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Gender Differences in Relational Memory

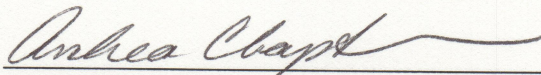
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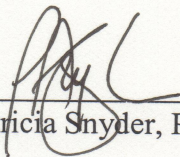
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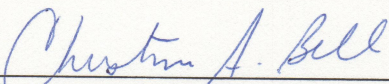
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Gender Differences in Relational Memory

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Abstract

The purpose of this study was to determine if women have a superior memory recall for relational events as compared to men. Also under investigation was the cause of gender differences in relational memory. I hypothesized that women would have superior recall for both positive and negative events as compared to men, due to greater detail in encoding relational events. Twenty-four male/female couples participated in this study. Each couple together selected, and then individually wrote about a positive and a negative event that occurred in the past 2-5 years in their relationship. They also described one event from their own individual past that they did not experience together, for comparison purposes. The participants completed a demographics survey, the Bem Sex Role Inventory (BSRI), Sternberg's Triangular Theory of Love Inventory, a relationship satisfaction survey, and the Autonomy and Relatedness Inventory (ARI). Females described both positive and negative events in greater detail than did the males, but did not differ from males in the amount of detail used to describe neutral events. This supports the hypothesis that females have superior relationship schemata, and encode relational events in greater detail.

Gender Differences in Relational Memory

Previous research has well established the finding that women have greater recall abilities for relational events (Fujita, Diener & Sandvik, 1991; Ross & Holmberg, 1992; Seidlitz & Diener, 1998); however, the reasons for this difference remain less clear. The current study sought to determine the cause of this gender difference in memory for relational events. There are several possible variables that may influence this difference, including greater encoding through rehearsal and elaborative processing at the time of event, the degree of emotion experienced at the time of the event, mood at time of recall, cultural-mediated gender roles, the role of transactive memory in relationships, and the effects of relationship satisfaction on memories of relational events.

Autobiographical/Episodic Memory

To understand gender differences in relational memories, it is important to first understand the cognitive processes that are involved in storing and retrieving these types of memories. Memories for personally experienced events are stored in an individual's episodic long-term memory (Ashcraft, 2002). An individual's episodic memory allows the individual to both store and retrieve events that are experienced throughout their lifetime (Wheeler, Stuss, & Tulving, 1997). These events are also known as autobiographical memories because they are unique to each individual's experiences. One method for storing episodic memories into long-term memory is through rehearsal. Rehearsal is "a deliberate recycling or practicing of the contents of the short-term memory store" (Ashcraft, 2002, p. 215). Atkinson and Shiffrin (1968) propose that rehearsal effects memory in two ways. First, rehearsal prevents information from being lost by keeping it in short-term memory. Second, the longer this information is maintained in short-term memory, the more likely it is that it will be stored in episodic long-term memory.

The way in which information is stored or organized in episodic memory can also influence an individual's ability to recall this information. Information that is grouped together based on category membership can be recalled more accurately. For example, an individual who is an expert in psychology will store their knowledge about psychology in the same category in their memory; as a result, they are able to recall information related to psychology much quicker than an individual that is in an introductory psychology class. Retrieval of information from episodic memory depends on its availability or accessibility. Two factors that can effect retrieval are decay and interference. Retrieval can be more difficult when the information has not been used recently. Similarly, information can be difficult to retrieve due to the introduction of similar activities that interfere with accurate retrieval of the information from episodic long-term memory (Ashcraft, 2002).

Researchers have found that women frequently use imagery, an encoding and retrieval technique, during recall more often than men to elicit memories (Harshman & Pavio, 1987). By using imagery, women are able to store information as both verbal and visual codes, because they associate a visual image with the information they are trying to store. Later, when they try to retrieve the information, they are at an advantage because the information was encoded into memory twice, both verbally and visually. This "double encoding" makes the information easier to retrieve because females are able to locate the information using either the visual representation or the verbal representation (Ashcraft, 2002). In addition, events that are accompanied by intense emotions at the time of encoding can be recalled more accurately. This type of memory is known as a flashbulb memory (Brown & Kulik, 1977). More accurate recall may be due to the fact that affective events may be processed more thoroughly (i.e., greater rehearsal and elaboration), resulting in greater integration with other similar knowledge

structures in episodic long-term memory, and thus creating an increased number of retrieval pathways. It has also been theorized that high affect intensity at time of retrieval can activate pathways to similar events, which makes recall for these items easier (Blaney, 1986).

Thomas and Diener (1990) were interested in the impact that emotion has on memory. As aforementioned, affective events are thought to be processed more thoroughly, increase the number of pathways to the event, and make retrieval easier. To test this theory, they examined memory accuracy for ecologically natural emotions, which they defined as emotions that occur in an individual's daily life, in two different studies. In the first study, over a three-wk period, participants completed mood report forms four times daily based on experiences that they had during the testing period. The researchers randomly selected events from the mood reports. In the second study, participants completed mood report forms at the end of each day for a six-wk period. In addition to the mood report forms, participants in each of the studies also completed pre-estimates of emotion 1-wk prior to completing the mood reports and post-estimates 1-wk after completing the mood report forms. To determine accuracy in recall, the participants estimated the *intensity* and *frequency* of their emotional experiences at the end of their testing periods in each of the studies conducted. Thomas and Diener found that for both positive and negative events, retrospective estimates of *intensity* were significantly higher than the actual *intensities* experienced at the time of the event. In addition, positive *frequencies* were significantly lower than the actual positive *frequencies* versus negative *frequencies*. Thomas and Diener conducted a multiple regression analysis to test their hypotheses. The results also indicated that individuals confuse the *frequency* of their emotions with their *intensity*, especially when recalling negative emotions. The researchers found that *frequency* of emotion is more accurately recalled than the *intensity*. Thomas and Diener (1990) concluded that because

positive and negative *intensities* are overestimated, emotional events are more salient at time of recall than neutral events.

There are several implications of these findings. First, the overestimation of positive and negative intensity suggests that individuals perceive their lives as more intensely emotional than they actually are. Second, the majority of memory biases, in which emotional frequency interferes with intensity and thus decreases accuracy, still exist after the individuals increase their attention to the retrieval of the event. Third, biases related to emotional intensity must be inherent during the retrieval stage, not during the encoding stage of an event. Biases with regard to accuracy of recall, however, occur during encoding because the post-estimates of emotion improved from the pre-estimates. Thomas and Diener (1990) concluded that memories might be based on conceptualizations, rather than the actual event. As a result, they believe that the retrieval of mood experienced during the event may be the mood individuals expect to be associated with the event they are recalling, not the actual mood they experienced during that event.

In general, results indicate that emotional events are easier to recall. Although several reasons why have been tested, the results are not conclusive. The best explanation appears to be that intense emotions experienced at time of event, result in deeper encoding.

Gender Differences in Emotional Memory

The general finding that individual recall for emotional events is better than non-emotional events is especially true for females. Canli, Desmond, Zhao and Gabrieli (2002) tested the premise that affective experiences are more memorable than neutral experiences. In addition, they also predicted that there are gender differences in memories for emotional events. Canli et al. tested two possible reasons for why females have superior recall for emotional events

as compared to men: (1) they experience events as more affectively intense; and (2) they use a more elaborative style of encoding and rehearsing to store events in memory. They presented each participant with various photographs and asked the participants to rate them on a scale from not emotionally intense at all to extremely emotionally intense. While viewing the photographs, they monitored the participants' brain activity by an fMRI. Three wks after the first trial, the participants viewed another series of photographs, which included the photos from the first trial that they had ranked as extremely emotionally intense. They then identified which photographs they believed they had previously seen. Canli et al. found that the women recalled a significantly greater number of the previous photos than did the men. In addition, during the encoding phase, the fMRI showed that the females' left side of their amygdala was activated whereas in the males, the right side of their amygdala was activated. This supports the hypothesis that females encode events into memory differently than do males. The left amygdala is associated with conscious learning and the right with unconscious learning (Canli et al., 2002). This supports the idea that females encode events in greater detail due to conscious rehearsal of events, and thus, more elaborative encoding. In addition, the results of the fMRI showed that females had significantly more activated brain regions that correlated with emotional intensity, which supports the researchers hypothesis that females experience events as more affectively intense than do males. Canli et al. concluded that women's superior retrieval of emotional pictures is due to enhanced integration of brain processes associated with affective events and the elaborative encoding of these events into memory.

Seidlitz and Diener (1998) were interested in the effects of current mood intensity at time of retrieval. They proposed that both males and females would be better able to recall events that were consistent with their present mood. They suggested rehearsal as a possible explanation of

why females can better retrieve events from episodic long-term memory better than males. Following the experience of affective events, women think about the event over and over again, in other words, they rehearse the event. Due to this rehearsal, they increase the number of pathways to the event, and the information becomes organized more efficiently. Men have a more difficult time recalling an event because they do not rehearse the event as do women, which results in forming less pathways to the event. Thus, according to this view, females and males encode events similarly at time of event, but subsequent greater rehearsal by females, is what leads to their superior recall. The final possible explanation Seidlitz and Diener proposed for females' greater recall was that females encode these events in greater detail at the time of the event, due to the fact that females experience these events with greater emotional intensity. To test these competing hypotheses, they conducted three different studies. They examined gender differences first, in mood intensity at time of retrieval; second, in rehearsal of events; and third, in detail of encoding. In all three studies, they found that women had a significantly higher rate of recall for positive stimuli, and in studies 1 and 2, they found that women also had a significantly higher rate of recall for negative stimuli.

The first study conducted by Seidlitz and Diener (1998) examined sex differences in life events to test the effects of mood consistency on retrieval. In this study, the participants completed a modified version of M. W. Fordyce's Happiness Measure to assess their emotional state at the time of the study (Seidlitz & Diener, 1998). Next, they recalled and listed as many positive and negative life events that they could in a 3-min period, in addition to briefly describing each event. Seidlitz and Diener found that women recalled more positive and negative events than did men. Contrary to the 1st hypothesis, they also found that participant's

mood intensity during the study did not have an impact on their memory recall. Thus, mood similarity at the time of recall does not appear to influence recall of emotional events.

In the second study, Seidlitz and Diener (1998) examined whether or not gender differences in recall are based on rehearsal of events. This is based on the idea that rumination of valenced life events, both positive and negative, facilitates retrieval in three ways. First, it strengthens retrieval pathways to the event. Second, it strengthens the memory of the event through elaborative processing. Third, rumination also integrates events into similar knowledge structures. At the first session, participants recalled as many positive or negative events as they could in 3 min that occurred within the past 3 years. In addition to listing the events, they also wrote a brief description of each event. Once they were finished, they had to list as many positive and negative United States historical events that occurred since 1900 that they could, using the same procedure as the lifetime events. After an 11-mo time period elapsed, the participants recalled the events from the previous session. In addition, the participants also recalled events that occurred in the past week at randomly selected 1-hr intervals for 90 s each. Seidlitz and Diener hypothesized that if females rehearse events more frequently than males, than their recall of the events after the 11-mo period should demonstrate less decay than the males. Although females recalled more positive and negative events than did the males, there were no significant differences in recall over time between sexes. This suggests that differences in memory recall may not be due to differences in the amount of rehearsal. They did find that that there was a significant difference in the recall of neutral personal events between men and women during the recall test of random events in the second testing session at the 11-mo period. In addition, they found that there was no significant difference in the recall of historical events, indicating that females are not better at recalling general, non-autobiographical events than men.

In this study, to measure the gender differences in rehearsal for positive and negative events, Seidlitz and Diener compared recall at two different time periods. However, to test the gender differences in memories for neutral emotional and non-emotional events, the researchers only looked at the results of recall tests from one time period. This difference in the methods of testing gender differences in recall for emotional versus neutral events could have contributed to the finding that females are better at recalling neutral events rather than emotional events, which was not consistent with the researcher's hypothesis. In the current study, both emotional and neutral events will be examined using the same method. In addition, detail of encoding will be examined as the primary cause of gender differences in recall, rather than rehearsal, as it was in the Seidlitz and Diener study.

In the third study, they looked specifically at gender differences in the recall of both positive and negative events due to the emotional intensity associated with the event at the time of encoding. They hypothesized that females would recall positive and negative events more accurately because they experience these events as more emotionally intense, which leads to greater detail in encoding. To test this theory, Seidlitz and Diener (1998) had each participant describe their worst event and best event each day over a six-wk period. They also rated their emotional intensity during each event. At the end of the six wks, the participants had to recall events that they had previously described using wording as close as possible to each event's original description. In addition, participants also arranged the events in the order they occurred. The researchers tested whether recall differences were due to the fact that females encode information in greater detail at the time of event than males because they experience the event with greater emotional intensity. To measure detail in encoding, they used a simple count of the number of words used to describe each event on the daily report; the greater number of words

used to describe each event would reflect greater detail in encoding. In addition to word count, independent raters also determined whether or not word count was indicative of the level of detail provided, by rating a sample of 682 events. Seidlitz and Diener found that, as expected, females recalled more events more accurately than did the males. In addition, Seidlitz and Diener noted that participants at the delayed recall phase repeated events that were described on their daily questionnaires. Women, however, listed a significantly higher number of unique events than did the males. Males' inability to distinguish between events can be attributed to the lack of detail in which they encoded these events. Males encode events in less detail, therefore they only store a general summary of each event, which leads to less distinguishable events. Conversely, women have more unique events to recall because they were encoded in greater detail. Although this study did find that females encode emotional events in greater detail, the researchers did not explore the reasons for these gender differences, namely socialization (Seidlitz & Diener, 1998). In addition, relational memories were not necessarily examined.

To summarize, Seidlitz and Diener (1998) hypothesized that three factors contribute to females' superior memory recall: mood intensity at time of retrieval; rehearsal; and detail of encoding. In all three studies they found that females had a higher rate of recall for positive events, and in studies 1 and 2, females had a higher rate of recall for negative events. This superior recall was not due to rehearsal or mood intensity at time of recall. They did, however, find that females encode events in greater detail than males. In the current study, detail of encoding will be examined more thoroughly. An additional limitation to note is that the researchers in this study examined emotional events rather than relational events. Thus, it is not clear whether detail in encoding explains gender differences in relational memory. In addition, gender differences in detail in encoding were measured based on different events. In the current

study, gender differences in encoding were measured by comparing the same events across males and females.

Skowronski and Thompson (1990) believed that cultural gender roles could effect females' ability to recall events. Females are much more likely to be concerned with recording the dates of important relationship events than are males because females have been socialized to do so. Skowronski and Thompson argued that constant tracking of important dates can lead to the development of a temporal reference schema, which should, in turn, facilitate recall. To test this hypothesis, Skowronski and Thompson conducted a meta-analysis of four studies previously conducted by Thompson. In the first study, participants recorded and dated one event per day for a 12-wk period. In addition, they predicted how memorable they believed each event to be. The participants also rated how pleasant each experience was. During the thirteenth wk, the participants completed a memory test. The researchers read each participant's list back to them. After each event was read, the participants rated the event's memorability. In addition, the participants also recalled the date of each event. This occurred in two different conditions. In the first condition, the participants began dating the events immediately after each one was read to them. In the second condition, the participants began dating the events after half of the items were read back to them. In addition, the items were also presented again for dating. In both conditions, the participants received two dates, one from the fourth wk, and one from the ninth wk as reference points to facilitate memory for the other dates. Skowronski and Thompson found that results from each condition did not differ, meaning the time of dating and the reference points did not effect dating accuracy. Studies 2-4 were similar, with only slight differences in the method. Overall, they found that women recalled more dates and also had longer, more detailed diary entries than did the men (Skowronski & Thompson, 1990). Although

Skowronski and Thompson examined personal events, they were not necessarily relational. In addition, they also did not examine detail in encoding; they associated longer diary entries with higher rates of self-disclosure rather than detail of encoding.

Fujita, Diener, and Sandvik (1991) proposed that women experience personal events with more emotion than do men, which leads to women's more accurate retrieval of personal events. Affective intensity refers to the degree of emotion experienced during an event. To test their hypothesis, Fujita et al. used three hedonic level measures, which measure the frequency of emotion, and three affect intensity measures. To measure hedonic level, participants reported the frequency that they felt positive and negative emotions twice during the semester. Similar to affect intensity, hedonic measure was completed by an observer. In addition, the participants completed a daily mood report for 42 consecutive days. The participants had to report the degree of positive and negative emotions that they experienced each day. The first affective intensity measure that was used was a self-report of the Affective Intensity Measure (AIM). This measure reports how intensely participants experience emotions. The second measure of affective intensity was an observer-reported AIM completed by participant's family members and friends, according to how they thought the participants would answer. The third measure was a memory performance intensity measure. The participants recalled both positive and negative experiences in a timed period. The participants wrote down as many events as they could from four different categories. The categories included lifetime happy events, lifetime unhappy events, last year happy events, and last year unhappy events. Recall was measured based on the total number of events recalled during the timed period. Fujita et al. believed that the greater the emotional intensity associated with each event, the greater the number of events would be recalled. Fujita et al. found that the mean number of both positive and negative events was significantly higher

for women than for men. Based on the results of the affect intensity and hedonic level measures, they concluded that women experience events more strongly than men do. Again, consistent with a considerable amount of research conducted in this area, Fujita et al. did not look at gender differences in the recall of relational events. They examined emotional, personal events. In the current study, the events under examination are relational events and are assessed within couples.

Gender Differences in Memory for Relational Events

To a limited extent, gender differences have been examined with regard to relationship memories. Ross and Holmberg (1992) examined the cause of gender differences in recall of relational events. In their study, they compared couples' recall of events from their relationship so that they could compare recall for the same events rather than unrelated events, as had been done in other research on this topic. The researchers suggested that men and women are socialized to assume different roles within their close relationships. Traditionally, men are responsible for providing both economic and physical security for their family. Women are socialized to be more concerned with interpersonal relationships. That is, as a way to counterbalance the inequity in power between men and women in relationships, women pay more attention to their husband's behaviors and feelings. They suggest that women may be "relationship experts." As a result, they attend to relational events as they occur more closely, think about it more afterwards, and therefore, encode these events in greater detail and also store more vivid memories of these events.

In their study, each couple had to recall one positive and one negative event that occurred in their relationship. Couples recalled these events in one of two conditions. Half of the participants recalled the events separately, and the other half jointly. The events' descriptions were rated in terms of vividness. In addition, in the joint condition the observers recorded how

many times the participants reported forgetting what happened. Men reported forgetting more frequently than did women. In addition, each couple indicated who they believed would have superior memory recall in their relationship. Both the men and the women rated the females as having superior recall. Because males reported more forgetting and also rated the females higher on recall, the researchers concluded that females' memories for relational events are more vivid. In sum, this research suggests that cultural-mediated gender roles, which lead females to be more relationally oriented, results in their ability to recall such events better. However, definite support for this explanation requires a measure of relational orientation rather than just participant's gender. For example, if this occurrence is strictly social, then females that score low on relational orientation should show corresponding deficits in recall. Also, similar to findings from studies examining gender differences in emotional recall, this greater recall should be due to greater detail in encoding, but this was not directly measured in their study.

Another theory that may help to explain gender differences in relational memory is the role of transactive memory in relationships (Wenger, Erber, & Raymond, 1991). Transactive memory "refers to a system whereby one person relies on the other to remember certain kinds of information" (Wright, 1998, p. 227). As relationships mature, the role of transactive memory increases. In a transactive memory system, Wenger et al. (1991) proposed that each partner remembers certain kinds of information. Wenger et al. tested this theory by giving naturally occurring couples and non-naturally occurring couples a joint memory task. It was hypothesized that the naturally occurring couples would do poorly on the memory task because it interfered with their current transactive memory system. The results were consistent with this hypothesis (Wenger et al., 1991). Further, it has been proposed that in most couples' transactive memory systems, it is the female's role to remember relationship events (Wenger et al., 1991). Thus,

females' recall of relational events will be greater than males, because females are more responsible for remembering these events. Males usually simply rely on their partner for the information. Moreover, if transactive memory is a factor in gender differences in relational memory, than the degree to which females show superiority in recall of these events should increase with the length of the relationship. Currently, no research has directly assessed this question. By including a measure of length of relationship in the current study, this possible moderator of gender differences in memory for relational events can be explored.

In the current study, it is proposed that consistent with previous research (Ross & Holmberg, 1992; Wenger et al., 1991; Wright, 1998), females will have a greater recall for relational events. Based on the current understanding of general mental processes involved in episodic and/or autobiographical memory, it can be inferred that when females process relational events, they encode the events in greater detail than males through their use of elaborative rehearsal techniques and also possibly imagery. Greater depth of processing leads to an increased number of pathways to the information. In addition, the information for each event is organized more efficiently into related categories, thus making relational events easier to recall.

Memory Biases in Relational Memory

Up to now, memory has been viewed as unintentionally imperfect. However, Karney and Combs (2000) proposed that relationship memories can be biased based on the couple's current relationship satisfaction. There are two theories associated with their proposal. The first is a theory of stability. This theory states that an individual will recall the past as similar to the present. Thus, if an individual is presently unhappy with their relationship, they will recall their past as being more negative than it actually was. The second theory, change or improvement, states that an individual will recall their past dissimilar to the present in such a way that the

present appears to be an improvement from the past. To test these theories, Karney and Coombs (2000) assessed the relationship satisfaction of a sample of wives at two 10-year intervals, first assessing satisfaction at the beginning of the first 10-year interval, again at the end of the first 10-year interval, and finally at the 20-year interval. The wives also recalled their relationship satisfaction at the previous interviews. The researchers found that at the first 10-year interval, participant's results were consistent with the improvement theory. That is, they recalled the present as being an improvement compared to the past. However, at the 20-year interval, the participant's results were consistent with the stability bias. They perceived their past the same as how they perceived their relationship in the present. Taken together, these results demonstrate that the affective tone and types of detail recalled of past relational events may be biased by the individual's current relationship satisfaction.

Gottman and Silver (1999) also examined the effect of relationship satisfaction on memories for relational events. They found that happy couples tend to remember their past as being happy. They remember the highlights of their relationship rather than the negative aspects. On the other hand, if a couple is not satisfied with their relationship and heading towards divorce, relationship memories are rewritten, such that couples will remember their past as more negative than it actually was. They also will only remember the negative aspects of each event rather than the positive aspects. For example, Gottman counseled a couple who was not happy with their marriage. When he asked the couple to recall their wedding day, rather than recalling the positive aspects of the wedding, they focused on the negative aspects. For example, the female recalled how her husband was flirting with the bridesmaids during their wedding (Gottman & Silver, 1999).

Another area of bias to note is the effect of relationship scripts on memory. Holmberg and Veroff (1996) proposed that when an individual cannot remember an event exactly as it happened, he or she would fill in the blanks with information that is consistent with a script of how they believe the event should have occurred. These researchers examined the effects of relationship scripts on reconstructing memories based on an individual's culture. Holmberg and Veroff hypothesized that when retelling the story of their courtship and marriage, individuals will emphasize the events that were consistent with their culture courtship script, and overlook inconsistent events. To test this, Holmberg and Veroff interviewed newlyweds over a two-year period. The participants told the story of their relationship from the beginning to the present. The researchers first interviewed them four to seven months after they were married and then again after two years. Holmberg and Veroff found that at the two-year period, the couple's stories of their relationships did move more closely to the normative relationship script for their culture. For example, both males and females de-emphasized the female's involvement in the courtship process at the second interview even though it was not consistent with how the event actually took place.

These theories on memory biases in relational memories, as a function of relationship satisfaction, are important for the current study because such biases have not been accounted for in previous research on gender differences in emotional or relational memory. If these memory biases exist, then participants will recall events consistent with their current relationship satisfaction. For example, if the female in the relationship reports significantly lower satisfaction than the male, she may recall the event more negatively and with greater negative emotion than will the male. This bias will thereby reduce her accuracy and thus moderate gender differences.

Current Study

Although gender differences in memory for emotional and relational events are well established, the reason for these differences is less clear. Canli et al. (2002) proposed that females have superior recall for emotional events as compared to men because they experience events more affectively, and they also use a more elaborative style of encoding and rehearsal to store events into memory. They found gender differences in the activation of the amygdala during encoding, which led them to believe females have enhanced brain processes during affective events and while encoding these events into memory. Seidlitz and Diener (1998) hypothesized that three factors contribute to females' superior memory recall: mood intensity at time of retrieval; rehearsal; and detail of encoding. In their studies they found that this superior recall was not due to rehearsal or mood intensity at time of recall. They did, however, find some support for their hypothesis that females did encode the events in greater detail than males.

Skowronski and Thompson (1990) believed that females have superior recall for personal events due to the fact that they are more concerned with recording important dates than males are, leading to the development of a temporal reference schema which facilitates remembering these events. Their results were consistent with their hypothesis. Fujita et al. (1991) proposed that women experience personal events with more emotion than men, which leads to more accurate retrieval of these events. They found that the mean number of both positive and negative events recalled by females was greater than that of males and that females experienced personal events more strongly than did males. Hence, taken together, research on gender differences in emotional events and personal events suggest that females experience greater affect intensity and encode these events in greater detail. Yet, no study specifically tested gender differences in detail in encoding of relational events in couples.

Ross and Holmberg (1992) proposed that observed gender differences in memory for relational events is due to the fact that women devote more time to relational interactions, by encoding these events in greater detail, and storing more vivid memories of these events. They concluded that women might be “relationship experts” as a result of culturally mediated gender differences in social and power roles. Other research on memory biases found that memories for relationships can be biased by couples’ current relationship satisfaction. Karney and Coombs (2000) proposed that this happens for two reasons: (1) individuals perceive their past as more negative than the present because they want the present to appear more positive; and, (2) if a couple is unhappy, they will perceive their past as more negative than it actually was to make it fit with their current view of their relationship. Gottman and Silver (1999) also examined the effect of relationship satisfaction on memories for relational events. These researchers found that happy couples tend to remember their past as being happy. On the other hand, if a couple is not satisfied with their relationship, they will remember their past as more negative.

My goal for this study was to determine why women have a higher rate of memory recall for negative and positive relational events as compared to men. I hypothesized that females have superior relationship schemata, and thus encode relational events in greater detail. A second goal was to broaden the research conducted in this area by combining both emotional and relational events, and thereby addressing some of the limitations I found in previous research. Specifically, by using couples, I was able to compare the details of the same relational event; Ross and Holmberg (1990) were the only other researchers to do so. This is important because, by comparing the same events, variance due to the type of event recalled will be eliminated, and therefore, I will get a more accurate gender comparison. Also, by asking couples to test individual versus socially shared events, I will assess whether gender differences in memory are

just for relational events or if they are also for non-relational, personal events. If there are no gender differences in the recall of individual events, than the hypothesis that females' better recall is due to a superior schema for relationships, will be supported. Also, by using the ARI and the BSRI, I will be able to determine the participant's relational orientation. If the reason for gender differences in memory recall is due to a greater relational orientation in females, than I would expect (1) females to score higher on these measures and (2) these scores to be correlated to detail of recall for both males and females. Taken together, the tests of these predictions should definitively indicate whether greater ability to encode relational events due to emotional intensity and relational orientation, underlie the gender differences in recall that have been found. I am also interested in whether the gender differences found in previous research are as robust in the current study. The majority of the previous research is more than a decade old, so as males become more involved in family life, these differences, if they are due to female's "relational expertise," might dissipate due to this societal shift. Finally, I measured each couple's relationship satisfaction to account for the biases that may be present in the recalled events due to each couple's relationship satisfaction. This was not accounted for in the previous research conducted on this topic.

Method

Participants

The participants in this study included 24 male/female couples ages 20-61, with a mean age of 33.23, and a $SD = 10.97$. I recruited the couples from Berks County, however, one of the partners in some couples lived in other counties in Pennsylvania. All participants had been in an exclusive relationship for a minimum of 24 mos. The length of the relationships ranged between

24-351 mos, with a mean length of 120.25 mos, $SD = 105.35$. Of the 24 couples, 14 were married, 3 were engaged, and 7 were dating.

The study was advertised on Albright College's campus via email and the *Lion Lowdown*, Albright's campus bulletin. I recruited additional participants through advertisements at local businesses in Berks County. At the end of the study, a raffle for gift certificates to local restaurants was conducted as an incentive to participate. In addition, the student participants entered into a raffle at Albright College to win cash prizes.

Materials

The materials used were the Autonomy and Relatedness Inventory (ARI; Schaefer & Edgerton, 1982) to assess relational orientation, and the Bem Sex Role Inventory (BSRI) to assess gender roles. These instruments can be found in Appendix A and B respectively. These scales were used to determine if culturally-influenced schemata for personal relationships influences recall (Swap & Rubin, 1983). The ARI measures several aspects of a relationship between two individuals on a 30-item, 5-point Likert scale (Schaefer & Edgerton, 1982). The scales measured by the ARI include: autonomy, relatedness, acceptance, support, listening, control, detachment/rejection, and hostile control. In addition, two larger scales can be derived from the measure through factor loading: autonomy versus hostile control, and relatedness versus detachment/rejection. The median internal consistency reliability of the ARI is .77. The validity of the ARI is supported by strong correlations with the Ladder and Spanier Scales of Marital Adjustment. Both the reliability and validity of the ARI support its use with intimate dyadic relationships (Schaefer & Edgerton, 1982). The BSRI measures an individual's femininity and masculinity levels. It is based on a 60-item, 7-point Likert scale. Both the masculinity score and the femininity score consist of an equal number of variables. For example,

one variable that contributed to the masculinity score was *self-reliant* and one variable that contributed to the femininity score was *understanding*. The participants also received Sternberg's Triangular Theory of Love Inventory (Sternberg, 1987; see Appendix C) and a relationship satisfaction survey (see Appendix D) to determine if the current state of their relationship biased their responses. Sternberg's Triangular Theory of Love is comprised of 45-item, 7-point Likert scale. It consisted of three subscales: intimacy, passion, and decision/commitment. When each of these subscales are combined in different ways, they produce eight different types of love: non-love, liking, infatuated love, empty love, romantic love, companionate love, fatuous love, and consummate love (Wright, 1999). The participants also completed a demographics survey measuring gender, age, length of relationship, and relationship status. In addition, recollected events, both social and nonsocial, were used. Scrap paper and story sheets with detailed instructions also were supplied to the participants to write down their responses. In addition to the other materials, the participants that completed the study through the mail had detailed written instructions to complete the study and a written debriefing.

Procedure

There were two methods used to conduct the study. The first method was in person, and the second was through the mail. A total of five couples completed the study in person, and 19 completed it through the mail. In each method, the participants first read and signed an informed consent form. They then chose one positive and one negative event with their partner to recall and describe and then each partner went to a separate room. Each partner then described each event using the provided story sheets. In addition, they recalled one individual event that they did not experience with their partner. The directions listed on the story sheets were as follows:

For positive event:

Please describe the positive event that you previously chose with your partner. Make sure that you write the name of the event and describe the event, from beginning to end. Please include your feelings, thoughts, and behaviors during the event.

For negative event:

Please describe the negative event that you previously chose with your partner. Make sure that you write the name of the event and describe the event, from beginning to end. Please include your feelings, thoughts, and behaviors during the event.

For individual event:

Please describe any event that you experienced by yourself without your partner or anyone else that you know. For example, the last time you went to the dentist or the last time you went to the grocery store (alone). Make sure that you write the name of the event and describe the event, from beginning to end. Please include your feelings, thoughts, and behaviors during the event.

When finished, they completed a demographics survey, the BSRI, ARI, Sternberg's Inventory, and the relationship satisfaction survey. To counterbalance the independent variables, the story sheets were distributed in six different alternate orders across couples. They were positive, negative, neutral (non-social); positive, neutral, negative; negative, positive, neutral; negative, neutral, positive; neutral, positive, negative; and neutral, negative, positive. Once the participants completed the study, I debriefed them, answered questions, and thanked them for their participation.

Results

The scores on four questionnaires were included as independent variables, or covariates. The Bem Sex Role Inventory (BSRI) was based on a scale from 1-7, where 1 equals never or almost never true and 7 equals always or almost always true. The items on the BSRI were averaged together and yielded two scores, one for masculinity, $M = 4.9$, $SD = .67$, and one for femininity, $M = 4.72$, $SD = .93$. The Autonomy and Relatedness Scale (ARI) was based on scale from 1-5, where 1 equals not at all like him/her and 5 equals very much like him/her. The ARI yielded eight individual scales, five of which were positive and three of which were negative.

The positive scales included relatedness, $M = 4.03$, $SD = .75$, support, $M = 4.4$, $SD = .69$, listening, $M = 4.06$, $SD = .81$, acceptance, $M = 3.99$, $SD = .71$, and autonomy, $M = 4.12$, $SD = .60$. The negative scales included detachment/rejection, $M = 1.6$, $SD = .59$, hostile control, $M = 1.95$, $SD = .73$, and control, $M = 2.22$, $SD = .75$. In addition, the ARI also yielded two scales through factor loading. Factor one was relatedness versus detachment/rejection, $M = 4.17$, $SD = .60$, and factor two was autonomy versus control, $M = 4.04$, $SD = .5$. For factor loading, the negative scales were reverse scored. Sternberg's Triangular Theory of Love Scale was based on a scale from 1-9, where 1 equals not at all, and 9 equals extremely. Sternberg's Scale yielded three individual scales, which included intimacy, $M = 8.04$, $SD = .94$, passion, $M = 7.03$, $SD = 1.42$, and commitment, $M = 8.5$, $SD = .66$. The relationship satisfaction inventory, $M = 2.39$, $SD = .75$, was based on a scale from -3 to 3, where -3 equals not true at all, and three equals extremely true.

The dependent variable in this study was detail in encoding. This included a word count of the number of words used to describe the event, a word count of the number of positive words used to describe each event, and a word count of the number of negative words used to describe each event. Examples of positive words include: happy and exciting. Examples of negative words include: sad and terrible. To determine inter-rater consistency, a random sample of story sheets were scored by independent raters and later compared. Inter-rater consistency was determined to be very high.

Overall, for positive events, participants wrote a total of $M = 251.92$, $SD = 161.45$ words. For negative events participants wrote $M = 249.73$, $SD = 160.73$ words. For neutral event participants wrote $M = 156.40$, $SD = 103.56$ words. The participants used a significantly higher number of both positive and negative words overall to describe each event, than they did for the

neutral event. For emotion of neutral event $M = 2.4$, $SD = .78$ emotional words. For relation of neutral event $M = 1.49$, $SD = .506$. The mean total number of positive words that each participant used to describe the positive event was $M = 14.58$, $SD = 9.05$. The mean total number of negative words the participants used to describe the positive event was $M = 4.38$, $SD = 4.23$. The mean total number of negative words the participants used to describe the negative event was $M = 17.73$, $SD = 9.91$. The mean total number of positive words the participants used to describe the negative event was $M = 5.23$, $SD = 5.48$. The mean total of positive words that the participants used to describe neutral event was $M = 4.73$, $SD = 3.90$. The mean total for the number of negative words the participants used to describe the neutral event was $M = 6.56$, $SD = 5.53$.

To test the hypotheses, a 2 X 2 X 3 mixed factorial ANOVA was used, where gender (male vs. female) was the between subjects factor and type of word (positive vs. negative) and type of event (positive vs. negative vs. neutral) were the within subjects factors. The dependent variable was detail of recalled event as indicated by the number of words recalled. Each of the independent variables were tested at a .05 significance level. As seen in Table 1, a significant main effect for gender $F_{(1, 46)} = 13.65$, $p = .001$ was found. Females recalled the events in greater detail than did the males. A significant main effect was also found for event, $F_{(2, 92)} = 24.31$, $p = .001$. Both positive and negative relational events were described in more detail than the neutral events. Additionally, two-way interactions for gender and event, $F_{(2, 92)} = 3.65$, $p = .03$., and for emotion and event, $F_{(2, 92)} = 97.14$, $p = .001$ were found. These results are qualified by a significant three-way interaction between gender, word emotion, and event, $F_{(2, 92)} = 4.32$, $p = .016$ (see Figures 1 & 2). Simple effects analysis indicated that females used a significantly higher number of positive words to describe positive events, $M = 17.88$, $SD = 9.75$, than did the

males, $M = 11.29$, $SD = 7.05$, and a significantly higher number of negative words to describe negative events, $M = 21.79$, $SD = 10.88$, than did the males, $M = 13.67$, $SD = 6.90$. In addition, there was a marginal tendency for females to use a higher number of positive words to describe the negative events, $M = 6.71$, $SD = 6.22$, than the males, $M = 3.75$, $SD = 4.26$, and a higher number of negative words to describe positive events, $M = 5.50$, $SD = 5.15$, than did the males, $M = 3.25$, $SD = 7.41$. Females, however, did not use more positive, $M = 5.46$, $SD = 4.16$, or more negative words $M = 6.96$, $SD = 5.26$, to describe the neutral events, than did the males, $M = 4.00$, $SD = 3.55$ for positive, and $M = 6.17$, $SD = 5.88$ for negative. Thus, the results support the hypothesis that females are superior only at recalling relational events.

To test the differences in the total number of words used to describe each event, a 2 X 3 mixed factorial design was conducted, where gender (male vs. female) was the between-subjects factor, and event (positive vs. negative vs. neutral) was the within-subjects factor. The dependent variable was the total number of words used to describe each event. Tested at the .05 significance level, a significant main effect for gender was found $F_{(1, 46)} = 9.98$, $p = .003$. Females wrote more words than did males. In addition, a significant main effect for the total number of words used to describe each event was also found $F_{(2, 96)} = 12.94$, $p = .001$. The type of event being described had an effect on the total number of words used to describe that event. There was also a marginally significant two-way interaction between gender and event $F_{(2, 96)} = 2.79$, $p = .067$ (see Figure 3). Simple effects analysis indicated that females described both positive, $M = 299.58$, $SD = 172.03$, and negative, $M = 323.33$, $SD = 184.60$, events in greater detail than the males, $M = 204.25$, $SD = 137.60$ for positive, and $M = 176.13$, $SD = 86.07$ for negative, but both females, $M = 179.38$, $SD = 111.26$, and males, $M = 133.42$, $SD = 91.84$, described the neutral events with the same amount of detail.

Correlations were also computed to determine the effects of relational orientation and relationship satisfaction on detail of encoding. To test the effects of relational orientation, all of the dependent variables were correlated with the scales on the ARI and the BSRI. Tested at a .05 significance level, a significant negative correlation was found between hostile control and word total for positive event, $r_{(46)} = -.311, p = .031$. Hostile control was also negatively correlated with the total number of negative words used to describe each positive event, $r_{(46)} = -.374, p = .009$ and negatively correlated with word total for neutral event, $r_{(46)} = -.283, p = .051$. All three of these results indicate that the participants that scored higher on the hostile control scale wrote less overall in each of the three conditions. Tested at a .01 significance level, listening was negatively correlated with word total for negative event, $r_{(46)} = -.376, p = .004$. In addition, tested at the .05 significance level, the listening scale was also negatively correlated with the total number of negative words used to describe each positive event, $r_{(46)} = -.329, p = .011$, and also the total number of negative words used to describe each negative event, $r_{(46)} = -.256, p = .040$. These results indicate that the participants that scored lower on the listening scale wrote more words to describe the negative event, and also used more negative words to describe both the negative and positive events. The remaining measures of relational orientation were not significantly correlated.

To test the effects of relationship satisfaction, all of the dependent variables were correlated with the scales on Sternberg's Triangular Theory of Love Inventory and the relationship satisfaction inventory. The total score on Sternberg's Scale was negatively correlated with word total for negative event, $r_{(46)} = -.531, p = .001$. In addition, this score was also negatively correlated with total negative words for positive event, $r_{(46)} = -.490, p = .001$ and total negative words for negative event $r_{(46)} = -.464, p = .001$. The participants' relationship

satisfaction inversely effected the detail with which they described the negative event, and the total number of negative words they used to describe both the negative and positive events.

Discussion

Although the gender differences in both emotional and relational memory are well established, the reasons for these differences are less clear. The purpose of this study was to determine why women have a higher rate of memory recall for negative and positive relational events as compared to men. I hypothesized that females have superior relationship schemata, and thus encode relational events in greater detail. Twenty-four male/female couples participated in this study. Each couple described one positive and one negative event that occurred in their relationship in the past 2-5 years. In addition, they also had to recall one individual event that they did not experience with their partner. The participants also completed a demographics questionnaire, and several relational inventories to determine their relational orientation and their current relationship satisfaction.

When examining the effects of gender, emotion, and type of event on the number of positive and negative words used to describe each event, a main effect for gender and a main effect for event were found. The females in the study described the events in greater detail than did the males. In addition, the participants in the study described the positive and negative events in more detail than they did the neutral events. Additionally, a significant three-way interaction between gender, word emotion, and event on the total number of positive and negative words used to describe each event was found. Females used a significantly higher amount of positive words to describe positive events and a significantly higher number of negative words to describe negative events than did the males. In addition, there was a marginal tendency for females to use a higher number of positive words to describe the negative events,

and a higher number of negative words to describe positive events than the males. Females, however, did not use more positive or negative words to describe the neutral events. These results support the hypothesis that females encode relational but not non-relational events in greater detail than do males.

When examining the effects of gender and total number of words used to describe each event, a significant main effect for gender was found. The gender of the participant effected the total number of words used to describe each event. In addition, a significant main effect for the total number of words used to describe each event was also found. There was also a marginally significant two-way interaction between gender and event. Females described both positive and negative events in greater detail than the males, but both males and females described the neutral events with the same amount of detail.

The results of this study support the hypothesis that females encode relational events in greater detail. The females in this study described both the positive and negative events in greater detail than the males. In addition, they also used more affective words to describe these events. This indicates that the females encoded the affective events in greater detail due to the increased emotional intensity experienced at the time of each event. The females did not differ from males in detail when describing the neutral events, which also supports the theory that females' memory superiority is for relational events, not general non-relational events. This important comparative evidence is lacking in previous research. These results discount the idea that females simply write more than men in general, and also remember all autobiographical memories with more detail.

The results of this study are consistent with the previous research conducted on this topic. Researchers that tested non-relational events also found a difference in memory recall between

genders. Canli et al. (2002) found that females use a more elaborative style of encoding to store events into memory. This was evidenced by the gender differences in the activation of the amygdala during encoding, enhanced integration of brain processes associated with affective events, and the encoding of these events into memory. In addition, in one of the three studies they conducted, Seidlitz and Diener (1998) found that females did encode the events in greater detail than males. In all three studies, they found that females had a higher rate of recall for positive events and in studies 1 and 2, for negative events. Thus, it seems that females tend to recall all emotional autobiographical events in more detail than males, but this previous research did not distinguish whether the events recalled were relational or non-relational. As a result, these gender differences may be due to the fact that events recalled are primarily relational. This reasoning is supported by the current study's findings that such memories are more elaborate, affectively-laden and thus, are more likely to be retrieved when an individual is requested to recall personal, emotional memories.

Skowronski and Thompson (1990) argued that females have superior recall for personal events due to the fact that they are more concerned with recording important dates than are males, leading to the development of a temporal reference schema for these events. However, Skowronski and Thompson (1990) measured personal events, rather than relational events, and participants simply recalled the dates that these events occurred, not the actual event. Thus, detail of encoding was not assessed. In this instance, Fujita et al. (1991) measured gender differences in the recall of events by writing a description of these events, similar to the method used in the current study. However, they also did not measure relational events. Ross and Holmberg (1992) did ask males and females to recall relational events, however, they did not

measure detail of encoding. Thus, the current study makes an important step forward by focusing on shared relational events and assessing the detail of encoding of these events.

In addition to focusing specifically on relational events shared by a couple and testing whether there were differences in detail of encoding, the current study sought to explore if this difference in encoding detail is due to gender differences in relational orientation, as previous researchers have argued (Ross & Holmberg, 1992). Specifically, Ross and Holmberg (1992) proposed that females devote more time to relational interactions, and therefore encode these events in greater detail and also store more vivid memories of these events than do men. It was hypothesized that participants that scored high on relational orientation would describe each event with greater detail. This hypothesis was partially supported by these results. Correlations were performed to determine the effects of relational orientation on detail of encoding. When testing for relational orientation, significant correlations were found for hostile control and listening, however, the major scales of the ARI, autonomy and relatedness, were not significant. The hostile control scale measures how hostile the individual completing the scale feels their partner treats them. Similarly, the listening scale measures how well the participant perceives their partner listens to them. A significant negative correlation was found between hostile control and word total for positive event. The participants that scored higher on the hostile control scale used a significantly lower number of words to describe each positive event. In addition, a significant negative correlation was found between the listening scale on the ARI and the total number negative words recalled, in addition to the total number of negative words used to describe both the positive and negative events. The participants that scored their partner low on the listening scale, wrote more negatively about their relationship, and those that scored high,

wrote less negatively about their relationship. The scales on the BSRI were not found to be significantly correlated with detail in encoding.

Relationship satisfaction was also explored as a possible explanation for gender differences in relational memory. It was hypothesized that individuals will describe their past as consistent with their current relationship satisfaction. When testing for relationship satisfaction, several correlations were found. The total score on Sternberg's Scale was negatively correlated with word total for negative event. The participants that scored high on Sternberg's Scale used a lower number of words to describe their negative events. In addition, this score was also negatively correlated with total negative words for positive event and total negative words for negative event. The participants that reported a lower relationship satisfaction used more negative words to describe each positive event and more negative words to describe each negative event. The participants that reported higher relationship satisfaction used less negative words to describe both positive and negative events. Although the participants that reported high relationship satisfaction did not describe each event with a greater number of positive words, this suggests that rather than recalling their past as more positive, they recall their past with greater accuracy, focusing on the facts of each event rather than the negative or positive aspects of each event.

Gottman and Silver (1999) examined the effect of relationship satisfaction on memories for relational events. Consistent with the results in this study, they found that if a couple is not satisfied with their relationship, they will remember their past as more negative than it actually occurred and will also only remember the negative aspects of each event rather than the positive aspects. They also found that happy couples tend to remember their past as being happy.

Karney and Coombs (2000) proposed that this happens for two reasons: (1) individuals perceive

their past as more negative than the present because they want the present to appear more positive (2) if a couple is unhappy or vice versa, they will perceive their past as more negative than it actually was. A measurement of relationship satisfaction was important to include in the current study because previous research has not explored this issue when examining gender differences in relational memory. It is also clearly an important moderator of the gender differences in such memories.

Although significant results for this study were found, there are several limitations to note. First, although participants may have remembered more about each event that they were describing, they may have not written it down due to the fatigue from writing, lack of motivation, or distraction. In the current study, this effect was controlled for by counterbalancing the story sheets, however, in the future, to yield more precise results, an alternative method of measuring detail may be used. For example, participants could describe each event verbally rather than writing down their responses. Second, a simple word count of the total number of positive and negative words was used to determine if each event was recalled with more emotional detail. This word count did not account for the differences between facts and actual emotions. For example, although the word "cancer" is a negative fact and "sad" is a negative emotion, they both contributed equally to the total number of emotional words in the event. Third, the main distribution method of this study was through the mail. Although, the participants were given detailed written instructions in addition to detailed story sheets for each event, there were several instances where it appears that they did not follow the directions. For example, three participants did not describe an individual event that they did not experience with their partner. Fourth, since the previous research indicated that mood at time of retrieval did not effect memory recall, this was not measured in the current study. However, a few participants

did mention that they probably would have written more if they were in a better mood. Fifth, when the participants were asked to recall non-relational events, it was not indicated whether or not they were to recall emotional events. As a result, the emotional intensity of the non-relational events varied across individuals. An additional limitation to this study is the way that relational orientation was measured. Despite previous research that suggests that relational orientation underlie the gender differences in encoding detail, the measures did not correlate with detail in encoding. For instance, the ARI does not directly measure individual orientation. It measures the relational orientation between two individuals in a relationship. In addition, the BSRI measures masculine and feminine tendencies rather than relational orientation. Although feminism may be an indicator of relational orientation, they are independent constructs. In addition, the participants may not have accurately completed the BSRI due to social desirability. A last limitation is that it is extremely difficult to accurately measure detail in encoding, because encoding is a mental process that cannot be directly measured. Several attempts have been made including tape recording and writing to measure detail in encoding. In addition, Canli et al. (2002) measured encoding by conducting an fMRI while participants completed a recall task. Multiple methods used to measure detail in encoding simultaneously might yield clearer results.

In conducting further research on this topic, as suggested before, participants should be asked to give verbal responses rather than written responses to eliminate fatigue from writing. This should yield a more precise measure of detail in encoding. In addition, a word count of both affective facts and emotions should be counted separately rather than together to determine a more accurate measure of detail in encoding. It is also encouraged that participants are tested in person rather than through the mail. This will ensure that the participants both understand and follow the directions more completely. An additional suggestion for future research includes

adding a measure of mood at time of recall and a retrospective measure at time of encoding. Additional testing could potentially show that mood is in fact a factor in recall and should be examined further. In addition, more accurate means of measuring relational orientation should be obtained. Finally, a more precise measure detail in encoding should be obtained. A possibility is to combine recall of relational events with measurements of an fMRI, to see if the brain processes involved in encoding are correlated to the detail in which the events were recalled.

The results of the current study support previous research, as well as the hypothesis that females encode relational events in greater detail than males. It can be inferred that when encoding relational events, females use a more conscious and elaborative technique to encode the information than the males, which allows them to form a greater number of pathways to these events and also organize this information more efficiently into the category for relational events so that it is easier for them to recall these events. Also explored were the effects of relational orientation and relationship satisfaction on detail of encoding. While relationship satisfaction was found to influence encoding, only certain aspects of relational orientation were found to be a factor, a finding that needs to be addressed in future research. In conclusion, the results of this study suggest that there are several factors that contribute to gender differences in relational memory. Additional research will help to clarify each factor and how they contribute to these gender differences.

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Table 1

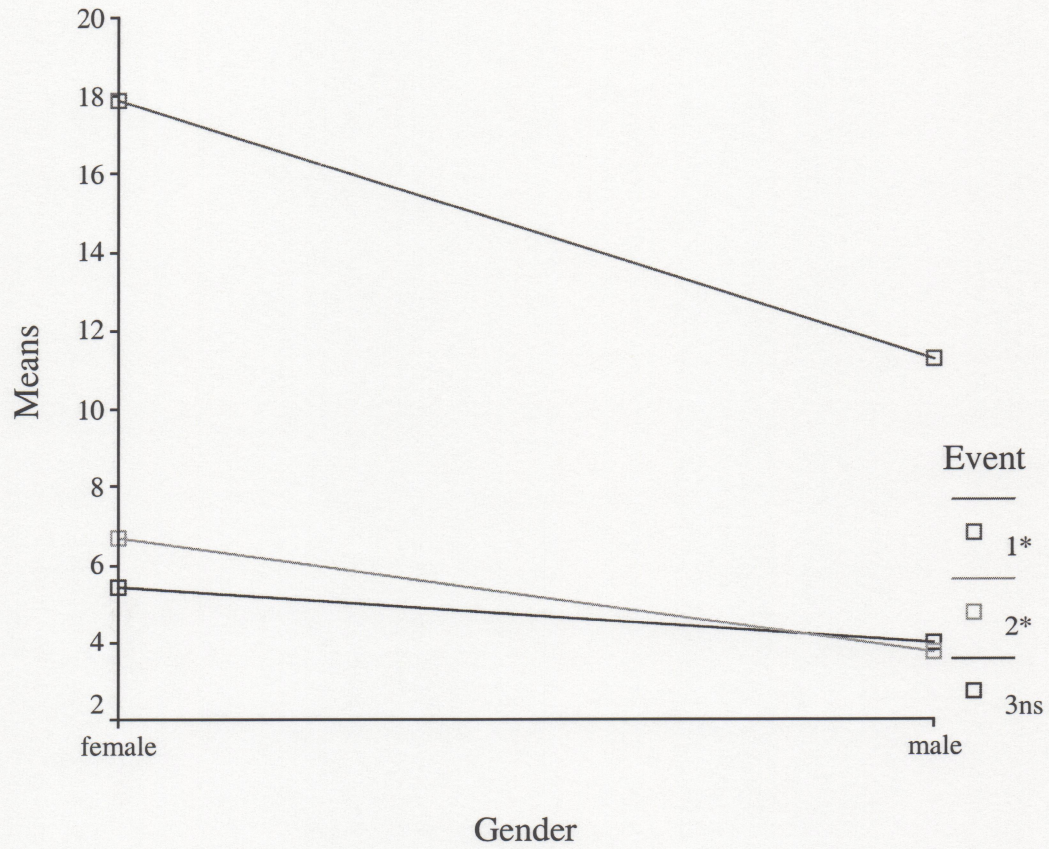
2 X 2 X 3 Analysis of Variance for Memory Recall

Source	<i>df</i>	<i>F</i>	<i>p</i>
Between subjects			
Gender (G)	1	13.65	.001*
Error	46		
Within subjects			
Emotion (EM)	2	3.27	.077
Event (EV)	2	24.31	.001*
EM x G	2	0.01	.971
EV x G	2	3.65	.030*
EM x EV	2	97.14	.001*
EM x EV x G	2	4.32	.016*
Error	92		

Note. * $p \leq .05$.

Figure 1

Significant Three Way Interaction between Gender, Emotion, and Event for Positive Word

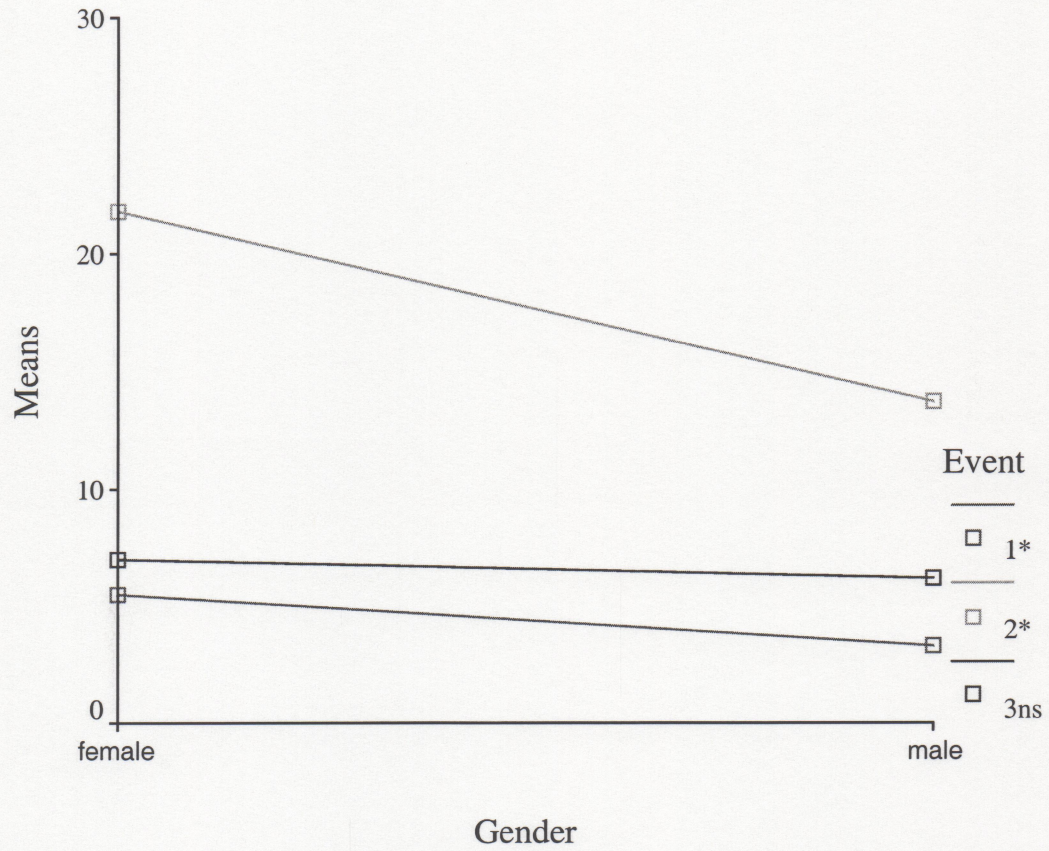


Note. * $p \leq .05$.; ns = not significant.

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Figure 2

Significant Three Way Interaction between Gender, Emotion, and Event for Negative Word

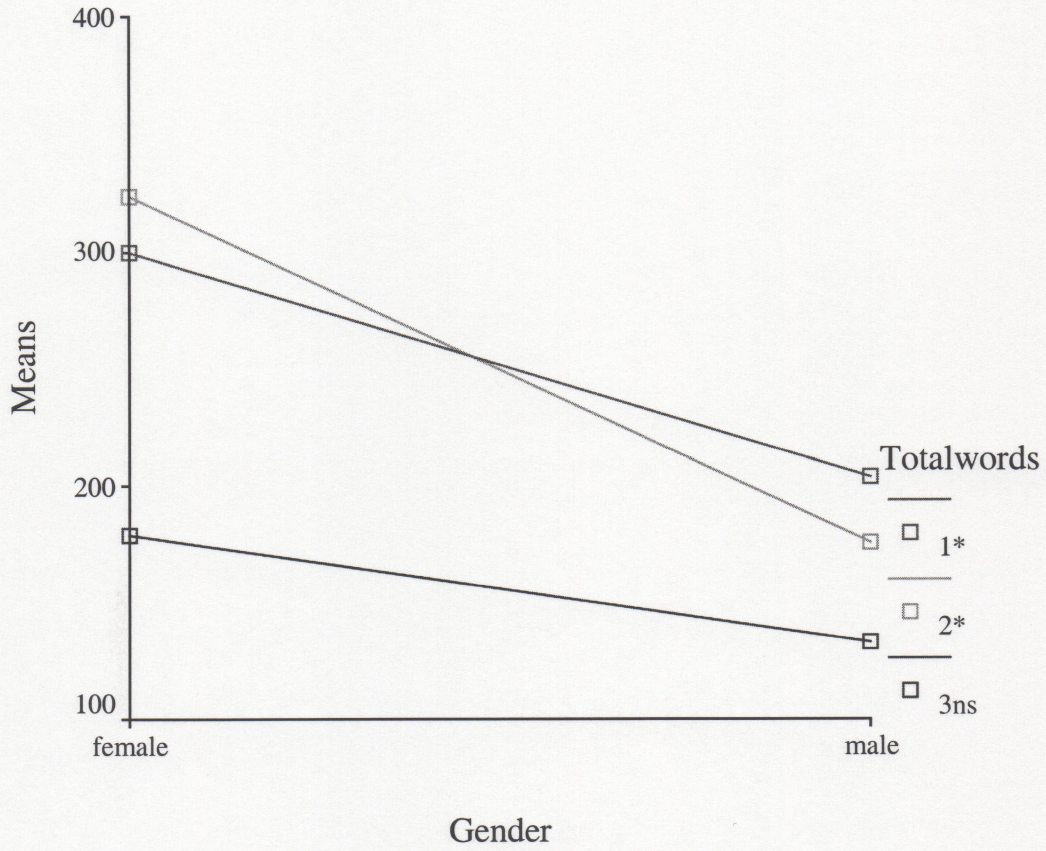


Note. * $p \leq .05$.; ns = not significant.

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Figure 3

Significant Two Way Interaction between Gender and Word Total



Note. * $p \leq .05$.; ns = not significant

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Appendix A

The Autonomy and Relatedness Scale

ARI

Here are some statements that might describe your partner. Please tell me how well each statement describes him/her by telling me if it is (1) **not at all like**, (2) **very little like**, (3) **somewhat like**, (4) **much like**, or (5) **very much like him/her**. (Please circle only one number).

1. Talks over his/her problems with me.	1	2	3	4	5
2. Is always trying to change me.	1	2	3	4	5
3. Respects my opinions.	1	2	3	4	5
4. Acts as though I'm in the way.	1	2	3	4	5
5. Is there when I need him/her.	1	2	3	4	5
6. Won't take no for an answer when he/she wants something.	1	2	3	4	5
7. Tries to understand how I see things.	1	2	3	4	5
8. Gives me as much freedom as I want.	1	2	3	4	5
9. Is always thinking of things that would please me.	1	2	3	4	5
10. Argues back no matter what.	1	2	3	4	5
11. Encourages me to follow my own interests.	1	2	3	4	5
12. Makes fun of me.	1	2	3	4	5
13. Is very willing to help when I need it.	1	2	3	4	5
14. Wants to have the last word on how we spend our time.	1	2	3	4	5
15. Thinks I'm worth listening to.	1	2	3	4	5
16. Lets me make up my own mind.	1	2	3	4	5
17. Has a good time with me.	1	2	3	4	5
18. Wants to control everything I do.	1	2	3	4	5
19. Is happy to go along with my decisions.	1	2	3	4	5
20. Says I'm a big problem.	1	2	3	4	5

Here are some statements that might describe your partner. Please tell me how well each statement describes him/her by telling me if it is (1) **not at all like**, (2) **very little like**, (3) **somewhat like**, (4) **much like**, or (5) **very much like him/her**. (Please circle only one number).

21. Does what he/she can to make things easier for me.	1	2	3	4	5
22. Expects me to do everything his/her way.	1	2	3	4	5
23. Makes me feel I can tell him/her anything.	1	2	3	4	5
24. Thinks it's okay if I disagree with him/her.	1	2	3	4	5
25. Asks me to share things he/she enjoys.	1	2	3	4	5
26. Finds faults with me.	1	2	3	4	5
27. Considers my point of view.	1	2	3	4	5
28. Doesn't think about me very much.	1	2	3	4	5
29. Tries to comfort me when things go wrong.	1	2	3	4	5
30. Acts as if he/she doesn't know me when he/she's angry.	1	2	3	4	5

Appendix B

The Bem Sex Role Inventory

Instructions: Indicate on a scale of 1-7 how well each of the following characteristics describes you using the following scale: (1) never or almost never true; (2) usually not true; (3) sometimes but infrequently true; (4) occasionally true; (5) often true; (6) usually true; (7) always or almost always true.

- | | | |
|----------------------------|--------------------------------|---------------------------------|
| ___ 1. self-reliant | ___ 23. sympathetic | ___ 41. warm |
| ___ 2. yielding | ___ 24. jealous | ___ 42. solemn |
| ___ 3. helpful | ___ 25. has leadership | ___ 43. willing to take a stand |
| ___ 4. defends own beliefs | abilities | ___ 44. tender |
| ___ 5. cheerful | ___ 26. sensitive to the needs | ___ 45. friendly |
| ___ 6. moody | of others | ___ 46. aggressive |
| ___ 7. independent | ___ 27. truthful | ___ 47. gullible |
| ___ 8. shy | ___ 28. willing to take risks | ___ 48. inefficient |
| ___ 9. conscientious | ___ 29. understanding | ___ 49. acts as a leader |
| ___ 10. athletic | ___ 30. secretive | ___ 50. childlike |
| ___ 11. affectionate | ___ 31. makes decisions | ___ 51. adaptable |
| ___ 12. theatrical | easily | ___ 52. individualistic |
| ___ 13. assertive | ___ 32. compassionate | ___ 53. does not use harsh |
| ___ 14. flattering | ___ 33. sincere | language |
| ___ 15. happy | ___ 34. self-sufficient | ___ 54. unsystematic |
| ___ 16. strong personality | ___ 35. eager to soothe hurt | ___ 55. competitive |
| ___ 17. loyal | feelings | ___ 56. loves children |
| ___ 18. unpredictable | ___ 36. conceited | ___ 57. tactful |
| ___ 19. forceful | ___ 37. dominant | ___ 58. ambitious |
| ___ 20. feminine | ___ 38. soft spoken | ___ 59. gentle |
| ___ 21. reliable | ___ 39. likable | ___ 60. conventional |
| ___ 22. analytical | ___ 40. masculine | |

Appendix C

*Sternberg's Triangular Theory of Love Scale***INSTRUCTIONS**

Rate each statement on a 1-to-9 scale, where 1 = "not at all", 5 = "moderately", and 9 = "extremely." Use intermediate points on the scale to indicate intermediate levels of feelings.

- _____ 1. I am actively supportive of my partner's well-being.
- _____ 2. I have a warm relationship with my partner.
- _____ 3. I am able to count on my partner in times of need.
- _____ 4. My partner is able to count on me in times of need.
- _____ 5. I am willing to share myself and my possessions with my partner.
- _____ 6. I receive considerable emotional support to my partner.
- _____ 7. I give considerable support to my partner.
- _____ 8. I communicate well with my partner.
- _____ 9. I value my partner greatly in my life.
- _____ 10. I feel close to my partner.
- _____ 11. I have a comfortable relationship with my partner.
- _____ 12. I feel that I really understand my partner.
- _____ 13. I feel that my partner really understands me.
- _____ 14. I feel that I really can trust my partner.
- _____ 15. I share deeply personal information about myself with my partner.
- _____ 16. Just seeing my partner excites me.
- _____ 17. I find myself thinking about my partner frequently during the day.
- _____ 18. My relationship with my partner is very romantic.
- _____ 19. I find myself to be very personally attractive.
- _____ 20. I idealize my partner.
- _____ 21. I cannot imagine another person making me as happy as my partner does.
- _____ 22. I would rather be with my partner than with anyone else.
- _____ 23. There is nothing more important to me than my relationship with my partner.

Rate each statement on a 1-to-9 scale, where 1 = "not at all", 5 = "moderately", and 9 = "extremely." Use intermediate points on the scale to indicate intermediate levels of feelings.

- _____ 24. I especially like physical contact with my partner.
- _____ 25. There is something almost "magical" about my relationship with my partner.
- _____ 26. I adore my partner.
- _____ 27. I cannot imagine life without my partner.
- _____ 28. My relationship with my partner is passionate.
- _____ 29. When I see romantic movies and read romantic books I think of my partner.
- _____ 30. I fantasize about my partner.
- _____ 31. I know that I care about my partner.
- _____ 32. I am committed to maintaining my relationship with my partner.
- _____ 33. Because of my commitment to my partner, I would not let other people come between us.
- _____ 34. I have confidence in the stability of my relationship with my partner.
- _____ 35. I could not let anything get in the way of my commitment to my partner.
- _____ 36. I expect my love for my partner to last the rest of my life.
- _____ 37. I will always feel a strong responsibility for my partner.
- _____ 38. I view my commitment to my partner as a solid one.
- _____ 39. I cannot imagine ending my relationship with my partner.
- _____ 40. I am certain of my love for my partner.
- _____ 41. I view my relationship with my partner as permanent.
- _____ 42. I view my relationship with my partner as a good decision.
- _____ 43. I feel a sense of responsibility towards my partner.
- _____ 44. I plan to continue in my relationship with my partner.
- _____ 45. Even when my partner is hard to deal with, I remain committed to our relationship.

Appendix D

Relationship Satisfaction Inventory

Following are more general statements about your relationship with your partner. Please indicate your response by circling the number that best represents the extent to which each statement is or was true or your relationship with your partner.

- | | | | | | | | | | |
|-----|--|----|----|----|---|---|---|---|----------------|
| 1. | I give considerable emotional support to my partner. | | | | | | | | |
| | Not True At All | -3 | -2 | -1 | 0 | 1 | 2 | 3 | Extremely True |
| 2. | Our relationship is rewarding. | | | | | | | | |
| | Not True At All | -3 | -2 | -1 | 0 | 1 | 2 | 3 | Extremely True |
| 3. | I am satisfied with this relationship. | | | | | | | | |
| | Not True At All | -3 | -2 | -1 | 0 | 1 | 2 | 3 | Extremely True |
| 4. | I have a relationship of mutual understanding with my partner. | | | | | | | | |
| | Not True At All | -3 | -2 | -1 | 0 | 1 | 2 | 3 | Extremely True |
| 5. | I receive considerable emotional support from my partner. | | | | | | | | |
| | Not True At All | -3 | -2 | -1 | 0 | 1 | 2 | 3 | Extremely True |
| 6. | This relationship is important to me. | | | | | | | | |
| | Not True At All | -3 | -2 | -1 | 0 | 1 | 2 | 3 | Extremely True |
| 7. | I am able to count on my partner in times of need. | | | | | | | | |
| | Not True At All | -3 | -2 | -1 | 0 | 1 | 2 | 3 | Extremely True |
| 8. | My partner is able to count on me in times of need. | | | | | | | | |
| | Not True At All | -3 | -2 | -1 | 0 | 1 | 2 | 3 | Extremely True |
| 9. | I am happy with this relationship. | | | | | | | | |
| | Not True At All | -3 | -2 | -1 | 0 | 1 | 2 | 3 | Extremely True |
| 10. | I feel emotionally close to my partner. | | | | | | | | |
| | Not True At All | -3 | -2 | -1 | 0 | 1 | 2 | 3 | Extremely True |