationship type does not eliminate retrieval limitations—both older couples and older strangers showed classic collaborative inhibition when retrieving word lists (Harris et al., 2017; similar evidence in Harris et al., 2011). Other research using unrelated word lists with young friend and stranger dyads similarly found collaborative inhibition in both relationship types (Andersson & Rönnberg, 1995). Based on these findings, we hypothesized that when memory content consists of word lists, relationship type (couple, friend, or stranger) would not eliminate the negative impact on retrieval performance, and collaborative inhibition would emerge across all member relationship conditions.

Other researchers have expanded collaborative recall paradigms to more ecologically valid contexts using materials such as stories (Gagnon & Dixon, 2008), autobiographical memories (Gould & Dixon, 1993; Kemper et al., 1994), factual information (Usita et al., 1998), and prospective memory tasks (Margrett et al., 2011). Ross et al. (2004) recruited older couples to recall shopping lists and identify landmarks, finding that while collaborative inhibition generally occurred, some older couples showed reversed effects—collaborative facilitation (where collaborative groups outperformed nominal groups)—on the landmark task. Further analysis revealed this was due to expertise asymmetry within couples, where one partner was better at remembering landmarks than the other (similar studies in Harris et al., 2011; Johansson et al., 2005). Such expertise effects only become salient with everyday-relevant materials. To more precisely measure relationship effects on collaborative retrieval with episodic materials,

some researchers have incorporated detailed episodic descriptions as additional dependent measures. For instance, Barnier et al. (2014) recruited young and older couples to examine how relationship duration affects collaborative retrieval in intimate relationships, finding that older couples indeed performed better on retrieval detail measures than younger couples. This suggests that collaborating with a long-term intimate partner yields more detailed retrieval for episodic materials. Harris et al. (2017) similarly found that older couples seemed to "go episodic," selectively enhancing their recall of rich contextual details during collaborative retrieval.

These findings indicate that despite the prevalence of collaborative inhibition, collaborative recall can have positive effects under specific member relationships, material types, and measurement indices. Researchers attribute this to shared transactive memory systems (TMS) among members with special relationships, which jointly encode, store, and retrieve information (Grysman et al., 2020). Wegner proposed that TMS relies on group members' individual memories ("who knows what") and effective communication (enabling the group to access each member' s stored information) (Wegner et al., 1985; Wegner, 1987). Thus, TMS comprises two independent components—shared knowledge and communication strategies—that jointly influence group memory performance (Cooke et al., 2007). During memory decline and cognitive aging, collaborating with a long-term partner may provide shared cues and strategic support, leading to better retrieval performance among members with long-term intimate relationships. This facilitative effect appears particularly pronounced with episodic materials, possibly because such materials are more closely linked to shared knowledge and strategies (Blumen et al., 2013; Browning et al., 2018; Harris et al., 2017). Recent studies have extensively examined how effective communication strategies in long-term intimate dyads positively influence collaborative retrieval (Harris et al., 2011; Harris et al., 2014; Harris et al., 2017; Harris et al., 2019; Meade et al., 2009). Based on this analysis, we hypothesized that when memory content consists of episodic materials, collaborative facilitation would emerge in older couples with long-term intimate relationships, and that this memory benefit would be related to shared TMS.

Collaborative recall, as a crucial form of developing group-shared experiences, serves to maintain intimate relationships and intergenerational connections while shaping group identity and self-understanding. Thus, investigating collaborative recall processes and behavioral outcomes across different social contexts and interaction forms holds significant theoretical and practical importance. However, previous research on how different member relationship combinations affect collaborative retrieval remains controversial for three main reasons. First, and most importantly, TMS theory suggests that relationship effects on collaborative retrieval are not simply "good or bad" (Johansson et al., 2005). Even within the same relationship type (e.g., older couples), differences in shared knowledge and communication strategies can produce different collaborative outcomes. Therefore, it is essential to examine the underlying memory processes—how shared knowledge and communication strategies operate in

different relationship groups—to observe resulting collaborative inhibition or facilitation. Second, previous studies have typically used single-factor designs to examine either relationship type (couple, friend, or stranger; see Gould et al., 2002; Harris et al., 2011; Ross et al., 2004) or relationship duration (young vs. older couples; see Barnier et al., 2014; Ross et al., 2008), rarely employing multi-factor designs to simultaneously examine both relationship type and duration. Third, previous studies have used different memory materials varying in self-relevance and episodic richness, and have employed different indices to calculate collaborative retrieval performance, which may contribute to contradictory findings.

In summary, this study conducted two experiments using unpersonal-related word lists and episodic stories as materials (to control for shared experience factors), with couple and stranger relationships as different relationship types and age as an indicator of relationship duration (controlling for marriage duration in couple groups). The aim was to examine how member relationships (considering both type and duration) influence collaborative retrieval performance and the role of shared TMS (particularly communication strategies) in this effect.

2.1 Experiment 1: Purpose and Hypotheses

Experiment 1 examined how member relationships affect collaborative retrieval performance with word list materials. The hypothesis was that when memory content consists of unpersonal-related semantic word lists and retrieval accuracy serves as the performance measure, collaborative groups would show significantly lower retrieval accuracy than nominal groups across all relationship types and age groups, demonstrating collaborative inhibition under all conditions.

2.2.1 Participants

Using G*Power 3.1 software and referencing previous research on relationship type effects (Harris et al., 2017), which reported an effect size of f = 0.58 for retrieval method main effects with word list materials, we set our effect size at f = 0.6. This required a sample of 77 participants to achieve statistical power of 0.95 at $\alpha = 0.05$. We recruited 80 participants, including 40 young adults aged 21–30 years (M = 25.48, SD = 2.80) and 40 older adults aged 60–80 years (M = 65.75, SD = 5.05). All participants had normal or corrected-to-normal vision, no color blindness, no physical or mental illness history, normal cognitive function (verified through one-on-one interviews), and at least a high school education.

The young adult group comprised 10 couples (M = 25.95, SD = 2.54, married 0.5–5 years, similar to Stone et al., 2013) and 10 randomly paired opposite-sex strangers (M = 25.00, SD = 3.02), with no significant age difference between groups, t(38) = 1.10, p = 0.290, Cohen's d = 0.36, 95% CI = [23.43, 27.52]. The older adult group similarly included 10 couples (M = 66.10, SD = 5.21, married 20–50 years, similar to Harris et al., 2011) and 10 randomly paired opposite-sex strangers (M = 65.40, SD = 4.99), with no significant age difference, t(38) =

0.49, p = 0.630, Cohen' s d = 0.16, 95% CI = [65.08, 66.42]. All couple and stranger dyads in this study were opposite-sex (male-female) pairs.

2.2.2 Materials

Materials were selected from a Chinese category word pool used in memory retrieval research (刘旭, 2013). We extracted 108 exemplar words from 24 categories (2-6 exemplars per category) and randomly assigned them to two lists. All exemplars were unambiguous two-character Chinese words. After selection, 20 psychology graduate students (who did not participate in the formal experiment) rated the word familiarity, revealing no significant difference between the two lists, t(106) = −1.14, p = 0.261, Cohen' s d = −0.22.

Experiment 1 employed a 2 (age: young, older) × 2 (relationship type: couple, stranger) × 2 (retrieval method: collaborative, individual) mixed design, with age and relationship type as between-subjects factors and retrieval method as a within-subjects factor. The dependent variable was retrieval accuracy for word materials.

2.2.4 Procedure

This experiment used the classic collaborative recall paradigm. The entire experiment comprised two phases, each including individual study, distraction, and retrieval (individual and collaborative), lasting approximately 50 minutes total (see Figure 1 [Figure 1: see original paper]).

During each phase' s study stage, all participants studied alone. Exemplar words were presented pseudorandomly (five random orders, with equal assignment across conditions to control for order effects) without category cues (to encourage implicit formation of categorical associations, similar to Harris et al., 2017). This was followed by a 2-minute simple math distraction task. The retrieval task included both individual and collaborative conditions, with responses recorded by the experimenter. Each retrieval period lasted 8 minutes. During collaborative retrieval, if one member failed to retrieve an item for 5 seconds, retrieval switched to the other member; if both failed for 30 consecutive seconds, the session ended. During individual retrieval, if a participant failed for 30 seconds, the session ended. The entire retrieval process was audio-recorded.

2.3 Results

Following previous research, we calculated nominal group retrieval accuracy by summing the two individuals' retrieval scores in the individual condition, counting overlapping items only once, and compared this to collaborative group performance to assess collaborative effects (see 刘希平等, 2013 for calculation method).

Retrieval accuracy across conditions is presented in Table 1 . A three-way repeated measures ANOVA revealed a significant main effect of age, F(1, 36) =

33.32, $p < 0.001$, $^{2}p = 0.48$, 95% CI = [0.16, 0.21], indicating that older adults performed worse than young adults across conditions, consistent with cognitive aging theory. Additionally, the three-way interaction between age, relationship type, and retrieval method was significant, $F(1, 36) = 5.06$, $p = 0.031$, $^{2}p = 0.12$, 95% CI = [0.13, 0.23].

Simple-simple effects tests indicated that young stranger dyads showed significantly lower retrieval accuracy in collaborative versus nominal conditions, $F(1, 36) = 5.74$, $p = 0.022$, $^{2}p = 0.14$, 95% CI = [0.23, 0.32], demonstrating classic collaborative inhibition (see Figure 2 [Figure 2: see original paper]). However, older stranger dyads showed no significant difference between retrieval methods, indicating equivalent performance between collaborative and nominal groups. For couple conditions, the age × retrieval method interaction was not significant, nor were the main effects of age or retrieval method, suggesting that both young and older couples performed similarly across collaborative and nominal conditions.

2.4 Discussion

Experiment 1 used unpersonal-related word lists and retrieval accuracy as the dependent measure to examine and compare performance across relationship types and age groups. The results showed that young stranger dyads exhibited classic collaborative inhibition, with nominal groups outperforming collaborative groups, consistent with previous research (Basden et al., 2000; Weldon & Bellinger, 1997). However, older stranger dyads, young couples, and older couples showed no differences between collaborative and nominal groups, contradicting our hypothesis. This may be because exemplar words were presented without category cues, allowing experienced partners—particularly in couple groups—to encode items associatively based on life experience rather than categorical properties, thereby producing collaborative advantages during retrieval (similar to Harris et al., 2017). This pattern aligns with TMS influences on collaborative retrieval.

To further clarify how TMS among members with special relationships affects collaborative retrieval, Experiment 2 used episodic stories more closely linked to TMS, combined with communication strategy coding, to examine member relationship effects on collaborative retrieval. This experiment aimed to explore the potential positive effects of collaborative retrieval on everyday episodic memory and its compensatory role for age-related memory decline.

3.1 Experiment 2: Purpose and Hypotheses

Building on Experiment 1, Experiment 2 used episodic stories as materials, with propositional recall accuracy and propositional recall details as dependent measures, to examine member relationship effects on collaborative retrieval and the potential role of TMS. We hypothesized that with unpersonal-related episodic stories, older married couples would show collaborative facilitation

(higher propositional recall accuracy and details in collaborative versus nominal groups). Additionally, older couples would use more effective communication strategies than young couples, and strategy use would positively correlate with collaborative retrieval performance.

3.2.1 Participants

Using G*Power 3.1 and referencing previous research (Browning et al., 2018) reporting an effect size of f = 0.50 for retrieval method main effects with episodic materials, we determined that 107 participants were needed to achieve power of 0.95 at $\alpha = 0.05$. We recruited 120 participants, including 60 young adults aged 21-30 years (M = 26.12, SD = 1.77) and 60 older adults aged 60-80 years (M = 70.36, SD = 6.51). All participants had normal or corrected-to-normal vision, no color blindness, no physical or mental illness history, and normal cognitive function (verified through interviews and Montreal Cognitive Assessment (MoCA) for older adults, showing no cognitive differences between older couple and stranger groups, t(58) = 0.30, p = 0.768, Cohen' s d = 0.08, 95% CI = [24.55, 24.82]). All had at least a high school education.

The young group included 15 couples (M = 26.23, SD = 1.94, married 0.5-5 years) and 15 randomly paired strangers (M = 26.00, SD = 1.60), with no age difference, t(58) = 0.51, p = 0.613, Cohen' s d = 0.13, 95% CI = [25.89, 26.34]. The older group included 15 couples (M = 69.73, SD = 6.45, married 20-50 years) and 15 randomly paired strangers (M = 71.00, SD = 6.61), with no age difference, t(58) = 0.75, p = 0.456, Cohen' s d = 0.20, 95% CI = [68.50, 72.23]. The Quality Relationship Index (QRI) revealed no significant intimacy quality differences between older and young couples, t(58) = 0.58, p = 0.564, Cohen' s d = 0.15, 95% CI = [32.38, 33.42].

3.2.2 Materials

Experiment 2 used two equivalent memory materials: brief stories selected from *Reader' s Digest*, each approximately 400 characters. Following Kintsch and van Dijk' s (1978) criteria, we conducted propositional analysis. Story A contained 65 propositions in 18 sentences (458 characters) about a teacher giving up a bus seat; Story B contained 64 propositions in 18 sentences (443 characters) about a noodle shop worker handling a customer dispute. To control for text consistency, we used the "Wenxin" Chinese psychological analysis system developed by the Institute of Psychology, Chinese Academy of Sciences (http://ccpl.psych.ac.cn/textmind/) to ensure pronoun, verb, and emotion word frequencies differed by no more than three between stories. Stories were presented via standardized audio at 1.8 characters per second.

Experiment 2 employed a 2 (age: young, older) × 2 (relationship type: couple, stranger) × 2 (retrieval method: collaborative, individual) mixed design, with age and relationship type as between-subjects factors and retrieval method as a within-subjects factor. Dependent variables included propositional recall ac-

curacy, propositional recall details, and frequencies of different communication strategy types in collaborative groups.

3.2.4 Procedure

The procedure was similar to Experiment 1, comprising two phases with individual study and retrieval, lasting approximately 30 minutes. Participants studied the stories individually (listening carefully) for about 4 minutes. After a brief rest, retrieval used free recall, with each retrieval period (individual or collaborative) limited to 3 minutes. If participants stopped before 3 minutes, the experimenter prompted them to continue or elaborate; if they continued beyond 3 minutes, they were allowed to proceed until no further information could be retrieved.

In collaborative conditions, dyads sat together on one side of a rectangular table with the experimenter opposite; in individual conditions, participants sat alone across from the experimenter. All retrieval sessions were audio-recorded.

3.2.5 Scoring and Coding

Propositional Recall Accuracy and Details. A proposition is defined as the smallest knowledge unit whose truth value can be independently judged, comprising a relational element (predicate, typically a verb) and one or more arguments (subjects or objects, typically nouns or pronouns). Successful retrieval required complete recall of both arguments and relational elements. Modifiers (adjectives and adverbs) within propositions were defined as detail elements, serving as important indicators of retrieval quality.

Propositional recall accuracy (number of correctly retrieved propositions / total propositions) reflected retrieval quantity. Scoring followed Kintsch and van Dijk' s (1978) system, with two independent raters showing high inter-rater reliability ($r = 0.73$, $p < 0.001$). Propositional recall details (sum of detail scores for correctly retrieved propositions / number of correctly retrieved propositions) reflected retrieval quality, using a 1–4 point cumulative scoring system: 1 point for correct argument retrieval, 1 additional point for correct relational element, 1 point for partial modifier retrieval, and 2 points for complete modifier retrieval (see Table 2 for examples). Two raters showed high reliability ($r = 0.86$, $p < 0.001$).

Communication Strategies. Based on Harris et al. (2019) and Meade et al. (2009), two positive communication components encompassing five strategy types effectively predict group retrieval performance: (1) Group enhancement, including successful cue, fail cue, and repeat; and (2) Metacognitive strategies, including positive comment and recall out. Two raters independently coded strategy frequencies from audio recordings, showing high reliability ($r = 0.90$, $p < 0.001$). Table 4 provides detailed examples and frequency counts for each strategy.

3.3 Results

3.3.1 Propositional Recall Accuracy Across Conditions

Propositional recall accuracy results are presented in Table 3 . A three-way repeated measures ANOVA revealed significant main effects of relationship type, $F(1, 56) = 4.18$, $p = 0.046$, $^2p = 0.37$, 95% CI = [0.40, 0.48], and retrieval method, $F(1, 56) = 32.63$, $p < 0.001$, $^2p = 0.07$, 95% CI = [0.38, 0.48], indicating that couples outperformed strangers and collaborative groups outperformed nominal groups with episodic stories. The three-way interaction was also significant, $F(1, 56) = 9.89$, $p = 0.003$, $^2p = 0.15$, 95% CI = [0.36, 0.50].

Simple-simple effects tests showed that young couples exhibited significantly higher propositional recall accuracy in collaborative versus nominal conditions, $F(1, 56) = 6.87$, $p = 0.011$, $^2p = 0.11$, 95% CI = [0.36, 0.50], demonstrating collaborative facilitation. Older couples also showed significant differences, $F(1, 56) = 74.78$, $p < 0.001$, $^2p = 0.57$, 95% CI = [0.43, 0.56], indicating collaborative facilitation (see Figure 3 [Figure 3: see original paper]). To compare facilitation magnitude, we calculated the difference between collaborative and nominal group accuracy. A t-test revealed that older couples showed significantly greater facilitation than young couples, $t(28) = -4.18$, $p < 0.001$, suggesting that older adults benefit more from social relationships during collaborative retrieval.

3.3.2 Propositional Recall Details Across Conditions

A three-way ANOVA on propositional recall details (see Table 3) showed a marginally significant main effect of retrieval method, $F(1, 56) = 3.79$, $p = 0.057$, $^2p = 0.06$, 95% CI = [2.02, 2.35], with no significant two-way or three-way interactions.

To further examine detail differences, we categorized details into two levels: scores 1-2 as Level 1 and scores 3-4 as Level 2. The difference in detail levels between collaborative and nominal groups was analyzed via chi-square test, revealing that older couples showed significantly greater detail level differences than young couples, $^2(1, n = 30) = 4.62$, $p = 0.032$, $\phi = 0.39$, 95% CI = [0.27, 0.66], indicating that older couples recalled more details during collaborative retrieval.

3.3.3 Communication Strategy Analysis in Collaborative Groups

Raters coded communication strategies from collaborative sessions (see Table 4). A multivariate ANOVA on total strategy frequencies, with Bonferroni-corrected $\alpha = 0.01$, revealed a significant main effect of relationship type, $F(1, 56) = 9.37$, $p < 0.001$, $^2 = 0.47$, 95% CI = [1.78, 2.50], and a significant age × relationship type interaction, $F(1, 56) = 5.12$, $p = 0.001$, $^2p = 0.33$, 95% CI = [1.63, 2.64]. Simple effects tests showed that older couples used more strategies than young couples, $F(1, 56) = 2.99$, $p = 0.019$, $^2p = 0.23$, 95% CI = [1.84, 2.85], while

young strangers used more strategies than older strangers, $F(1, 56) = 3.27$, $p = 0.012$, $^2p = 0.24$, 95% CI = [1.42, 2.43].

Separate ANOVAs for each strategy, with follow-up simple effects tests, revealed that older couples used more successful cues, repetition, and positive comments than young couples: successful cue, $F(1, 56) = 8.83$, $p = 0.004$, $^2p = 0.14$, 95% CI = [2.84, 3.99]; repetition, $F(1, 56) = 7.57$, $p = 0.008$, $^2p = 0.09$, 95% CI = [3.98, 5.10]; positive comment, $F(1, 56) = 5.71$, $p = 0.020$, $^2p = 0.12$, 95% CI = [2.09, 3.09]. Conversely, young strangers used more successful cues, fail cues, repetition, and recall out than older strangers: successful cue, $F(1, 56) = 5.26$, $p = 0.026$, $^2p = 0.09$, 95% CI = [1.74, 2.89]; fail cue, $F(1, 56) = 6.92$, $p = 0.011$, $^2p = 0.11$, 95% CI = [0.83, 1.77]; repetition, $F(1, 56) = 4.14$, $p = 0.047$, $^2p = 0.07$, 95% CI = [2.71, 3.83]; recall out, $F(1, 56) = 8.70$, $p = 0.005$, $^2p = 0.13$, 95% CI = [0.95, 1.78].

Pearson correlations between strategies and propositional recall accuracy showed significant relationships for successful cue, repetition, positive comment, and recall out ($r_1 = 0.91$, $r_2 = 0.80$, $r_3 = 0.83$, $r_4 = -0.45$, all $p < 0.001$). Separate analyses for young and older couples revealed that successful cue, repetition, and positive comment significantly predicted recall accuracy in both groups. Linear regression analyses confirmed these strategies as significant predictors of recall accuracy in both young and older couples, with no significant differences in β coefficients between groups (all $p > 0.30$).

Correlations with propositional recall details showed that in young couples, successful cue, repetition, and recall out were significantly related to details ($r_1 = 0.68$, $r_2 = 0.55$, $r_3 = -0.68$), while in older couples, successful cue, repetition, and positive comment were significant ($r_1 = 0.92$, $r_2 = 0.73$, $r_3 = 0.89$). Regression analyses confirmed these patterns, with no significant differences in β coefficients between age groups for successful cue and repetition ($p > 0.07$).

3.4 Discussion

Experiment 2 used episodic stories with propositional recall accuracy and details as dependent measures, combined with communication strategy analysis, to examine performance across relationship types and age groups. Results showed collaborative facilitation for both young and older couples when using propositional recall accuracy, with couples outperforming nominal groups. Relationship type also positively influenced retrieval details. Communication strategy analysis revealed that older couples used more positive strategies (especially successful cues, repetition, and positive comments), which predicted retrieval performance.

These findings suggest that through extensive daily collaborative experience, married couples develop interdependent, complementary transactive memory systems. According to TMS theory, shared experiences and strategies enable long-term intimate partners—particularly older couples—to benefit more from collaborative retrieval of episodic or autobiographical memories. These results

support TMS' s important role in collaborative retrieval (see Harris et al., 2011; Johansson et al., 2005).

4 General Discussion

This study used the classic collaborative recall paradigm with word lists and episodic stories to examine how member relationships influence collaborative retrieval. With word lists, young stranger dyads showed collaborative inhibition, while older stranger, young couple, and older couple dyads showed no differences between collaborative and nominal groups. With episodic stories, both young and older couples demonstrated collaborative facilitation in propositional recall accuracy and details, whereas stranger dyads showed no effects. Older couples used more effective communication strategies than young couples, and these strategies predicted higher collaborative retrieval performance.

Experiment 1 replicated classic collaborative inhibition in young strangers, consistent with our hypothesis and previous findings. This supports the retrieval strategy disruption hypothesis, where listening to strangers' retrieval outputs disrupts individuals' strategies and reduces group potential (see 刘希平等, 2014; Basden et al., 2000; Weldon & Bellinger, 1997; Zhang et al., 2017). However, contrary to our hypothesis, older strangers, young couples, and older couples showed no collaborative inhibition with word lists.

The absence of collaborative inhibition in older strangers suggests that collaborative retrieval' s negative effects do not simply increase with age, even for non-episodic materials. This hints at partial compensatory effects of collaboration on memory aging. However, floor effects may have masked differences, as older strangers' retrieval accuracy was universally low (both collaborative and nominal groups < 0.15). Future research should examine collaborative retrieval effects across varying task difficulties in aging populations.

Additionally, the lack of collaborative inhibition in both young and older couples with word lists differs from some previous laboratory studies (Harris et al., 2011; Harris et al., 2017; Marion & Thorley, 2016). Most previous couple research used Western samples, finding that relationship type cannot eliminate collaborative inhibition' s negative effects with word lists (Harris et al., 2008; Harris et al., 2011). However, our Chinese couples may have different communication patterns (吴婷等, 2016), with East Asian cultures emphasizing cooperation and coordination (袁加锦等, 2014; Soto et al., 2011). From a TMS perspective, effective couple collaboration can reverse strategy disruption' s negative effects (Hollingshead, 1998a, 1998b; Wegner et al., 1991). Thus, Chinese couples' emphasis on cooperation and accommodation (袁加锦等, 2016) may enable them to rely on daily-life TMS even with word lists, eliminating collaborative inhibition. However, without cross-cultural comparisons, this interpretation requires empirical verification.

Previous research on relationship type effects has primarily used non-episodic word lists. Few studies have examined relationship effects with episodic mate-

rials (Grysman et al., 2020; Harris et al., 2011; Harris et al., 2017; Stone et al., 2013). Experiment 2 extended this work using episodic stories combined with TMS indicators to examine relationship and age effects on propositional recall accuracy and details. Both young and older couples showed collaborative facilitation, consistent with previous findings. TMS theory suggests that intimate partners benefit more from collaboration in familiar contexts (Wegner, 1987). Our procedure—partners sitting together listening to stories—mirrors everyday situations (e.g., couples listening to radio or watching TV), enhancing ecological validity.

However, when using propositional recall details, between-group differences were weaker, only emerging when analyzing detail level differences. Possible explanations include: (1) our stories were relatively simple with fewer details than autobiographical materials, limiting detail-level effects; and (2) previous research shows a trade-off between recall quantity and detail richness (Harris et al., 2017), where couples' superior accuracy may have partially masked their detail advantage. Future research should select episodic materials with greater self-relevance, difficulty, and detail richness.

Communication strategy analysis revealed that older couples used more group enhancement (successful cues, repetition) and metacognitive strategies (positive comments) than young couples, with positive strategies predicting retrieval performance. This aligns with previous research showing that communication patterns influence collaborative retrieval (Harris et al., 2011). Experts use more elaboration, explanation, correction, and repetition strategies than novices (Meade et al., 2009), and couples use more elaboration than strangers (Gagnon & Dixon, 2008). Groups using more elaborative strategies show better retrieval (Gould et al., 1991), and positive communication strategies promote autobiographical recall, particularly for men (Grysman et al., 2020). Our findings support and extend these conclusions by analyzing strategy effects across different relationship durations.

While this study systematically examined member relationship effects on collaborative retrieval, several limitations warrant caution. First, our sample size per cell, though based on power analysis, was relatively small; future research should increase sample sizes to enhance stability. Second, although we used experimental paradigms with different materials and measures, other factors such as prior experience, expertise, gender differences, individual differences, and relationship quality were not strictly controlled. Future research should more comprehensively assess relationship effects to maximize collaborative retrieval' s positive impact on socially shared memory and inform applications in legal, educational, and clinical settings.

5 Conclusion

With word list materials, young stranger dyads showed collaborative inhibition, while young couples, older couples, and older strangers showed neither

inhibition nor facilitation. With episodic story materials, both young and older couples demonstrated collaborative facilitation, while young and older strangers showed no effects. Furthermore, older couples used more effective communication strategies during collaborative retrieval of episodic stories, and these strategies predicted retrieval performance. These findings confirm the advantages of older couples with long-term intimate relationships in collaborative retrieval tasks and support the critical role of transactive memory systems in producing collaborative facilitation.

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