

Gender Differences Associated With Memory Recall

By  
Lee Morgan Gunn

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Approved by

\_\_\_\_\_  
Advisor: Dr. Matthew Reysen

\_\_\_\_\_  
Reader: Dr. Michael Allen

\_\_\_\_\_  
Reader: Dr. John Samonds

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## Abstract

Lee Morgan Gunn: Gender Differences Associated With Memory Recall  
(Under the direction of Dr. Matthew Reysen)

This study investigated whether a gender difference existed in the context of romantic relationships. Participants rated positively valenced words and negatively valenced words, that were related to a romantic relationship, on how relevant they were to realistic romantic relationships. Participants were then given a free recall task to recall any words that they rated earlier. The study found that a gender difference did exist in the context of negatively valenced words. Women were more successful in recall of negatively valenced words than men. These findings indicate that women encode emotional information differently than men encode emotional information and recall that information more easily than male participants.

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## Gender Differences Associated With Memory Recall

Over the years, a number of studies have focused on differences in the manner in which men and women remember information. In some of these articles, the specific motivation has been to determine whether gender differences exist for memory for emotional information. Although emotional information can come in many forms, one important and potentially fruitful area in which differential memory performance between men and women might be observed is in the realm of relationships. The primary purpose of the present study was to determine whether gender differences exist for memory for common nouns when those words are processed in the context of a realistic romantic relationship.

In one study related to this aim, Roots (2005) attempted to determine whether there were gender differences in the manner in which men and women process negative images. To accomplish this goal, she asked participants to look at a series of negative pictures. Then, after a 3-week interval, the participants were asked to remember as many of the pictures as possible that they had seen three weeks before. This memory portion of the experiment was conducted using an MRI to see if any differences in brain activity were related to the gender of the participant.

There were two primary results of the study. The first is that women remembered more of the negative images than men. In addition, the images seemed

to activate more brain regions in women than men. This suggests that women coded the images more effectively than men, and this difference was apparent in the differential memory performance between genders.

If it is true that women encode negatively valenced emotional information more deeply than men, one might expect women to remember more negatively valenced words than men in the context of a relationship. One purpose of the current experiment was to test that hypothesis.

Although Roots' (2005) study was restricted to only negatively valenced emotional information, other studies have investigated the effects of other types of emotional information on gender differences in memory performance. For example, Bloise and Johnson (2007) investigated the effects of emotional or neutral conversations on the ability of men and women to recall and recognize passages from a script that they were asked to read. In the study, both men and women were assigned to read statements that were either emotionally neutral or emotional. The neutral portion of the script involved subjects that focused on the task at hand while the more emotional passages involved interpersonal issues amongst the couple.

After reading either the emotional passage or the neutral passage, the participants were assigned to one of three conditions. In the first condition, participants were asked to come with ideas for improving communication for the interpersonal problems the couple was facing. In a neutral condition, participants

were asked to focus on the factual aspects of the problem at hand. Finally, in what the authors refer to as an 'undirected focus' condition, the participants were not given any direction about the advice that they were supposed to generate. After completing the first two phases of the experiment (reading the script and preparing the advice), the participants were asked to (1) recall as much information as they could from the conversation that was contained in the script and (2) complete a yes/no recognition test by identifying whether a particular statement was included in the earlier reading.

The results of the study indicated that overall, women tended to offer more emotional advice than men. In addition, women tended to recall more information (both emotional and neutral) than men. However, no gender differences were observed for recognition memory. Thus, consistent with Roots' (2005) study, Bloise and Johnson (2007) found that women's memories for emotional information are better than men's. In addition, it was also reported that women's memories for neutral information were better than men. It appears as though when information is presented in the context of a relationship (as was the case for all scenarios given in Bloise and Johnson's (2007) study), women recalled more information than men. Based on this result, we might predict that women's memories for words presented in the context of a relationship should be better than men's. This idea will be tested in the present experiment.



With Bloise and Johnson's (2007) study that found the ability of higher recall of emotional information in women, other studies have sought to find if emotions experienced during a situation are altered when that situation has passed. Pasupathi (2003) examined the variability of emotions in differing situations; more specifically, the emotions felt during the event and emotionality experienced when recalling the situation at a later date. In the study, men and women were instructed to recount a situation in which they experienced emotion and had later told it to another person who had not experienced the event.

After thinking of a specific experience, the participants were asked to rate their emotions both during the event and in the time afterwards in which they recounted the event to another person. The results of the study indicate that with a positive experience, emotions were likely to stay similar in intensity between the actual event and the retelling. A difference was found in the negative experiences, with the actual experience being more stimulating of the negative emotion than afterwards, and men significantly had fewer negative emotions in the actual event and the recall portion than women.

Pasupathi's (2003) study found valuable information in the context that the level of intensity of emotions typically is reduced once the event has passed, and information that men are more likely to have less negative emotions overall, but especially once a situation is in the past. Using these findings, I hypothesize that

women will recall more negative words in the context of a relationship, even more so if they have experienced a negative relationship before and if that relationship was experienced in the past.

With Pasupathi's (2003) results that women tend to have higher negative emotions as compared to men in both actuality of experiences and the time afterwards, one study looked deeper to find if a gender difference as well as false recall exists when given negative words to remember. Dewhurst, Anderson, and Knott (2012) were determined to discover if a gender difference was present and influenced one's ability to have false recall in negatively valenced words.

The male and female participants were given instructions to view several lists of words in which half of the list was emotionally neutral valenced words and the other half of the list was negatively valenced words. At the end of viewing each, participants were instructed to recall as many words from the lists as possible. The results found that women were able to remember more words than men overall. Although there was no gender difference apparent in the false recall of neutrally valenced words, Dewhurst, Anderson, and Knott (2012) did find that women did falsely recall a greater number of negative words than did the male participants. Although female participants had a greater number of falsely recalled words, male participants were more accurate in recalling the correct negatively valenced words.

In regard to the study run by Dewhurst, Anderson, and Knott (2012), false recall of negatively valenced words could be apparent in the current experiment. If there is an amount of falsely recalled words, they would most likely to be seen construed from the female participants and with the negatively valenced words connected to relationships.

Dewhurst, Anderson, and Knott's (2012) study focused on the gender difference concerned with false recall of negatively valenced words. With gender differences being apparent in their study's findings, another study focused instead on gender differences that might appear in episodic memory of events. Herlitz, Nilsson, and Bäckman (1997) decided to further research gender differences in memory that had not been studied, or more specifically episodic memories.

The study by Herlitz, Nilsson, and Bäckman (1997) was divided into four sections focusing on various aspects of memory. The most specialized condition consisted of testing the participant's episodic memory abilities. The episodic tasks were broken into four conditions. The first task consisted of participants hearing a list of nouns while either completing a distractor task at the same time or not and were asked to recall the nouns while completing a distractor task or not. The second condition consisted of participants listening to false statements and being asked to answer questions about the statements once they had all been read. The third condition of the episodic memory section consisted of participants being asked to

perform an instruction given by the experimenter and then recall as many of those tasks as possible. The final condition of the episodic memory portion of the study was one in which participants were shown images of children's faces and names and then asked to recall both the images of the faces and the full names of the children. The participants then completed a semantic memory task, a primary memory task, and a priming task after the episodic tasks.

This study by Herlitz, Nilsson, and Bäckman (1997) found that within the episodic memory tasks, the female participants performed at a significantly higher level than did the male participants. The female participants overall had a higher level of encoding and retrieval than did the male participants in each of the episodic memory conditions. In relation to the current experiment, I believe that women will remember more words overall than men due to encoding and retrieval ability. The words used in the current experiment are related to emotion in relationships, or episodic memory, so I hypothesize that female participants will complete the task more successfully than the male participants.

Herlitz, Nilsson, and Bäckman's (1997) study consisted of searching into mainly episodic memory and the gender differences within that certain area of memory. The ability of genders to encode memories strongly is a main focus of the next study that focused on the recall of life events and the emotions that accompany those situations. Seidlitz and Diener's (1998) study was interested in whether

gender differences existed in the replication of life events. Although it had been found that gender differences do exist in the recall of memories, Seidlitz and Diener (1998) were curious whether the differences associated with gender would be present and significantly so in the replication of the recall of life events.

The study by Seidlitz and Diener (1998) consisted of three conditions. The conditions each measured one of four gender differences. The first difference measured was the varying mood intensity based on gender at the time of the life event. The second gender difference measured related to the first, but instead measured the variability in mood intensity when the event was recalled. The third difference focused on the gender variability in which they “retold” the event over a period of time. The final difference measured the amount of detail in which the event was encoded.

Seidlitz and Diener’s (1998) study was successful in finding gender differences in the recall of participant’s experiences. The study found that women were overall more likely to recall more positive and negative events than men. Since women were able to recall more events that intensified their mood in general than men, the ability of women to encode emotional information more deeply was apparent. With the results from Seidlitz and Diener’s (1998) study, I am able to conclude that in the current experiment, women will recall more words in the free recall task than men due to the emotionally-valanced word list.

One question that has not been addressed in the context of gender differences and cognition is the search to find gender differences within positively and negatively valenced words, specifically in the context of romantic relationships. In the current study, participants were asked to rate a list of positively valenced words and negatively valenced words that all related to a romantic relationship. Participants were instructed to rate each word on how much they thought the word applied to a “realistic” relationship with each participant judging on what a “realistic relationship” is in their opinion. After rating the words, participants completed a brief distractor math task. Participants were then asked to do a free recall of the words they had rated earlier. Afterwards, the participants were debriefed about the study and received class credit for their participation.

## Methods

### *Participants:*

Ninety-two undergraduate students from the University of Mississippi participated in the study in return for partial class credit.

### *Design and Materials:*

2 (gender) x 2 (valence: negative vs. positive) mixed design was employed with word valence as the within subject variable. The negatively valenced words were taken from Stadler, Roediger III, and McDermott's (1999) study. The positively valenced words were generated by the experimenter specifically for this study (See Appendix A). In addition to the word lists, a questionnaire (See Appendix B) including questions about relationships was administered after participants completed the recall portion of the study.

### *Procedure*

Participants arrived at the laboratory alone or in pairs and were asked to sign an informed consent form. After signing the consent form, they then listened to the instructions, which informed them that the study was focused on gender differences in memory recall for words related to a relationship. After listening to the instructions, participants rated 15 positively valenced words and 15 negatively valenced words on their significance to a realistic romantic relationship. Each word was presented 1 at a time for 5 seconds, and participants rated them on a scale from

1 to 5 with 1 being the least related to a romantic relationship and 5 being the most related. The words were presented alternating the negatively valenced words and the positively valenced words. After rating 30 words, participants completed a brief distractor task, which involved solving simple addition and subtraction math problems for 60 seconds. Then, participants completed a self-paced free recall test of the words they had previously rated. Once they completed the free recall portion of the study, participants were asked to answer some questions regarding their current relationship status. Finally, participants were debriefed and received credit for their participation.



## Results and Discussion

As noted above, the primary purpose of the present experiment was to determine whether gender differences existed for memory for positively and negatively valenced words, specifically in the context of romantic relationships. Participants were asked to rate a list of positively valenced words and negatively valenced words with respect to how each word was related to a realistic romantic relationship. We were primarily interested in determining whether memory for these valenced words differed as a function of gender.

Overall, a paired samples t-test demonstrated that participants remembered more positively valenced words than negatively valenced words,  $t(91) = 7.49, p < .0001$ . Thus, there was a tendency for participants to remember more positive words than negative words. However, an independent samples t-test indicated that women ( $M = 10.5$ ) and men ( $M = 9.39$ ) remembered a statistically equivalent number of words,  $t(90) = -1.59, p > .05$ . Thus, there were no gender differences observed in the overall recall of words recalled in the experiment. When only positively valenced words were considered (see Figure 1), there was also no statistically significant difference between men's and women's ability to recall the items,  $t(90) = -0.58, p > .05$ . So, similar to the results obtained for the overall number of words recalled, both men and women seemed to recall an equal number

of positively valanced words. However, when the negatively valanced words were considered, women were more likely to recall those words than men (see Figure 2). Overall, women recalled ( $M = 4.40$ ) more words that were negatively valanced than men ( $M = 3.54$ ), indicating that such words may have been encoded differently by women than men,  $t(90) = -2.00, p < .05$ .

As noted above, Roots (2005) demonstrated that negative images presented within an emotional context were more likely to be recalled by women than men. Similarly, Bloise and Johnson (2007) found that women's memories for emotional information was better than men's. The results of the current study replicate and extend those findings to include negatively valanced words processed in the context of a romantic relationship. Although it is not completely clear why such results were obtained, it is possible that women experience negative events surrounding relationships more viscerally than men. This could, in turn, lead to deeper processing of negative emotional events relative to positive events.

In addition to the results reported above, we also collected information regarding participants' experiences with romantic relationships. Specifically, we asked participants about whether or not they had ever been in a romantic relationship and whether or not they were currently in a romantic relationship. If they were in a current relationship, we further inquired about the length of the relationship and how satisfied they were with the relationship. It is possible that

some of these factors regarding relationship status may have affected participants' recall ability for the positively and negatively valanced words.

First, a series of independent samples t-tests was run to determine whether or not ever having been in a relationship influenced memory for the total number of words recalled, the number of positively valanced words recalled and the number of negatively valanced words recalled. All three tests were not significant (all  $p$ 's > .05). It did not matter whether the participant had been in a romantic relationship in the past or had not; that experience did not influence memory or recall.

Second, we wanted to determine whether being in a current relationship influenced participants' recall ability. Similar to the analyses performed for whether or not participants had ever been in a relationship, a series of t-tests was run to determine whether or not current relationship status influenced recall performance. The results indicated that current relationship status had no effect on recall performance for overall number of words recalled or the number of positively or negatively valanced words recalled in the current study, (all  $p$ 's > .05). We also found no reported differences between men and women who were currently in a relationship with respect to the length of that relationship,  $t(35) = 0.35, p > .05$ . However, for participants who were in a current relationship, there was a marginally significant difference with respect to relationship satisfaction.

Specifically, women reported having a greater level of satisfaction with their current relationship than men,  $t(35) = 1.72, p = .09$ .

Finally, we also measured the amount of time that it took participants to provide their ratings during the rating phase of the study in addition to recoding the actual ratings themselves. A series of independent samples t-tests indicated that both the response times and ratings were statistically equivalent for both women and men for both positively and negatively valenced words (all  $p$ 's > .05).

The main findings of the current study reiterate the gender differences that are apparent in the context of a romantic relationship. The findings indicate that gender differences do exist in the context of negatively valenced words. The limitations in the current study are that there were fewer male participants than female participants. Future studies could continue searching for gender differences in romantic relationships in another context. Future studies could also dive into examining if positive aspects or negative aspects of social relationships have any impact on gender. Future studies can look at more gender differences that are in social and romantic relationships and see if they can discover why women have more of a positive view of social and romantic relationships than men.

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Figure 1

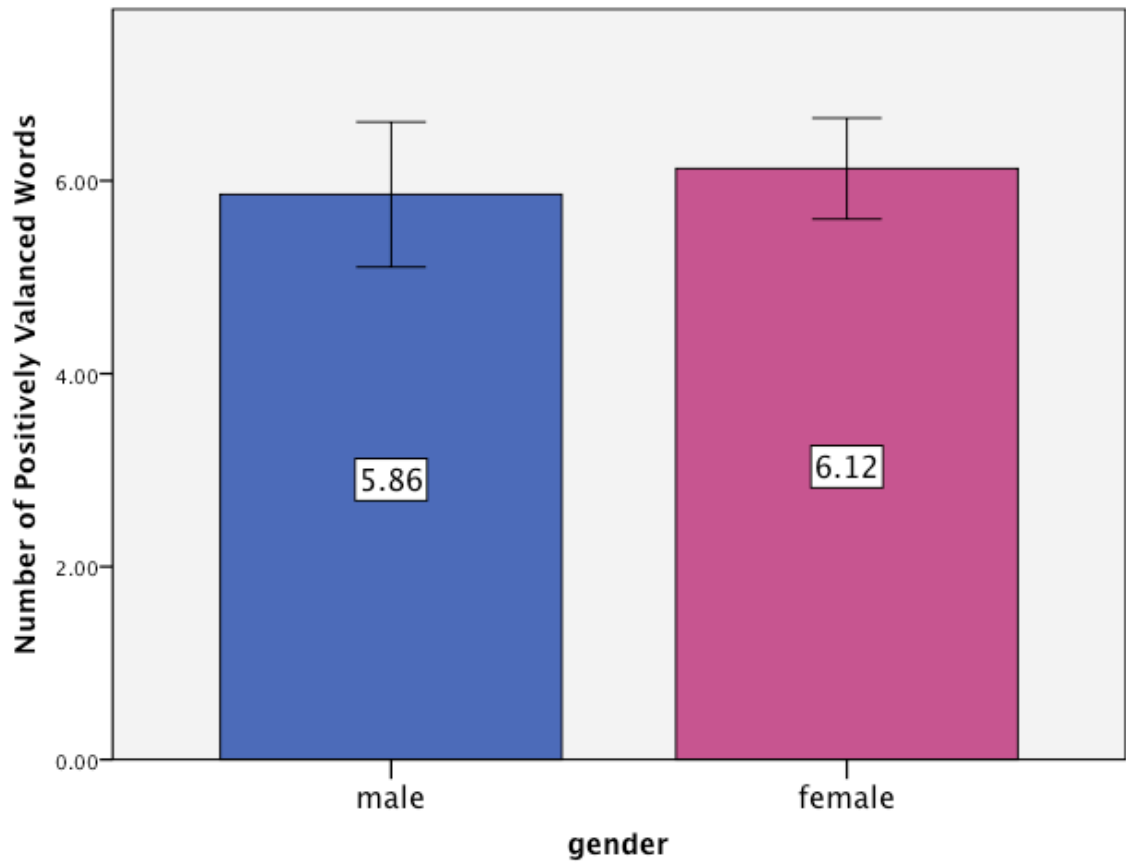
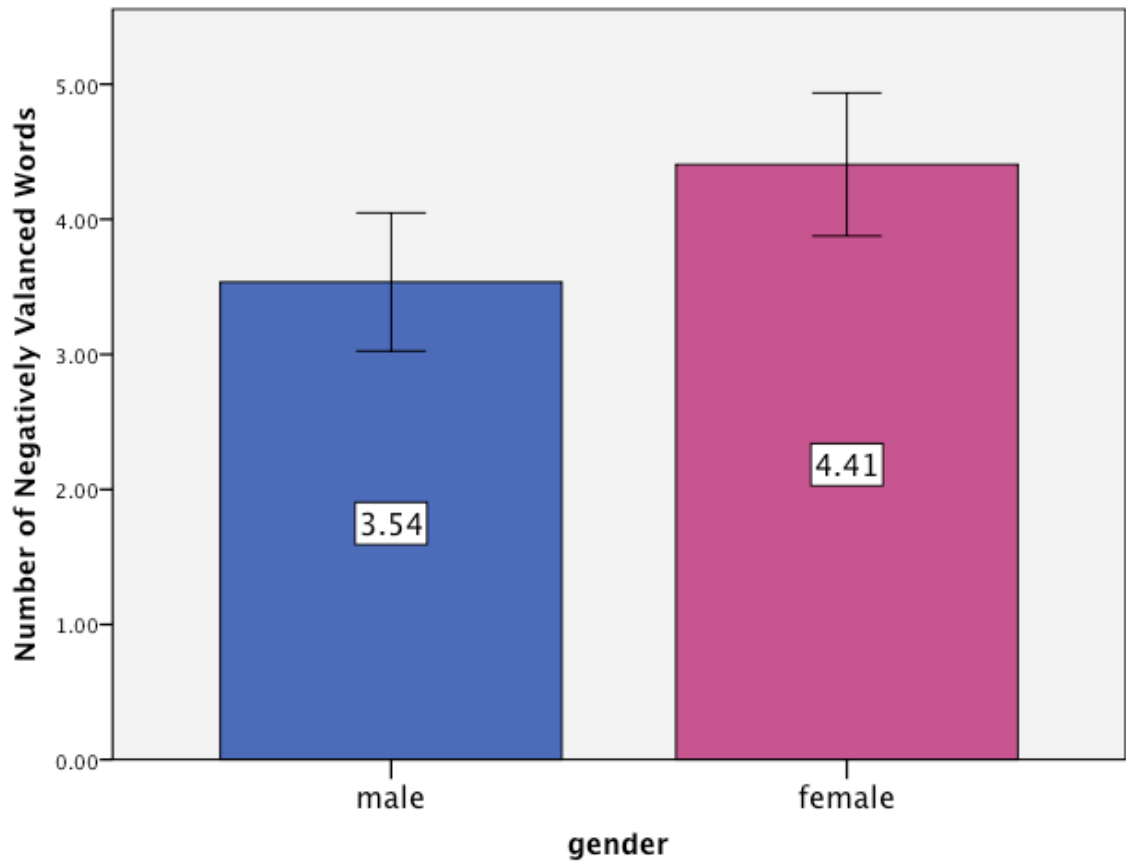


Figure 2



## Appendix A

### The Word List Used in the Experiment

#### List of Negatively Valanced Words:

Deceive  
Cheat  
Betray  
Dishonest  
Conflict  
Frustration  
Fight  
Tears  
Violent  
Annoy  
Irritate  
Argument  
Doubt  
Anxiety  
Corrupt

#### List of Positively Valanced Words:

Healthy  
Laugh  
Love  
Safe  
Honest  
Trustworthy  
Intimate  
Strong  
Joy  
Understanding  
Passionate  
Romantic  
Grounded  
Attractive  
Deep



## Appendix B

### The Questionnaire Used In The Experiment

Gender:

Have you been in a relationship before?

If so, how many?

Are you currently in a relationship?

How long have you been in this relationship? (by years)

How would you rate this relationship?

How long do you see this relationship lasting?