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# Research Methods

Spring 2007

*Primum non nocere*  
*- first do no harm -*

# Lindenwood University

Table of Contents

About the Research Methods Class of Spring 2007  
Dr. Michiko Nohara-LeClair.....page 2

**Memory**

*Memory Recall: Cued or Free*  
Meghan Thomson and Wendy Stamps.....page 3

*Noun-sense: Short-Term Memory and Correct Recall of Concrete, Abstract and Nonsense Words*  
Mindi E. Lovelady.....page 25

*Classical Recall: Analysis of the “Mozart Effect” On Basic Mental Tasks*  
Matthew Black, Steven Carter, and Adam Rose.....page 41

*Encoding Specificity: Applied to Communication Patterns in Recall Processes*  
Makandal P. Daaga.....page 57

**Social Perception and Gender Issues**

*Racial Stereotyping and Physical Perception of Crime*  
Jenn Malzone.....page 62

*Interpersonal Conflict Resolution: Differences Across Sex and Socially Established Behavior*  
Abby Ramon.....page 84

*The Sexual Image of Women in Television: The Effect on Young Women in America*  
Amanda Reed and Rachel Rogers.....page 102

*How Preferences Play a Role in Gender and Details*  
Jennifer Anstead and Brittini Martin.....page 116

### **About the Research Methods Class of Spring 2007**

One of the highlights of this course in the spring of 2007 came at the very end of the semester when we held our semiannual journal cover competition. Each semester, students in the class submit journal cover designs in hopes that their work would be chosen by their peers to appear as the cover of the research methods journal. As an added incentive, students whose cover designs place in the top three spots earn last minute bonus points toward the course. Although we have always had a fair number of cover designs submitted, the students in the spring of 2007 proved to be far more creative and enthusiastic about this cover design competition than any before them. Although there were only 13 students who contributed their research papers to this journal, there were 19 cover designs submitted and the decision process involved three very competitive voting rounds.

Looking back, such enthusiasm had always been a part of this semester's PSY404 class. The students tackled some very ambitious projects in such a limited amount of time, and many of them, as I am sure you will agree, managed to produce a very solid paper in the end. I am very proud to present this year's PSY404 journal and would like to thank Steven Carter, who designed the winning cover as well as to all of the students who put forth that extra effort to contribute to the excitement of the journal cover design competition. I am indebted to the staff members of the HSP, supporters of the HSP as well as IRB members, and individual faculty members and students who have been graciously supportive of student research. Lastly, but most of all, I am very grateful to Brooke Smith for serving as volunteer course tutor for the spring 2007 semester and for volunteering to edit this semester's journal, well after her graduation in May of 2007.

Dr. Michiko Nohara-LeClair  
Course Professor



## **Memory Recall: Cued or Free**

**Meghan Thomson and Wendy Stamps**

*Cues may be helpful to aid a person in memory recall. Two experiments were conducted in order to test the hypothesis that recall is enhanced with the presentation of cues. In Experiment 1, the recall performances for the same forty-eight participants were compared under cued and free recall conditions. A paired t-test was performed on the participants who received both cued and free recall questions. In Experiment 2, thirteen participants were given either cued only or free only questions to recall. An independent t-test was performed on the participants who received only cued recall questions or only free recall questions. There was a statistically significant finding that cues do help in recall compared to no cues being provided.*

Bringing forth stored information can be a very difficult process. When taking a test, what allows people to recall information that they have studied? Also, can the memories be influenced or slightly manipulated by other thoughts? Different external factors can influence memories (Loftus, 1975). Therefore, people cannot fully trust memories due to the external factors that may have shaped those memories. Details seem to aid in the recall of stored information. Also known as cues, keywords can bring the desired information to surface more easily.

People are better able to remember things that they just read or that have just occurred than those facts less recently discovered (Marsh & Ahn, 2006). This is known as the recency effect. A study was performed based on similar and dissimilar cues in which subjects were

given either similar or dissimilar cues at input and output. Some subjects were allowed to recall the information immediately while others had to complete a task for thirty minutes before recalling the information. The results showed that if cues were similar at input and output, recall was more effective than if cues were dissimilar. In regards to the thirty minute interval, subjects were better able to recall information when they could do so immediately instead of having to wait thirty minutes (Wohl & Izawa, 1980). Also, if people have knowledge of the subject from previous learning, the memory is more stable and more easily recalled. As discovered in a study of older adults and their medications, another key factor is if the information is pertinent to their life, as the relevance can provide cues to remember (Insel, Morrow, Brewer, & Figueredo, 2006).

According to some models, cues must be the same at the input and output phase of recalling information. The encoding specificity principle states that for something to be remembered at recall, the same cue must be given both at the initial encounter of the information and the recalling of the information (Epstein & Dupree, 1977). Following the same view, Tzeng, Alva, and Lee (1979) found that it is easier for subjects to remember the meaning of a sentence if the cognitive surroundings are the same at input and output. This is an example of state dependent learning. A person must be in the same state of mind and environment surrounding at input and output to recall information.

In the Epstein and Dupree (1997) study, the principle of encoding specificity was proved wrong because participants created their own system of categorizing words if they were uncategorized at input. Their study can be explained by the generation-recognition model of retrieval; cues don't have to be present at input because subjects can create their

own cues. At recall, cues are helpful in remembering the information because of the cues generated by subjects themselves at input.

Opposing the idea that cues aid in memory recall, in one study, free recall held the best retention rate compared to cued recall and recognition. The fewer amount of cues provided on the final test resulted in better recall than the previous test with more cues (Carpenter & DeLosh, 2006). Some people prefer essays to multiple choice questions because of the lack of expression of their knowledge found in fixed alternative testing.

Another asset to recalling information is the use of imagery. If one can picture the information, it is easier to recall. Also, if the information is concrete, making it more distinct, the knowledge is more easily recalled (Paivio, Kahn, & Begg, 2000). By the use of imagery, one can connect a mental picture to the information being retained, making it more real to the person.

Memory has a special place in the brain. In the prefrontal areas, encoding and retrieval take place. If the frontal lobe is damaged, people can have trouble with free recall, cued recall and recognition memory (Hashimoto, Maruishi, Sawada, & Toshina, 2005). This can lead to difficulties with both long- and short-term memories.

The hypothesis of this study was that people would be able to recall more information when cues are provided. We tested participants to see if there was a difference in recalling information when given cues as opposed to when not. Two experiments were conducted to test our hypothesis.

*Experiment 1***Method***Participants*

For the first experiment, 48 participants were recruited from the Human Subject Pool at Lindenwood University. There were 17 men and 31 women who participated in our study. These participants were recruited from the general education courses in psychology, anthropology, and sociology. For their participation in the experiment, the participants received extra credit toward their course grade. Demographic information for participants from both experiments was as follows: the age of the participants ranged from 17 to 25. The mean of the ages of all sixty-one participants was 19.77 with a standard deviation of 1.717. There was a wide variety of participants from different countries including the United States, Spain, Brazil, Venezuela, Kenya, India, Mexico, Russia, Germany, Japan, Nepal, Ukraine, Bosnia, and Ecuador.

*Materials*

The experiment was conducted in a designated room in the Psychology Laboratory in Young Hall in Room 105. A total of four chairs and a table were provided. A stopwatch was kept handy to time the participants' responses to the questions. Pens were available for the participant to use to reply to the forms provided by the researchers. Two different stories were provided for the participant to read (see Appendices A1&B1). The stories were extracted from GRE basic reading comprehension practice tests (2007) from the World Wide Web. The related questions were not standardized but created by the experimenters from the information from the stories. Questions included cued recall, such as providing cues to help the participant to recall the information from memory and free recall format, not providing



any cues or hints to aid the participant in recalling the information (see Appendices A2, A3, B2, & B3). Examples of cued recall for the Ferdinand Magellan story would be: What famous Portuguese explorer led the first expedition to sail around the world? An example of free recall would be: Who led the first expedition to sail around the world? The questionnaire was provided at the end of the study for the participants to fill out (see Appendix C). Some of the questions that were asked in the questionnaire were about what type of recall, cued or free, the participant preferred on tests and whether or not the participants' native language was English for this could affect the results of the study. Participants were also asked about the difficulty of the stories to read and comprehend. The informed consent form was given to participants at the beginning of the study to obtain consent to perform the experiment. A feedback letter was given to the participants for their own records to explain the reasoning behind the study and to debrief them of any further questions.

### *Procedure*

First, we recruited participants from the Human Subject Pool at Lindenwood University. Next, the participant came into the Psychology Lab and sat down at the designated table where one of the researchers was sitting. The researcher handed the participant two informed consent forms, one for his or her records and one for our records. Both consent forms were signed by both the participant and researcher. Then, the participant was given a participant receipt form to fill out with all of his or her information to receive extra credit toward his or her class. The receipt form was to be taken to the Human Subject Pool office located in Young Hall, room 407 after the experiment. Before the experiment started, the participant was assigned an ID number and group number unbeknownst to the

participant. The reasoning behind doing this was to provide anonymity for the responses to the questions. A group number was assigned to the participant to provide counterbalancing between the different stories and questions and the experimenters kept track of which participants received which method of recall with which story. The participant ID number and group number were counterbalanced by means of a Latin Square Design to keep anonymity between the participants.

Participants received both a cued recall and a free recall question format to answer from the two different stories that were provided. The participant was handed an instruction form to read. If the participant had any questions about the experiment, he or she was instructed to ask them before the experiment started. The researcher handed the participant a story to read. The orders of the stories were counterbalanced between participants. The participant was instructed to read the first story only once and then let the researcher know when he or she was finished. Once he or she was finished reading the story, the researcher took away the story and handed the participant a list of questions, free or cued recall, to answer in five minutes. The order of free or cued recall questions were counterbalanced between participants. The researcher timed the participant for five minutes and after the participant was finished, the researcher took the question list away and asked the participant to count aloud to 100 by fours. The participant was asked to do this to prevent information from the first story to interfere with the next story he/she was about to be read, which is known as practice effect.

After the participant had finished counting to 100 by fours, the researcher handed the participant the other story and was told to once again to read the story only once and let the researcher know when he or she was finished reading. Once the participant let the researcher

know that he or she was finished reading the story once, the researcher took the story away and handed the participant another list of questions, counterbalanced from the time before. The researcher gave the participant for five minutes to complete the questions to the best of his or her knowledge. After the participant was finished answering the second set of questions, he or she was then given a questionnaire to fill out about memory recall. Once the participant finished filling out the questionnaire, the researcher provided him or her with the feedback form to read and ask any questions that he or she might have about the experiment, while debriefing the participant. The participant was made aware of the researchers' contact information if he or she wished to know the results of the study after it was conducted.

A within-subjects design for their experiment in an attempt to show which method of recall, free or cued, was more effective in remembering information. The researchers wanted the same person to provide information for both methods to have a better idea of which method helps in the recall of information.

### **Results**

A paired t-test was performed on participants' responses to cued recall and free recall. The results of the paired t-test revealed a significant finding that participants' responses to cues ( $M= 3.54$ ) was more effective in recalling information than responses to questions with no cues provided ( $M= 2.58$ ),  $t(23) = 3.154$ ,  $p < .05$ .

### *Experiment 2*

In addition, the researchers wanted to see if the story order made a difference in participants' responses, so a second experiment was conducted using a between-subjects design. In the between-subjects design, thirteen participants were either given only cued recall questions to answer for both stories, or free recall questions to answer for both stories.

The reasoning behind conducting two separate experiments was to find out if participants were better able to remember more information from the stories provided with or without cues. The first experiment had both cued and free recall questions. The second experiment consisted of participants receiving either only cued recall questions or only free recall questions to answer about the two stories.

## **Method**

### *Participants*

For the second experiment, thirteen additional participants were recruited from the Human Subject Pool at Lindenwood University. There were five men and eight women who participated in our study. These participants were also recruited from the general education courses in psychology, anthropology, and sociology just like in experiment 1. For their participation in the experiment, the participants received extra credit toward their course grade. The age of the participants ranged from 18 to 24.

### *Materials*

The experiment was conducted in a designated room in the Psychology Laboratory in Young Hall in Room 105. A total of four chairs and a table were provided. A stopwatch was kept handy to time the participants' responses to the questions. Pens were available for the participants to use to reply to the forms provided by the researchers. Two different stories, the same stories that were used in experiment one, were provided for the participant to read (see Appendices A1&B1). The stories were extracted from GRE basic reading comprehension practice tests (2007) from the World Wide Web. The related questions were not standardized but created by the experimenters from the information from the stories. The questions, which were also used in experiment one, included either cued recall, such as

providing cues to help the participant to recall the information from memory or free recall format, not providing any cues or hints to aid the participant in recalling the information (see Appendices A2 & B2 or A3 & B3). Examples of cued recall for the Ferdinand Magellan story would be: What famous Portuguese explorer led the first expedition to sail around the world? An example of free recall would be: Who led the first expedition to sail around the world? The same questionnaire from experiment one was provided at the end of the study for the participants to fill out (see Appendix C). Some of the questions that were asked in the questionnaire were about what type of recall, cued or free, the participant preferred on tests; whether or not the participant's native language was English because this could make a difference in the results of the study. Participants were also asked about the difficulty of the stories to read and comprehend. The informed consent form was given to participants at the beginning of the study to obtain consent to perform the experiment. A feedback letter was given to the participants for their own records to explain the reasoning behind the study and to debrief them of any further questions.

### *Procedure*

Experiment two used the same procedure as in experiment one except that the participants received either free recall questions or cued recall questions. The participant filled out an informed consent form and participant receipt. The participant was given instructions to know what was expected of them for the experiment. After the participant confirmed that he or she understood what to do for the experiment, the researcher handed the participant a story to read over once. Once the participant finished reading over the first story only once, he or she turned in the copy of the story, and then given either a free or cued question format, the order of which was counterbalanced, to complete. The participant was

given five minutes to answer the questions, then asked to count aloud to 100 by fours. Next, the participant was given the second story. Once the participant finished reading over the second story only once, he or she let the researcher know and then handed in the story and received the second set of questions, either free or cued, but the same format as the set of questions for the first story. After the participant finished answering the questions during the five minute time lime, he or she was then asked to fill out a questionnaire. After filling out the questionnaire, participants were then debriefed of the experiment with the feedback letter and were informed of the researchers' contact information.

### **Results**

A between-subjects design was used for experiment 2 in order to determine if participants were better able to answer cued recall questions or free recall questions. We tested different participants to see if they would recall more information if they were only given cues to answer the questions or if they were not given any cues to answer the questions. An independent t-test was conducted, and a statistically significant result was found,  $t(35) = 2.665$ ,  $p < .05$ . Participants that were given only the cued recall format were more likely to recall the information from the story. The mean of the cued only recall task was 6.83 with a standard deviation of 2.15. The mean of the free only recall task was 4.74 with a standard deviation of 2.60.

In order to discover if the stories we used to test participants were similar in difficulty level, we performed a paired samples t-test on the Ferdinand Magellan and Marie Curie stories, based on the participants' responses to the question of difficulty on the questionnaire. We found that the stories were similar in difficulty level both with a mean of 2.93. The paired t-test resulted in a significant two-tailed test between the stories,  $t(60) = 0.00$ ,  $p > .05$ .



This t-test shows that the stories were similar in difficulty level. The researchers also wanted to determine if the order of the stories in which the participants' received made a difference in recall. In order to prevent order effects, we counterbalanced the order of the stories between participants. Furthermore, we wanted to make sure that the story order did not create a confounding variable in our experiment. The results of the two-tailed paired t-test showed that the order of the stories had no effect on the recall of information for participants,  $t(60) = -1.793, p > .05$ .

### **General Discussion**

The results of our experiment support our hypothesis that people will recall more information when provided with cues than when they are not provided with cues. In experiment 1, we tested to see if participants recalled more information from the two stories when they were given cues over when they were not given cues. We counterbalanced the stories and the recall format (cued or free recall questions). The results of our first experiment coincide with our hypothesis that cues do help in the recall of information. We then wanted to see if the stories that we used were similar in difficulty level. We wanted to find out if the Ferdinand Magellan story and the Marie Curie story were the same in regards to the participants' ability to comprehend and understand the information presented. We found that the stories were almost identical in difficulty level.

Furthermore, we wanted to determine if the order in which the stories were given to participants had an effect on recall. We found that the order of the stories did not have an effect on the recall of information. We controlled for a possible confounding variable of order effects by counterbalancing the stories in which the participants received them. We

controlled for the possible confound of difficulty level of stories by testing to see if the stories were similar in complexity.

In order to confirm the strength of our hypothesis, we performed an additional experiment to see if participants that were provided with cues had more of an advantage of recalling information than participants who were not giving any cues at all. The second experiment consisted of an additional set of participants who were either given only cues to recall information from both stories or were not given any cues at recall. The experiment showed that people who were provided with cues only, recalled a greater amount of information than those who were not given any cues to recall information from the stories provided.

In regards to our experiments, we should have taken into account those who do not like history because both stories were historical accounts of Ferdinand Magellan and Marie Curie. However, the stories were taken from a standardized source, practice GRE tests. We should have possibly found stories that were more generalized to our participant population, although we would always have the problem of someone not liking a particular subject. Also, a participant from Spain was more at an advantage of recalling information about the Ferdinand Magellan story because of familiarity with it because it is part of the country's history. In addition, some people enjoy history (Ferdinand Magellan) over science (Marie Curie). However, as stated earlier, our results show that there was no difference in the story relationship of which one was easier than the other. They were both similar in difficulty.

In our second experiment, we may not have had a representative sample of the population because we didn't acquire as many participants as is required for this between-subjects design. Our goal was to recruit twenty-four participants to create a representative

sample but only thirteen showed up for the experiment. The lack of participants may have had an effect on the results of the second experiment even though significance was found for cued only recall.

In our results, we performed two t-tests: a paired t-test for the first experiment and an independent t-test for the second experiment. The paired t-test for the within-subjects design showed significance for the cued recall task and the independent t-test for the between-subjects design showed significance that when participants only received cues for recall, they were more effective in remembering information. Counterbalancing was performed to counteract order effects and practice effects.

The reasoning behind the two experiments were to find out if participants were better able to recall information from the stories if they were given both free or cued questions to answer or if recall was similar to experiment one in which participants were given either free or cued questions.

Moreover, the significance of our findings can be beneficial to others because people can use cues to help recall more information for exams, presentations, memory tasks, and remembering important information. Cues can make it easier for people to recall information when others are relying on that information to be relayed.

## References

- Carpenter, S.K., & DeLosh, E.L. (2006). Impoverished cue support enhances subsequent retention: Support for the elaborative retrieval explanation of the testing effect. *Memory & Cognition, 34*(2), 268-276.
- Epstein, M.L., & Dupree, D.A. (1977). Category headings as recall cues: A test of the principle of encoding specificity. *The Journal of General Psychology, 97*, 101-108.
- Hashimoto, Y., Maruishi, K., Sawada, K., & Toshina, T. (2005). Grand rounds: Familiarity effect on retrieval: A neuropsychological case study. *Applied Neuropsychology, 12*(4), 224-231.
- Insel, K., Morrow, D., Brewer, B., & Figueredo, A. (2006). Executive function, working memory, and medication adherence among older adults. *The Journals of Gerontology: Series B Psychological sciences and social sciences, 61B*(2), 102-107.
- Loftus, E.F. (1975). Leading questions and the eyewitness report. *Cognitive Psychology, 7*, 560-572.
- Marsh, J.K., & Ahn, W.K. (2006). Order effects in contingency learning: The role of task complexity. *Memory & Cognition, 34*(3), 568-576.
- Paivio, A., Khan, M., & Begg, I. (2000). Concreteness and relational effects on recall of adjective-noun pairs. *Canadian Journal of Experimental Psychology, 54*(3), 149-160.
- Tzeng, O.J.L., Alva, I.C., & Lee, A.T. (1979). Meaning specificity in sentence processing. *British Journal of Psychology, 70*, 127-133.

Wohl, M., & Izawa, C. (1980). Congruency, scoring method, and encoding specificity in cued recall. *The Journal of General Psychology*, 102, 13-26.

## Appendix A1

### Story #1

In the 16<sup>th</sup> century, an age of great marine and terrestrial exploration, Ferdinand Magellan led the first expedition to sail around the world. As a young Portuguese noble, he served the king of Portugal, but he became involved in the quagmire of political intrigue at court and lost the king's favor. After he was dismissed from service to the king of Portugal, he offered to serve the future Emperor Charles V of Spain.

A papal decree of 1493 had assigned all land in the New World west of 50 degrees W longitude to Spain and all the land east of that line to Portugal. Magellan offered to prove that the East Indies fell under Spanish authority. On September 20, 1519, Magellan set sail from Spain with five ships. More than a year later, one of these ships was exploring the topography of South America in search of a water route across the continent. This ship sank, but the remaining four ships searched along the southern peninsula of South America. Finally, they found the passage they sought near a latitude of 50 degrees S. Magellan named this passage the Strait of All Saints, but today we know it as the Strait of Magellan.

One ship deserted while in this passage and returned to Spain, so fewer sailors were privileged to gaze at that first panorama of the Pacific Ocean. Those who remained crossed the meridian we now call the International Date Line in the early spring of 1521 after 98 days on the Pacific Ocean. During those long days at sea, many of Magellan's men died of starvation and disease.

Later Magellan became involved in an insular conflict in the Philippines and was killed in a tribal battle. Only 1 ship and 17 sailors under the command of the Basque navigator Elcano survived to complete the westward journey to Spain and thus prove once and for all that the world is round, with no precipice at the edge.

Source: [www.testprepreview.com/modules/reading1.htm](http://www.testprepreview.com/modules/reading1.htm)



## Appendix B1

### Story #2

Marie Curie was one of the most accomplished scientists in history. Together with her husband, Pierre, she discovered radium, an element widely used for treating cancer, and studied uranium and other radioactive substances. Pierre and Marie's amicable collaboration later helped to unlock the secrets of the atom.

Marie was born in 1867 in Warsaw, Poland, where her father was a professor of physics. At the early age, she displayed a brilliant mind and a blithe personality. Her great exuberance for learning prompted her to continue with her studies after high school. She became disgruntled, however, when she learned that the university in Warsaw was closed to women. Determined to receive a higher education, she defiantly left Poland and in 1891 entered the Sorbonne, a French university, where she earned her master's degree and doctorate in physics.

Marie was fortunate to have studied at the Sorbonne with some of the greatest scientists of her day, one of whom was Pierre Curie. Marie and Pierre were married in 1895 and spent many productive years working together in the physics laboratory. A short time after they discovered radium, Pierre was killed by a horse-drawn wagon in 1906. Marie was stunned by this horrible misfortune and endured heartbreaking anguish. Despondently she recalled their close relationship and the joy that they had shared in scientific research. The fact that she had two young daughters to raise by herself greatly increased her distress.

Curie's feeling of desolation finally began to fade when she was asked to succeed her husband as a physics professor at the Sorbonne. She was the first woman to be given a professorship at the world-famous university. In 1911, she received the Nobel Prize in chemistry for isolating radium. Although Marie Curie eventually suffered a fatal illness from her long exposure to radium, she never became disillusioned about her work. Regardless of the consequences, she had dedicated herself to science and to revealing the mysteries of the physical world.

Source: [www.testprepreview.com/modules/reading1.htm](http://www.testprepreview.com/modules/reading1.htm)

## **Appendix A2**

### Story #1 Free Recall Questions

1. Who led the 1<sup>st</sup> expedition to sail around the world?
2. Who did he serve in Spain?
3. What did this explorer name the discovery that he found?
4. Where was this first explorer killed?
5. What did the explorers' prove to be wrong?

### **Appendix A3**

#### Story #1 Cued Recall Questions

1. What famous Portuguese explorer led the 1<sup>st</sup> expedition to sail around the world?
2. This famous explorer served what Spanish emperor?
3. What was the name of the strait that this explorer found?
4. What Southeast Asian country was this explorer killed at?
5. What famous false belief about the world did these explorers' prove to be wrong?

## **Appendix B2**

### Story #2 Free Recall Questions

1. What did Marie Curie and her husband, Pierre, discover?
2. What is this element used for?
3. What kind of a job did Marie's father have?
4. Where did Marie receive her education?
5. When did Marie receive the Nobel Prize?

### **Appendix B3**

#### Story #2 Cued Recall Questions

1. What radioactive element did Marie and her husband, Pierre, discover?
2. What type of disease is this element used for today?
3. A man of great knowledge and wisdom and a willingness to help others learn, what kind of profession did Marie's father have?
4. What French university did Marie attend?
5. In the beginning of the 20<sup>th</sup> century, Marie received the Nobel Prize. What year did she receive this award?

## Appendix C

### Memory Recall Questionnaire

Participant ID # (to be randomly assigned by experimenter): \_\_\_\_\_

Group Letter (to be randomly assigned by experimenter): \_\_\_\_\_

1. Age:
2. Gender:
3. Country of Origin:
4. Major:
5. Are you a native English speaker?
6. Do you think that you will be able to apply the use of cues to your studying habits and test taking skills?
7. On tests, do you prefer short answer questions or multiple choice and true or false questions?
8. Were both stories about the same in regard to their level of difficulty to read?
9. Were both stories about the same in regard to their level of difficulty to comprehend (in other words, did you understand the material presented in the story?)



**Noun-sense: Short-Term Memory and Correct Recall of  
Concrete, Abstract and Nonsense Words**

**Mindi E. Lovelady**

*Retrieval of items from short-term memory is a repeat phenomenon in an individual's everyday life. Recall of some information from short-term memory is more readily available than others, but learning to maximize the amount of information that is retrieved is possible. Using retrieval techniques that involve word concreteness could be of utility in retrieval of information. 81 undergraduate participants were recruited at Lindenwood University. Each participant was asked to complete a task involving the STM recall of words from a list. The list incorporated concrete and abstract nouns, with nonsense words. Participants demonstrated, with significance, the ability to recall more concrete nouns than abstract nouns or nonsense words. Participants also recalled, with significance, abstract nouns over nonsense words.*

*Memory can be defined as the storage, retention, and recall of information over a period of time. Memory can be categorized into two separate stores; Long-term memory (LTM), and Short-term memory, (STM) (Baddeley, 1974).*

STM can be described as memory that allows an individual to recall limited amounts of information for a limited amount of time. *The Magical 7±2*, written by George A. Miller, argues that the capacity of the STM is limited to seven plus or minus two units of information. *Chunking* can be defined as a mnemonic device that is used to increase the capacity of STM, but research indicates that the “chunks,” although they contain more information, still seem to be limited to seven plus or minus two chunks (Miller, 1956).

The way that information seems to be lost from STM is similar to the way that information is lost from LTM, it just seems to happen in an expedited manner. Learning is a physiological process, and information seems to be lost from STM more readily because it has not been studied as well (Baddeley, 1974).

STM has a phonological loop as well as a visuospatial sketchpad. This means that the ability to recall an item is related to how long it takes to read the word as well as whether or not the item sounds like other items that are requested to be recalled. Baddeley (1974) suggests that words are harder to remember if they are longer than other words and if they sound like other words.

The ability to recall an item from memory is also thought to be influenced by how meaningful the item is to the individual but the *concreteness*, or the ability to visualize the item, is also related to the ability to recall the item. An item that is considered to be low in concreteness is said to be *abstract*, (it does not cue a mental image when the item is thought of). For example, microscope, desk and pen are concrete nouns and glory, freedom, and idea are examples of abstract nouns (Paivio et al, 1956).

The concrete and abstract words that were used in this study were taken from a list of nouns that have been scored as having high or low concreteness. This list of words was published in a paper written by A. Paivio, J.C Yuille and S.A. Madigan; *Concreteness, Imagery, and Meaningfulness Values for 925 Nouns*. This paper also included a list of *nonsense* words. That is, words that are pronounceable, but have no real meaning in the Standard English dialect. Crove, lumal, natpem and rispaw are examples of nonsense words that were included in paper. Nonsense words are not considered to be concrete or abstract (Paivio et al, 1956).

The words taken from the list of 925 nouns were incorporated into a Word List that contained 21 words. The words that were included on each list were similar in length and syllables and they were dissimilar in the way that they sound. This was done to help prevent phonological loops, (auditory loops), from influencing the participant's recall of items, as Baddeley (1976) suggested.

Level of processing may be related to an individual's ability to recall a word. If an item is more deeply processed into STM, such as use of mental imagery when considering the item, the item is more likely to be recalled ( Craik & Lockhart, 1972).

A within-subjects, (Repeated Measures) design was used to test each participant's ability to recall the nouns presented on the word list. All three levels of the independent variable were present on each variation of the Word List, making it possible to obtain all of the necessary information in one task.

Participants were asked to review the list of 21 words for 45 seconds and immediately following the review, participants were asked to recall as many words from the list that they were able to. They were instructed that they did not need to recall the words in any particular order.

It was predicted that participants would recall, with statistical significance, more concrete nouns than abstract nouns or nonsense words. It was also predicted that abstract nouns would be recalled significantly more than nonsense words. One Way Repeated Measures Analysis of Variance, (ANOVA), was used to analyze the results.

## Method

### *Participants*

Eighty one participants, (37 male and 44 female), were recruited through a population of undergraduate students at Lindenwood University. Ninety seven individuals initially participated in this experiment, however the data obtained from 16 of those individuals was discarded because those participants indicated on the questionnaire, that English was not their native language. This study is specific to language and memory and other variables may influence the scores obtained from individuals who speak English as a second or third language.

The age of the participants ranged from 18 to 24 years. The mean age of participants was 20. Participants were not recruited with any incentive or compensation, but they were thanked upon completion of the experiment and invited inquire about the results in the future.

Participants were enrolled in Introduction to Anthropology and Introduction to Sociology courses and recruited through these respective classes. Each of the Introduction classes fulfilled a requirement of the General Education curriculum at the university, and thus it is believed to be a representative sample of the population of students. Lack of prior knowledge of the subject area was desired, and thus testing Introduction students appears to be an adequate method of acquiring these types of students in a random manner.

### *Materials*

An Informed Consent Form, Directions, Word List, Demographic Questionnaire, Data Sheet and a Feedback letter that were specific to this experiment were developed and given to each participant (See Appendices A, B C, D, E, and F).

Three variations of the Word List were developed for use in this experiment; Word List A, Word List B, and Word List C (see Appendix C). All three lists contained the same words, but they were presented in a different order for exposure.

The Demographic Questionnaire (see Appendix E) inquired about each participant's age, sex, class rank, experience of stress related to the experiment, and any prior knowledge regarding abstract, concrete, and nonsense words.

A stopwatch and a well-lit, well ventilated classroom that contained at least 40 desks and chairs was also used in addition to the other materials developed for this study

### *Procedure*

Participants were each given a Participant's Packet containing two consent forms, Directions, Word List A, B, or C, an Answer Sheet, demographic questionnaire, and feedback letter. Participants were instructed to fill out the first two pages that contained the Informed Consent Forms and not to proceed any further than that until they were instructed. Participants were then asked to flip to page three of the packet and read the instructions. Verbal directions were given as well. Participants were asked not to flip to page four until instructed to do so. Once requested, participants flipped to the Directions and read them carefully. They were allowed the opportunity to ask questions to clarify the directions. Once every participant in the group indicated that he or she was ready to proceed, participants were told to flip to page five and begin reviewing the list of words they were presented with. Participants were allowed 45 seconds for this review task.

Once time ran out, participants were instructed to immediately flip to the next page and begin recalling as many of the words as they could. Participants were reminded that they need not recall the words in any particular order. Forty five seconds was the time allowed for

the recall task.

Upon completion of the review and recall task, participants filled out the Post-test questionnaire and asked any questions they had. Participants were instructed to remove the first and last page of their Participant's packet - which gave them a copy of the Informed Consent Form and Feedback Letter. The remaining portion of each participant's packet was collected. Participants were thanked for their participation and invited to contact the experimenter upon completion of the project. Before any scores were compiled into data, all identifying information was removed from the packets. Participants were only identifiable by their participant number.

### **Results**

An One-Way Repeated Measures Analysis of Variance, (ANOVA), was performed on the data obtained from each participant, regarding their responses in the recall task they were asked to complete. The analysis of the data obtained from the participants revealed a significant main effect of the experimental condition,  $F(1, 80) = 178.077, p < .05$ . Overall, participants demonstrated, with significance, ( $M = 4.010$ ) the ability to recall more concrete nouns from short-term memory than abstract nouns ( $M = 2.161$ ) or nonsense words ( $M = 1.004$ ). Three Tukey Tests were conducted and revealed that recall of concrete nouns had a significantly higher mean (main effect) ( $M = 4.010$ ) than the means of recall for both abstract nouns and nonsense words. The Tukey Tests also revealed that abstract nouns were recalled with statistical significance over nonsense words. Finally, the Tukey Tests revealed that nonsense words were not recalled with any significance.



## Discussion

As predicted, analysis of the aggregate data obtained from the participants revealed that not only is there a difference among means of the experimental conditions, but also, concrete nouns have a significantly higher mean in word type recall.

The results that were obtained in this study were highly consistent with the findings of Pavio, Yuille, and Madigan that suggests that the ability to recall information is in fact, related to the ability of an individual to visualize the information, as well as how meaningful the information is to a person.

An alternative explanation for the findings obtained from this research study could be related to the types of classes that were tested, size of the groups that were tested, prior knowledge of the subject area, and cheating (rendering scores invalid). This experiment could not control for extraneous variables, and thus these potential variables could have had an impact on the scores obtained from each participant.

Research in this area may be beneficial to students and to academic professionals in terms of memory enhancement and learning techniques. It may be possible to use these findings to explore alternative avenues for professionals to teach new material, and for students to explore new ways of committing material to memory.

In the future, it is suggested that researchers draw a sample population from Introduction (GE) classes for the various types of degrees offered at the university. Also, it may be wise to work with a partner. In dealing with the amount of data obtained from the participants, it would prove to be helpful to have two minds and two sets of hands at work. It would be helpful managing a larger group of participants, if two experimenters are present.

Presenting the material in “packet” form was a highly efficient way to conduct the

study. The flow of the task was smooth and there did not appear to be any problems or confusion in carrying out the task. If future researchers would like to be economical in the manner that he or she goes about conducting the study, it is wise to put the saved effort and time into preparation for conducting the study.

This effectiveness of this experiment and the ability to control for unknown or confounding variables is directly related to how the researcher goes about carrying out the study. A good rule of thumb for administering this task is to be able to have a large group of participants complete the task within five to seven minutes. Practice administering the experiment several times before it is actually carried out. Attention and memory are key, so the researcher must be clear, concise, and efficient with the participants.

### References

- Baddeley, A.D. (1974). Working memory: the psychology of learning and motivation; *Advances in research and theory*. New York, New York: Academic Press.
- Craik, F.I.M., & Lockhart, R.S. (1972). Levels of processing: A framework for memory research. *Journal of Verbal Learning and Verbal Behavior*. 11, 671 - 674.
- Miller, G. (1956).Magical seven plus or minus two; Some limits on our capacity for processing information. *Psychological Review*. 63, 81 - 97.
- Pavio, A., Yuille, J.C., & Madigan, S.A. (1968). Concreteness, imagery and meaningfulness values for 925 words. *Journal of Experimental Psychology*. 73, 3 - 47.

## Appendix A

### Informed Consent Form

I, \_\_\_\_\_, (print name), understand that I will be taking part in a research project that requests me to review a list of words for 45 seconds. Upon reviewing the set of words, I understand that I will be given 45 seconds to recall as many words as I am able to. I understand that I should be able to complete this experiment entirely in approximately five minutes. I am aware that my participation in this study is strictly voluntary and that I may choose to withdraw from the study at any time without any penalty or prejudice. I understand that the information obtained from my responses will only be analyzed as part of aggregate data and that all identifying information will be absent from the data in order to safeguard the anonymity of myself and all other participants.. I am also aware that my responses will be kept confidential and that data obtained from this study will only be available for research and educational purposes. I understand that any questions I may have regarding this study shall be answered by the researcher to the best of her ability. Finally, I verify that I am at least 18 years of age and legally able to give consent to participate in this research project.

\_\_\_\_\_  
Signature of Participant

Date:

\_\_\_\_\_  
Signature of Researcher Obtaining Consent

Date:

### Contact Information

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## Appendix B

### **Directions**

You will be given 45 seconds to study a list of 21 words. Please review as many words as you can before time is up. Once time is up, you are asked to immediately attempt to recall as many words as you are able to. You will be given 45 seconds to complete this task.

Please mark your answers on the Answer Sheet that you have been provided with. You do not have to recall the words in any particular order.

Please do not flip this page until you are instructed to do so. Also, please do not begin marking on the Answer Sheet until you have been instructed to do so. I will let you know when to flip your pages, (from Directions to the Word List, and from the Word List to the Answer Sheet).

Please use your Answer Sheet to recall as many words as you are able to in the amount of time that you are given.

Finally, upon completion of the experiment, I will ask you to complete a Post-Test Questionnaire, and I will provide you with a Feedback Letter regarding this experiment.

Do your best, but please do not stress yourself if you feel that you are unable to recall many or any words. Your participation in this experiment is beneficial in any event.

## Appendix C

### Word List A

bird

concept

ator

arrow

moral

crove

microscope

effort

rispaw

apple

interest

firap

money

chance

persait

pencil

glory

natpem

table

honor

lumal

**Appendix D**

**Answer Sheet**

Participant Number: _____
------------------------------

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## Appendix E

### Post-test Questionnaire

1. How old are you?
2. Are you male or female?  
MALE          FEMALE
3. Please indicate your class level at Lindenwood University  
Freshman      Sophomore      Junior          Senior          Don Know
4. Have you ever suffered from amnesia or been subject to injury that a doctor has diagnosed to affect the performance or ability of your short-term memory?  
YES          NO
5. Before you participated in this study, were you familiar with the concept of concrete, abstract, and / or nonsense words?  
YES          NO
6. Did you, or are you experiencing any stress as a result of exposure to any or all of the words on the list you were presented with?  
YES          NO
7. Is English your native language?  
YES          NO

## Appendix F

### Feedback Letter

Thank you for participating in my research project. The study you were involved in was to determine if people are able to correctly recall more *concrete* or more *abstract* words with statistical significance. A *concrete* word is a word that cues a mental image when you think of it. An *abstract* word does not cue an image. The word list that you were given to review also contained nonsense words. A *nonsense* word is pronounceable, but it has no meaning. It is neither concrete nor abstract. I predict that participants will be able to correctly recall more concrete words than abstract words from the Word List that each participant was given. It is also predicted that participants will not be able to recall nonsense words with any significance.

The words that were presented to you in the Word List were obtained from a paper that was written by A. Paivio, entitled *Concreteness, Imagery, and Meaningfulness Values for 925 Nouns*, and it was published in the Journal of Experimental Psychology. Each word in the list was rated by the author as having high concreteness or low concreteness.

Please note that I am not interested in your individual results. Rather, I am only interested in the aggregate data of the larger group of participants involved in this particular experiment. No identifying information about you will be associated with any of the findings. Your participation in this project is greatly appreciated!

If you have questions or concerns regarding any portion of this study, please do not hesitate to inquire now or in the future. My contact information is found at the bottom of this letter. If you are interested in obtaining a summary of these findings at the conclusion of this project, I invite you to contact me and the results will be made available to you.

The results may be of interest or beneficial to you in your academic pursuits.

Thank you again for your valuable contribution to this study. I appreciate your time, effort and involvement.

Sincerely,

*Primary Investigator:*

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**Classical Recall: Analysis of the “Mozart Effect” On Basic Mental Tasks****Matthew Black, Steven Carter and Adam Rose**

*Researchers conducted a study based on the theory of the Mozart Effect to determine how well students at Lindenwood University performed on cognitive tasks when certain variables were manipulated. There were a total of twelve different conditions, in which the order of tasks, music, and hypothesis instructions were varied. It was concluded that no significant difference was found between any of the assigned conditions. Further research needs to be performed to determine if other variables would be better predictors of cognitive achievement, instead of the presence of classical music and priming participants with different hypotheses. If the Mozart Effect is to be researched in the same fashion, perhaps it would be beneficial to vary the type of music.*

In 1993, Rauscher and Shaw, explained a phenomenon known as the Mozart effect. According to their 1993 study, listening to Mozart sonatas while performing mental tasks improves a person’s functioning on spatial tasks (Rauscher, 2006). Shortly after, other psychologists came forward and made lofty claims about other possibilities such as long-term mental benefits in infants and children that listen to Mozart or other classical music.

Pop culture has since latched on to this idea, and we now have albums marketed towards infants, which claim to make the children more successful and intelligent (Mckelvie & Low, 2002). Even worse, the media has twisted the actual findings into claims that simply listening to Mozart’s music will make you gradually smarter (Cassity, Henley, & Markley, 2007). While these claims may be rooted in truth, there has been very little evidence to prove that this “Mozart effect” is something that scientists can be certain of improving or

enhancing mental tasks. Many psychologists have attempted to replicate this study, in a variety of different ways, but results so far have been very inconclusive.

Many critics have spoken out against the popular Mozart effect, and stated that these results were due to pre-existing differences in groups from the 1993 study by Rauscher (2006). Also, we do not know if these improvements in functioning are simply due to changes in arousal that could be brought on by any type of music, or if there is something specific about a Mozart sonata (Rauscher 2006). If this improvement in functioning because of listening to certain types of music is found to be true, the possibilities for improvement of society could be tremendous. If we were to saturate our culture with classical music, or begin having our children listen to Mozart during study times, mental capabilities and focus could dramatically improve over long periods of time. A great deal of the research concerning this topic was conducted using rats as participants, which raises some questions about possible generalizations to the human population. Actual data concerning humans and specifically children are sparse (Crnec, Wilson, & Prior, 2006). Many of the original studies have also been criticized for poor research designs.

The purpose for this study was to further the research about the Mozart effect in an unbiased manner, with the hope of eventually deciphering whether this phenomenon is due to chance or some other factor. A classical piece of music was used for this study, but not a Mozart sonata. Some of the research suggests that any music that is of a moderate to upbeat tempo will result in improved functioning (Husain, G., et al. 2002). The selected piece, *Doce de Coco* by Yo-Yo Ma, would be considered about a medium tempo.

Coming into this experiment, our research hypothesis was that participants would perform better on the given mental tasks if music was presented. However, regardless of the

results, this study serves the purpose of advancing the research in this area, and provides more data that can be built upon.

## **Method**

### *Participants*

Eighty-one Lindenwood undergraduate students were recruited through the Human Subject Pool and various psychology classes. Students from the Human Subject Pool were enrolled in entry level psychology, sociology, and anthropology courses. As compensation for their involvement, students received extra credit in their entry level courses. Students who chose not to participate in an experiment were given the option to write a paper for extra credit. After analyzing our data, 70.4% of the participants were women that participated in the experiment and 29.6% of the participants were men. About 80% of the students spoke English as their first language and 19.8% of the students that performed the experiment spoke another language as their first language. Forty percent of the participants were freshman, 29.6% of the participants were sophomore, 17.3% of the participants were junior, and 12.3% of the students were seniors. The youngest participant was 18 and the oldest participant was 46 years of age. Country music was the most preferred genre with 22.2% of the participants choosing it. The least favorite music was Blues with 3.7% of the students choosing this as their music preference.

### *Materials*

Participants were asked to fill out a questionnaire consisting of seven questions. The questionnaire, (see Appendix B) was made to determine gender, if English was their first language, age, music preference, if music is listened to while studying, and questions regarding their history of engaging in the types of cognitive tasks they did in the experiment.

These tasks were consistent for everyone and included anagrams (unscrambling words) and mazes (see Appendices C-F). We primed the participants with certain hypotheses based on a counterbalanced design. A third of the participants were told that classical music was shown to help cognitive tasks, a third were told that it doesn't help and the final third was given no priming hypothesis regarding the effectiveness of music. Two separate forms were used, each involving the completion of five anagrams and a maze. Most of these tasks were developed by the researchers specifically for this study, and the mazes were gathered through a random maze generator published on the internet. Five chairs, a room in the Psychology Lab in Young Hall at Lindenwood University, a computer with speakers to play Yo-Yo Ma's *Doce de Coco*, a clock, a large conference table, pencils, and paper were used for administering the experiments. Also, there was an informed consent form, and a feedback letter that was issued to participants.

### *Procedure*

In this design, after the participants walked into the room, we asked them to read and fill out the sign in sheet, informed consents, participant's receipt and questionnaire. The participants were then assigned to a specific task set to complete. Participants were asked to participate in two rounds of examinations, each round consisting of five anagrams and one maze; for each round, participants were allotted three minutes to complete the tasks. There were a total of twelve different conditions, in which the order of forms, music, and hypothesis instructions were varied (see Appendix A).

Each participant was given a specific combination of forms A and B, and to control any order effects, all combinations were used equally. With regard to our varying instructions, some participants were told that our hypothesis was that classical musical helps

mental functioning, others were told we believe it does not help and a third group were given no instructions regarding our hypothesis. Participants in all groups were timed and the time was recorded if the participant finished all of the given tasks before the three minutes were up. Following the experiment, participants were debriefed on the experiment, and given our feedback letter.

### **Results**

A 3x2 mixed factorial analysis of variance (ANOVA) was used to analyze each variable. Some t-tests were also used to analyze various descriptive statistics. It was found that there was no significance in the ability of each participant performing their tasks accordingly with the two stimuli (classical music, hypothesis instructions). We found no significance or support for our hypothesis in any of the conditions that would suggest that the hypothesis given or presence of music affects performance in completing mental tasks. In order to determine whether people scored higher with music or without music, we analyzed the data to reveal that it was not statistically significant,  $t_{(81)} = .083$ ,  $p > .05$ . We then conducted an analysis of how significant our hypothesis instructions were, after which we found no significance,  $F(2, 78) = .120$ ,  $p > .05$ . Lastly we analyzed the interaction between instruction and presence of music, in which we found no significance,  $F(2, 78) = .182$ ,  $p > .05$ . In an analysis of task sets and music presentations, there seem to be no correlation between task set and music presentation whatsoever.

### **Discussion**

Although our data did not confirm our original hypothesis that classical music would improve participants' scores on mental tasks, the study did line up with a great deal of previous research. It seems that psychologists are becoming increasingly adamant that the

data are not backing up the claims of the Mozart effect enthusiasts. Only occasionally does a study come along which supports a “Mozart effect,” which leads us to believe there may be some other variables contributing to previous results. To be taken seriously, these results would need to be far more consistent.

While our study did add to the body of work on this topic, we would like to have learned a little more from our efforts. Because we tested participants on the anagrams and mazes during the same trial, we could not measure the effects that the music had on the maze task or anagrams independently of the other. In a future study, we would definitely keep these tasks separate with a different time frame, so that the differences could be measured easily.

During this study we also expected to find better scores in groups that knew our hypothesis was that music would help on mental tasks. We told certain people that our hypothesis was that music helps on mental tasks, told others that our hypothesis was that music did not help on mental tasks, and others were not informed of our hypothesis. Interestingly, all three of these groups scored almost identically, which indicates that the participants were not affected by our instructions.

There is still a great deal of room for more studies of this type. The results have been inconclusive to this point, and researchers could also look at a wide variety of combinations between different mental or spatial tasks paired with different types of music or other activities. The most important thing to note from this study is that the Mozart effect is far more popular than it should be, based on the limited amount of research which confirms that it is real.



After a conference with our professor, new light has been shed on our experiment. It has been brought to our attention that the design of our experiment was in fact, faulty. The majority of cases in our design were laden with confounding variables. Many participants were subjected to the same form of anagrams and mazes twice. While this helped the argument for the practice effect, it greatly cut down the number of valid trials we had to analyze the benefits of music on cognitive tasks. We re-analyzed our data, yet we still found no significance.

Our dependent variable has also been scrutinized for failing to represent the true ability of our participants. In our design, we capped the time limit for each round of tasks at three minutes. However, in previous discussions with our professor and group members, we agreed that three minutes should have been ample time to complete these tasks. In future studies, it may be more beneficial to base the dependent variable on the number of correct responses, rather than a timed completion.

### References

- Cassity, H. D., Henley, T. B., & Markley R. P. (2007), The Mozart effect: Musical phenomenon or musical preference? A more ecologically valid reconsideration. *Journal of Instructional Psychology*, 34(1), 13. Retrieved 4/26/07 from Proquest Psychology Journals.
- Crnec, R., Wilson, R. J., & Prior, M. (2006). No evidence for the Mozart effect in children. *Music Perception*, 23(4), 305. Retrieved 4/26/07 from Proquest Psychology Journals.
- Husain, G., Thompson, W. F., & Schellenberg, E. G. (2002). Effects of musical tempo and mode on arousal, mood, and spatial abilities. *Music Perception*, 20(2), 151-171. Retrieved 3/6/07 from Proquest Psychology Journals.
- McKelvie, P., & Low, J. (2002). Listening to Mozart does not improve children's spatial ability: Final curtains for the Mozart effect. *British Journal of Developmental Psychology*, 20, 241-258. Retrieved 3/6/07 from Proquest Psychology Journals.
- Rauscher, F. H. (2006). The Mozart effect in rats: Response to Steele. *Music Perception*, 23(5), 447. Retrieved 3/6/07 from Proquest Psychology Journals.
- Steele, K. M. (2006). Unconvincing evidence that rats show a Mozart effect. *Music Perception*, 23(5), 455. Retrieved 4/26/07 from Proquest Psychology Journals.
- Steele, K. M. (2003). Do rats show a Mozart effect? *Music Perception*, 21(2), 251-265. Retrieved 4/26/07 from Proquest Psychology Journals.

**Appendix A**

- 1A) P told that classical music helps - do tasks A with music - do tasks B without music
- 1B) P told that classical music helps - do tasks B with music - do tasks A without music
- 2A) P told that classical music helps - do tasks A without music - do tasks B with music
- 2B) P told that classical music helps - do tasks B without music - do tasks A with music
- 3A) P told that classical music does not help - tasks A with music - tasks A without music
- 3B) P told that classical music does not help - tasks B with music - tasks B without music
- 4A) P told that classical music does not help - tasks A without music - tasks A with music
- 4B) P told that classical music does not help - tasks B without music - tasks B with music
- 5A) P not told hypothesis - tasks A with music – do tasks A without music
- 5B) P not told hypothesis - tasks B with music - do tasks B without music
- 6A) P not told hypothesis - tasks A without music - do tasks A with music
- 6B) P not told hypothesis - tasks B without music - do tasks B with music

**Appendix B**

Screening Questionnaire

1. Is English your first language?      Yes \_\_\_\_\_      No \_\_\_\_\_

2. Are you female or male?      Male \_\_\_\_\_      Female \_\_\_\_\_

3. What year are you in school?

Freshman \_\_\_\_\_      Sophomore \_\_\_\_\_      Junior \_\_\_\_\_      Senior \_\_\_\_\_

4. How old are you?

5. What is your favorite type of music?

Classical \_\_\_\_\_      Blues \_\_\_\_\_      R&B \_\_\_\_\_      Rap \_\_\_\_\_      Country \_\_\_\_\_      Other \_\_\_\_\_

6. Do you listen to music while you study? Yes \_\_\_\_\_      No \_\_\_\_\_

7. Which of the following mental tasks do you engage in? Check all that apply:

Anagrams \_\_\_\_\_

Mazes \_\_\_\_\_

On average, how many times a month do you engage in each task?

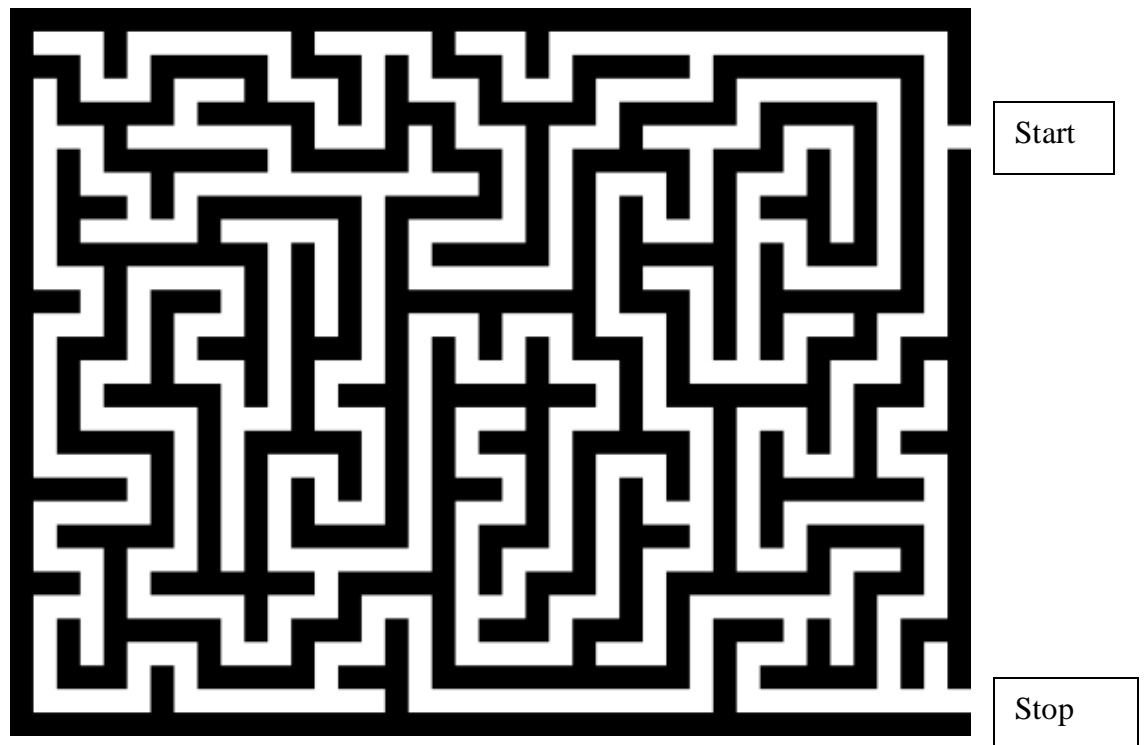
*(Please write your answer in the space next to each task)*

**Appendix C**

Form A.  
Anagrams

1. Pleoep
2. Njpaa
3. Richa
4. rwelfo
5. Cabkl

Maze



**Appendix D**

Form A. Anagram Answers

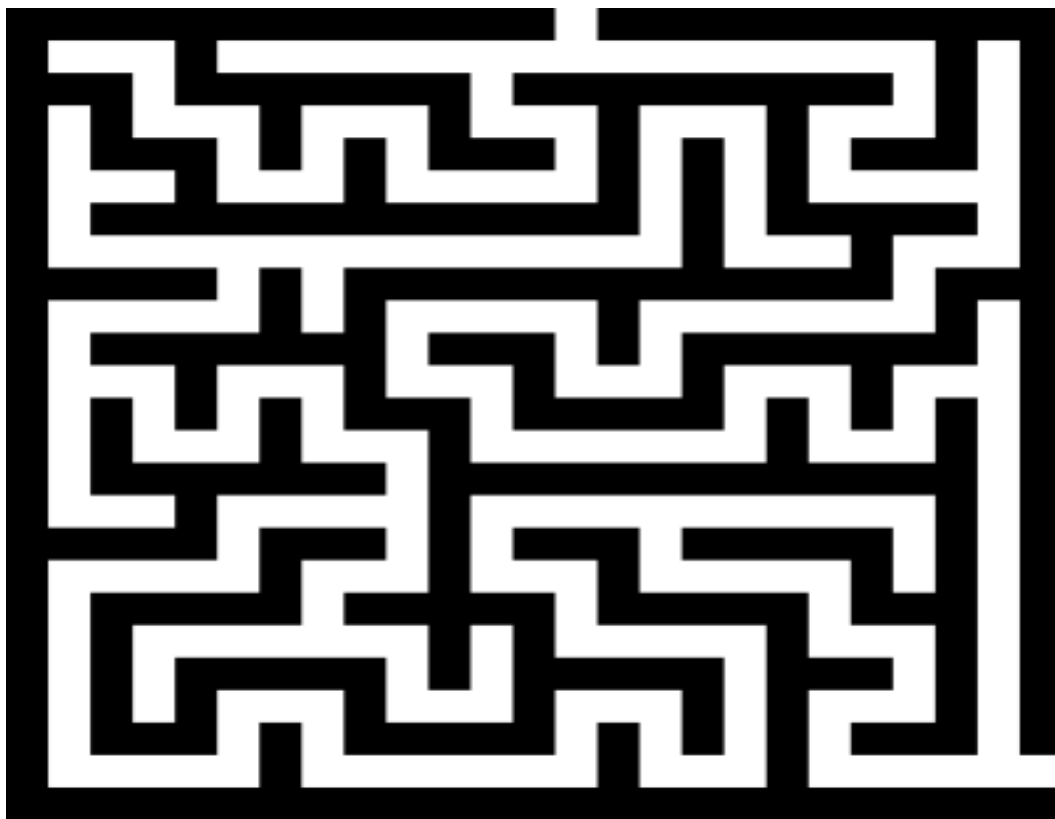
1. People
2. Japan
3. Chair
4. Flower
5. Black

**Appendix E**

Form B.

1. Tirnse
2. Lifna
3. Hisd
4. Tcrou
5. Aetng

Start



Finish

**Appendix F**

Form B. Anagram Answers

1. Insert
2. Final
3. Dish
4. Court
5. Agent



**Appendix G**

## Informed Consent Form

I, \_\_\_\_\_ (print name), understand that I will be taking part in a research project that requires me to complete a short exercise that may require me to participate in a set of anagrams, and mazes while listening to classical music and to participate in a brief experiment that involves timing the experiment. I understand that I should be able to complete this project within 3 minutes. I am aware that my participation in this study is strictly voluntary and that I may choose to withdraw from the study at any time without any penalty or prejudice. I understand that to the best of my knowledge, I will not suffer any adverse effects from engaging in these types of tasks that were mentioned above. I should not incur any penalty or prejudice because I cannot complete the study. I understand that the information obtained from my responses will be analyzed only as part of aggregate data and that all identifying information will be absent from the data in order to ensure anonymity. I am also aware that my responses will be kept confidential and that data obtained from this study will only be available for research and educational purposes. I understand that any questions I may have regarding this study shall be answered by the researcher(s) involved to my satisfaction. Finally, I verify that I am at least 18 years of age and am legally able to give consent or that I am under the age of 18 but have on file with the HSP office, a completed parental consent form that allows me to give consent as a minor.

\_\_\_\_\_ Date: \_\_\_\_\_  
 (Signature of participant)

\_\_\_\_\_ Date: \_\_\_\_\_  
 (Signature of researcher obtaining consent)

Student Researchers' Names and Numbers:

Steven Carter  
 Matthew Black  
 Adam Rose

Supervisor:

Dr. Michiko Nohara-LeClair  
 Course Instructor  
 (636)-949-4371  
 mnohara-leclair@lindenwood.edu

## **Appendix H**

### Feedback Letter

Thank you for participating in our study. The study was used in order to understand if classical music would enhance people's concentration in completion of mental tasks. We hypothesized that classical music will help participants accomplish their assigned tasks at a more efficient rate than the participants that were not given music during their experiment. Please note that we are not interested in your individual results; rather, we are only interested in the results of a large group of consumers, of which you are now a part of. No identifying information about you will be associated with any of the findings.

If you have any questions or concerns regarding any portion of this study, please do not hesitate to bring them up now or in the future. Our contact information is found at the bottom of this letter. If you are interested in obtaining a summary of the findings of this study at a later date, please contact us and we will make it available to you at the completion of this project.

Thank you again for your valuable contribution to this study.

Sincerely,

Principal Investigators:

Steven Carter  
Matthew Black  
Adam Rose

Supervisor:

Dr. Michiko Nohara-LeClair 636-949-4371 ([mnohara-leclair@lindenwood.edu](mailto:mnohara-leclair@lindenwood.edu))

**Encoding Specificity: Applied to Communication Patterns in Recall Processes****Makandal P. Daaga**

*This study investigated the concept of encoding specificity and attempted to apply it to communication patterns and memory. The hypothesis stated that similar forms of communication during encoding and recall would lead to improved recall performance. Forty undergraduate students were recruited to participate in two free recall trials where the modality of communication (visual vs. auditory) was manipulated to test the hypothesis. Participants were presented with two word lists (15 words each) either via visually (visual) or via audio recording (auditory) and asked to recall either via writing (visual) or speaking (auditory). Trials involving similar forms of communication displayed significantly higher scores than dissimilar ones.*

Encoding specificity indicates that consistent and similar factors occurring during encoding (process of how items are placed into memory) and retrieval (process of how items are recovered from memory) should have a positive effect on recall performance. Working memory is the "active maintenance of a limited amount of ... information so it is available for use" (Sayala, Sala, Courtney 1). The present study attempts to demonstrate this effect by manipulating the communication patterns during two free recall trials. Ray and Reingold attempted to demonstrate perceptual specificity effects in a study involving natural scenes (Ray, Reingold 2003). Curan, Schacter and Bessenoff manipulated encoding tasks to "gain insight into the determinants of perceptual specificity effects on visual word-stem completion". Similar patterns of communication during encoding and retrieval (visual-visual, auditory-auditory) should therefore be more effective than dissimilar patterns (visual-

auditory, auditory-visual). Participants were asked to memorize two lists of words presented in either visual form (via power point) or in auditory form (via audio recording) and then recall the words either in visual form (via writing) or in auditory form (via speaking). The semantic and phonological complexity of the words used was limited to limit the effects on recall performance. The word length effect is the finding that a list of items that take less time to pronounce is better recalled on an immediate recall test than an otherwise equivalent list of items that take more time to pronounce (Bireta, Neath & Surpenant). Hannon and Craik also investigated the effects of the semantic characteristics of words on memory using (Hannon, Craik 2001).

## **Method**

### *Participants*

Forty (21 male, 19 female) college-age students were recruited from the Human Subject Pool at Lindenwood University. Participants were recruited via a sign up sheet that was posted outside of the HSP office. Compensation was given in the form of extra credit points toward General Education classes in the Social Sciences Department.

### *Materials*

The room was furnished with two chairs and a computer desk. A questionnaire was given to participants before the trials and a computer was used to show power-point presentations and play audio recordings.

### *Procedure*

Participants were first given a questionnaire requesting demographic and other data relevant to the study. They were then randomly assigned to either the visual group or the auditory group. Participants in the visual group were shown two power-point presentations of

two separate word lists, the words being displayed in one second intervals. They were asked after each trial to recall as many words as possible, either by telling the researcher (auditory method) or by writing (visual method). The order of this was alternated to counterbalance for order effects. Participants in the auditory group were asked to listen to two audio recordings of the same two lists of words. They were asked after each trial to recall as many words as possible either by telling the researcher (auditory method) or by writing it down (visual method). The order of this was counterbalanced as well. The purpose and rationale was then explained to the participants who also received a feedback letter.

### **Results**

Main effect of test  $F(1, 38) = 14.721, p < .001$

Main effect of Modality  $F(1, 38) = 1.475, p > .05$

Interaction  $F(1, 38) = .497, p > .05$

Similar Communication forms Mean = 6.30

Dissimilar Communication forms Mean = 5.08

### **Discussion**

The effect of encoding specificity was demonstrated by the superior performance of participants in matched trials as opposed to mismatched trials. The hypothesis was supported as the difference between the scores involving similar and dissimilar forms of communications was found to be significant. Interestingly, trials involving visual encoding demonstrated a bigger difference between matched and mismatched forms of communication than trials involving auditory encoding. This study could have implications on learning and testing methods in academic and other settings. One concern of the study is the distress felt by participants who scored lowly on the free recall trials. Since none of the participants

recalled more than nine words on any trial, a future replication could use ten words per list instead to reduce subjective participant distress.

### References

- Bireta, J. T., Neath, I., & Surprenant A M (2006). The syllable-based word length effect and stimulus set specificity. *Psychonomic Bulletin & Review*, *13*, 434-439
- Sayala, S. . Sala, B.J., & Courtney, M. (2006). Increased Neural Efficiency with Repeated Performance of a Working Memory Task is Information-type Dependent *Cerebral Cortex*. *16*, (5), 609.
- Ray, C.A., Reingold, E. (2003). Long-term perceptual specificity effects in recognition memory: The transformed pictures paradigm. *Canadian Journal of Experimental Psychology*, *57*(2), 131.
- Hannon, B., & Craik, M.F.. (2001). Encoding specificity revisited: The role of semantics. *Canadian Journal of Experimental Psychology*. *55*, (3), 231.
- Curan, T., Schacter, D. L., & Bessenoff, G. (1996). Visual specificity effects on word stem completion: Beyond transfer appropriate processing? *Canadian Journal of Experimental Psychology*. *50*, (1), 22

## **Racial Stereotyping and Physical Perception of Crime**

**Jenn Malzone**

*A statistical analysis conducted by the United States Department of Justice stated that from 1976 to 2002, a surprisingly large number of murders committed were intra-racial, rather than inter-racial. The results claimed that 86% of Caucasian murder victims were killed by other Caucasians, and 94% of African American victims were killed by other African Americans. The present study was conducted to see if the average person perceives inter-racial crime to be more of a threat. Thirty-seven participants were given the task of assigning photographs of men from the two most prominent ethnic groups in the United States to various negative and positive roles. They were expected to associate photographs of men from their own race with the positive stereotypes, and photographs of men from other races with negative stereotypes. The results, however, were not significant at a level to support the hypothesis, and in some cases, went against the hypothesis.*

It is known by those interested in psychology, sociology, or simply human nature that one's perception of something can be quite different than actual information based on facts. This could be true, for example, in cases of perception of risk or threat. There are many reasons for this dissonance between perception and fact, some of which include false images portrayed by the media or even life experiences. Often, having a skewed perception of some type of issue can be harmful. In a study based on stereotyping associated with the news media, this point is elaborated (Hoffman, 1991). "The news media have the power to be catalysts for positive change in many areas of our culture. Instead, the media often perpetuate stereotyping" (p. 22). Stereotyping begins at a young age, a construct formed



from memories of past experiences being aligned with cultural expectations (Norcross, 1990).

Based on statistics provided by the United States Department of Justice in 2003, a majority of the murders committed between 1976 and 2002 were intra-racial rather than inter-racial. Intra-racial refers to crime committed by a member of a race against another member of his or her own race. Inter-racial, on the other hand, involves a crime between members of different races. According to the Department of Justice, 86% of Caucasians were murdered intra-racially, and 94% of African American murders were also inter-racial. These results would point to the idea that intra-racial crime is much more of a threat than inter-racial. However, I felt that perhaps the general sentiments of Americans were to perceive inter-racial crime as a bigger threat, despite these concrete statistics.

Racial prejudice is an issue that has been studied since the 1940s (Bigler, 1993). The idea of skewed racial perception relates to the topic of xenophobia. Xenophobia is generally referred to as the irrational fear of or hatred towards strangers, foreigners, or anyone who is different. Often these biases are not consciously known; meaning, a person may not purposely be racist, rather he/she simply has an incorrect view of the situation (Winder, 2003). Again, factors such as the media can influence and perpetuate fear of those from other races. Another study on race and media concluded that the media was to blame (Stein, 1994). "The mainstream media's coverage of people of color is riddled with old stereotypes, offensive terminology, biased reporting, and myopic interpretations" (p. 2).

In the present study, the hypothesis was that, when given photos of members of various races and assigned the task of matching photos with negative and positive stereotypical roles, participants would choose members of their own race for the positive

roles, and members of other races for the negative roles. This could be associated with the perception that people from other races present more of a threat, and the belief that inter-racial crime is a bigger problem than intra-racial crime. The results of the study could be socially beneficial, and could provide more information to the public that would contribute to the decline of racism.

## **Method**

### *Participants*

The participants were 16 males and 21 females, ages 17 to 27 (with a mean age of 18). Based on their answers to a demographic survey, two of the participants identified as Asian, 10 identified as African American, 24 identified as Caucasian, and one identified as Hispanic. Seventeen of the participants were undergraduate students recruited from the Lindenwood Human Subject Pool. One student was underage (17), and therefore presented me with a signed copy of a parental consent form prior to taking the experiment.

The Human Subject Pool (HSP) consisted of lower level psychology, anthropology, and sociology students who received extra credit from their professors for participating. They were recruited by a sign up sheet posted on the HSP bulletin board on the 4<sup>th</sup> floor of Young Hall at Lindenwood University. The other 20 participants were recruited from Mokabe's, a coffeehouse located off Grand Avenue in the south city area of St. Louis. These participants were individually approached by me to participate in the study, and were not given compensation. I chose to use participants from these two locations in order to increase diversity. Lindenwood is a conservatively based private university, while Mokabe's is, in contrast, a liberal environment located in a more racially and economically diverse environment.

Experimental sessions were conducted by a female researcher.

### *Materials*

Equipment used in the procedure consisted of a room, a table and chairs, pens, a survey, and the photos used in the experiment. The 16 photos (see Appendix A) contained individual head shots of men of various ages (about 26 to 57 years of age). Five of the men in the photos were African American, and 11 were Caucasian. These numbers were chosen to represent the racial balance of the American population. The pictures were counterbalanced and assigned numbers, with two pictures each on white sheets of paper. The photo backgrounds were controlled to be solid gray, and clothing was controlled to solid black. Five of the Caucasian men had facial hair, as did two of the African American men (facial hair was defined as a prominent mustache or beard that could clearly be viewed in the photo).

Experiments at Lindenwood were conducted in Lab A of the Psychology Lab, located on the basement floor of Young Hall. Experiments at Mokabe's were held in a small private room located in the back of the coffeehouse.

### *Procedure*

Participants were given an Informed Consent Form (see Appendix B) that explained the procedure that would occur. They began the experiment with the knowledge that they would be giving demographic information, as well as completing a task that involved assigning roles. I instructed them to examine 16 counterbalanced photos of men, leading them to believe that out of these sixteen men, there was one real college professor, one real terrorist, drug dealer, bank robber, doctor, and police officer. They were given an answer sheet and told to put down the number of the photo they thought was the real

professor/terrorist/etc next to the role name. They were given as much time as they needed, and were told that they could spread out the photos if need be. They were able to use the same photo twice, but each role name needed to correspond with one numerical answer.

This task was followed by the brief demographic survey asking their age, sex, and race. After completing the survey, the participants were debriefed and told about the study's actual purpose. I informed them that the men in the photos were actually completely random men - this activity was done to see which men they perceived to be associated with the positive or negative stereotypes. It was explained to the participants how this information would be related to feelings about inter/intra racial crime, hoping to demonstrate that the average person's perceptions differ from actual statistics. Finally, it emphasized that the study was being conducted with the hopes of being socially beneficial, but if at any time the participant felt uncomfortable, he/she had a right to withdraw from the study. None of the participants chose to withdraw. Some had further questions, which were answered in full. The study was concluded by giving the participants the feedback letter, which included my contact information.

When analyzing the results, the information from the two participants who identified as Asian, and the one participant who identified as Hispanic was omitted. This was because the men in the 16 photos only included African Americans and Caucasians, so it would be impossible to tell how these three participants viewed men from their own race in comparison.

### **Results**

A chi-square analysis performed on the data concluded that only one role, the terrorist, was statistically significant. The analysis revealed .002, or  $p < .05$ , and actually

went against the hypothesis. The role of the bank robber resulted in .732, or  $p > .05$ , meaning that it was not significant. The role of the college professor resulted in .086, or  $p > .05$ , also not significant. The role of the drug dealer resulted in .303, or  $p > .05$ , not significant. The police officer was .732, or  $p > .05$ , not significant. Finally, the role of the doctor was .303, or  $p > .05$ , and was not significant.

In examining the frequencies in a chi-square test, the role of bank robber was chosen to be someone of the participant's own race 16 times, or 47 percent of the time. It was chosen to be someone of a different race 18 times, or 53 percent. Although this negative role was chosen most often as someone of a race different from the participant, it is not significant enough to support the hypothesis. The role of the college professor was chosen to be someone of the participant's own race 22 times, or 65 percent. It was chosen as a different race 12 times, or 35 percent. This also went with the hypothesis, but was not significant.

The role of the terrorist was picked as someone of the participant's own race 26 times, or 76 percent of the time. A person of another race was picked for the role 8 times, or 24 percent. This was significant, and did not support the hypothesis. The role of the drug dealer was picked as the same race as the participant 20 times, or 59 percent of the time. The opposite was picked 14 times, or 41 percent. This went with the hypothesis, but was not significant. The role of the police officer was picked as the same race 18 times (53 percent), and 16 times for the different race (47 percent). This supported the hypothesis, but was not significant. The role of doctor was picked as the same 20 times (59 percent) and the different 14 times (41 percent). This also supported the hypothesis, but was not significant.

The mode of each specific picture was examined in order to see which pictures were most often chosen for each role. The mode of the bank robber was photograph 16, an African American male that was chosen 8 times, or 24 percent. The mode for the identity of college professor was a three way tie between photograph 15, a Caucasian male, photograph 10, an African American male, and photograph 4, a Caucasian male. Each of these was chosen 8 times, or 24 percent. The mode for the identity of terrorist was photograph 14, a Caucasian male that was chosen 13 times, or 38 percent. The mode chosen for the identity of the drug dealer was photograph 2, an African-American male that was chosen 10 times, or 29 percent. The mode for the identity of police officer was photograph 9, a Caucasian male chosen 11 times, or 32 percent. The mode for the identity of doctor was photograph 10, an African American male chosen 8 times, or 24 percent.

### **Discussion**

While the photos chosen for the positive roles went along with the hypothesis (all three being chosen most often as someone of the participant's own race), the results were not strong enough to be statistically significant. The negative roles ended up going against the hypothesis two out of three times, and only the results of the terrorist were significant (which also went against the hypothesis). These results, while not able to provide any conclusions, are still very interesting and could have multiple explanations.

The choosing of the subjects' own races for two out of three of the negative roles could be demonstrating that the average person perceives people from their own race as threatening. However, there is also the chance that these results occurred because of reverse racism. The process of reverse racism/discrimination can occur when a participant is focusing so heavily on not being racist that he or she will actually do the opposite. This is

something that could perhaps be somewhat controlled for in future studies by an increased number of photos (with men from a wider assortment of racial backgrounds), and with some roles included on the answer sheet that are not as polarized. For example, the roles of salesperson or neighbor could be included to balance out the extreme roles of bank robber and terrorist.

It should also be noted that participants most often chose the photos of men of their own race, regardless of whether the role they were assigning the photo to was negative or positive. This could mean that perhaps people are more likely to choose photos of their own race in general.

Photograph 14, the man chosen as the terrorist, was one of the five Caucasian men with facial hair in the study, and was one of the two with a beard. Photograph 8, the other man with a beard, was chosen as the terrorist six times (18 percent), almost three times more than any of the other photos. This could represent a stereotype that men with facial hair may be more likely to be viewed as terrorists. The news media could be blamed for this stereotype, as they have been criticized for contributing to the perception that a terrorist is often a man of Middle Eastern descent with facial hair.

Further analysis was conducted to see if the race of the participant affected the likelihood of choosing their own race or another race to fit the role. The results demonstrated that there was a difference in the percentages based on race. For the role of the bank robber, 30 percent of African American participants chose someone of their own race, while 70 percent chose the different race. Fifty-four percent of Caucasian participants chose someone of their own race, while 46 percent chose the different race. For the role of the college professor, African Americans chose the same race 70 percent of the time; Caucasians chose

the same 63 percent of the time. For the role of the terrorist, African Americans were split, with 50 percent choosing the same and 50 percent choosing different. Oppositely, 87 percent of Caucasians chose someone of their own race, leaving 13 percent that chose the different race. For the role of the drug dealer, 70 percent of African Americans chose the same race, while 54 percent of Caucasians chose the same race. For the role of the police officer, 70 percent of African Americans chose a different race, while 63 percent of Caucasians chose their own. Finally, 60 percent of African American participants chose someone of a different race for the role of the doctor, while 67 percent of Caucasians chose someone of their own race.

These results are interesting, as it shows that the two racial groups often differed in their responses. However, this could be a result of the lack of participant diversity and an unequal comparison, being that there were more Caucasian participants than African American participants (therefore greater assumptions were being made when analyzing statistics of the African American participants).

Some additional variables could have affected the results. For example, although measures were taken to make each photo uniform, it became necessary to take the photos in a variety of locations, leading to different background colors. Clothing was also attempted to be controlled, and was cropped out of the photo if not black or white. People being photographed were instructed to smile, but this command was obviously interpreted in a variety of ways, resulting in facial expressions that ranged from full smiles to neutral expressions. Finally, the men in the photos were a very wide variety of ages, and in some cases, the exact age was not known.



An increased sample size would most likely lead to more accurate results. It would be beneficial to replicate this study with 100 participants, perhaps with the issue of facial hair controlled for. A separate study examining the role of facial hair would also be worth investigating.

### References

- Bigler, R. & Liben, L. (1993). A cognitive-developmental approach to racial stereotyping and reconstructive memory in Euro-American children. *Child Development, 64*, 1507-1518.
- Blair, B., Judd, C., & Chapleau, K. (2004). The influence of afrocentric facial features in criminal sentencing. *Psychological Science, 15*, 674-679.
- Brezina, T. & Winder, K. (2003). Economic disadvantage, status generalization, and negative racial stereotyping by white Americans. *Social Psychology Quarterly, 66*, 402-418.
- Hoffman, G. (1991). Racial stereotyping in the news : Some general semantics alternatives. *ETC: A Review of General Semantics, 48*, 22-30.
- Levy, G. (2000). Individual differences in race schematicity as predictors of African American and white children's race-relevant memories and peer preferences. *Journal of Genetic Psychology, 4*, 400-420.
- Norcross, P. (1990). Racial Stereotyping in the all-white private school. *Cambridge Journal of Education, 20*, 29-36.
- Steen, S., Engen, R., & Gainey, R. (2005). Images of danger and culpability: Racial profiling, case processing, and criminal sentencing. *Criminology, 43*, 435-468.
- United States Department of Justice, Bureau of Justice Statistics, *Criminal victimization in the United States, 2002*, Statistics

Stein, M. L. (1994). Racial stereotyping and the media. *Editor & Publisher*, 127, 2-14.

**Appendix A**

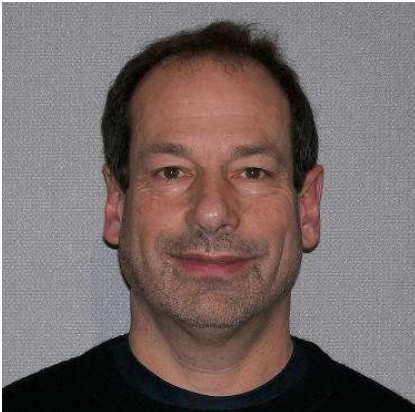
(photos not actual size – made smaller)



Photograph 1



Photograph 2



Photograph 3



Photograph 4



Photograph 5



Photograph 6



Photograph 7



Photograph 8



Photograph 9



Photograph 10



Photograph 11



Photograph 12



Photograph 13



Photograph 14



Photograph 15



Photograph 16



## Appendix B

### Feedback Letter

Thank you for participating in my study. The purpose of this study is to examine sentiments about inter/intra-racial crime. Statistics show that intra-racial crime (crime within people of the same race) occurs more often than inter-racial crime (crime between people of different races). These statistics interested me, as I felt the general sentiment of our society may actually be that inter-racial crime is more of a threat. Therefore the experiment you have completed was conducted to test whether the average person perceives inter-racial or intra-racial crime to be more threatening. The task of assigning photographs containing men of different races was set up in order to see if people tend to attribute those of their own race or different races with positive or negative images.

No negative feelings toward any race are intended to be expressed as a result of this study. If my hypothesis is proven correct, I hope to use the results to be socially beneficial – perhaps helping our society be more tolerant of other races. This also concerns the issue of xenophobia (defined as the tendency of people to fear and think less of those who are a different race). Once people are educated on what xenophobia is and how we subconsciously become victim to it, it may help to rid our society of it.

Please note that I am not interested in your individual results; rather, I am only interested in the results of a large group of consumers, of which you are now a part of. No identifying information about you will be associated with any of the findings.

If you have any questions or concerns regarding any portion of this study, please do not hesitate to bring them up now or in the future. My contact information is found at the bottom of this letter. If you are interested in obtaining a summary of the findings of this study at a later date, please contact me and I will make it available to you at the completion of this project.

Thank you again for your valuable contribution to this study.

Sincerely,

Principal Investigators:  
Jenn Malzone (314) 378-3811

Supervisors:  
Dr. Michiko Nohara-LeClair 636-949-4371 ([mnohara-leclair@lindenwood.edu](mailto:mnohara-leclair@lindenwood.edu))

### Appendix C

#### Informed Consent Form

I, \_\_\_\_\_ (print name), understand that I will be taking part in a research project that requires me to complete a task involving matching pictures with identities. I will also be asked to complete a survey involving a disclosure of sex and race information. I understand that I should be able to complete this project within 15 minutes. I am aware that my participation in this study is strictly voluntary and that I may choose to withdraw from the study at any time without any penalty or prejudice. I should not incur any penalty or prejudice because I cannot complete the study. I understand that the information obtained from my responses will be analyzed only as part of aggregate data and that all identifying information will be absent from the data in order to ensure anonymity. I am also aware that my responses will be kept confidential and that data obtained from this study will only be available for research and educational purposes. I understand that any questions I may have regarding this study shall be answered by the researcher(s) involved to my satisfaction. Finally, I verify that I am at least 18 years of age and am legally able to give consent.

\_\_\_\_\_

Date: \_\_\_\_\_

(Signature of participant)

\_\_\_\_\_

Date: \_\_\_\_\_

(Signature of researcher obtaining consent)

Jenn Malzone (314) 378-3811

Supervisor:

Dr. Michiko Nohara-LeClair  
Course Instructor  
(636)-949-4371  
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**Appendix D**  
**QUESTIONNAIRE**

SUBJECT ID NUMBER: \_\_\_\_\_ (Assigned by Researcher)

1) Are you     MALE     FEMALE     (circle one)

2) Which of the following racial categories taken from the US Census Bureau best describes your racial background?

AMERICAN INDIAN OR ALASKAN NATIVE

ASIAN

AFRICAN AMERICAN

PACIFIC ISLANDER

CAUCASIAN

HISPANIC

OTHER \_\_\_\_\_

3) What is your age? \_\_\_\_\_

## **Appendix E**

### Instructions

After receiving and signed the Informed Consent Form, you will be shown sixteen photographs of men. You will also be given a list of identities. Each identity has one photograph that belongs with it – for example, one of the identities listed is “bank robber,” and there is one photo in the group that actually contains a real bank robber. Your task is to decide which of the photographs contain the people that fit the identities. For example, decide which of the pictures you think is a photo of the real bank robber, then place its number next to the identity “bank robber” on the list. You can use the same photo more than once. All identities on the list need to be filled in.

Following this, please fill out the brief questionnaire.

Thank you.

## Appendix F

### IDENTITIES

Which photograph do you think is of the real:

Bank Robber \_\_\_\_\_

College Professor \_\_\_\_\_

Terrorist \_\_\_\_\_

Drug Dealer \_\_\_\_\_

Police Officer \_\_\_\_\_

Doctor \_\_\_\_\_

Millionaire \_\_\_\_\_

(Place number of photograph next to the correct identity. Guess which photo contains the real bank robber, college professor, terrorist, etc. A photo can be used more than once. Please put a number down for each identity. Choose only one for each identity.)

**Interpersonal Conflict Resolution:****Differences Across Sex and Socially Established Gender****Abby Ramon**

*The purpose of this study was to examine, compare, and contrast how men and women handle conflict in romantic interpersonal relationships. The purpose was also to examine the relationship between people's particular ways of responding and their levels of masculinity and femininity, as measured by a modified version of the Bem Sex Role Inventory. Eighty-two participants between the ages of 18 and 55 were recruited for this study. They were all asked to fill out a personality inventory and two questionnaires, both of which consisted of a hypothetical conflict scenario and questions for the participant to answer. The data were analyzed using a MANOVA, Pearson correlations, and descriptive statistics. The MANOVA yielded non-significant findings, with one approaching significance. The Pearson correlations indicated either no correlation or small correlations.*

Garnering continued research interest is the topic of conflict in interpersonal romantic relationships. Previous research has investigated the extent to which significant differences exist in how men and women approach and handle this type of conflict. Although extensive research has been conducted to explore components of this type of conflict in relation to sex and gender, findings often create further questions for investigation, or they may yield conflicting results (Aylor & Dainton, 2004; Neff & Harter, 2002). In order to understand and be able to maintain healthy relationships, these questions should be investigated. The area of conflict in romantic relationships under investigation in the present study involves conflict resolution and how it may vary according to sex and social gender roles. There were three

parts to the purpose, specifically: to examine differences in the way men and women rate their inclinations to solve a hypothetical, interpersonal romantic conflict scenario; to examine these same differences according to socially established gender, as opposed to a person's biological sex; and to examine individuals reasons for resolving or not resolving conflicts.

Previous research has suggested that women think about and approach conflict differently than men do (Tannen, 1990). As suggested by Tannen (1990), women are more oriented to connectedness and affiliation with others; therefore, conflict is seen as threatening and undesirable. Conversely, conflict for men is likely to be seen as a method for gaining status or demonstrating power; therefore, conflict for men is not as threatening. Following this assertion, one is provided with a good rationale for the first purpose of examining differences in the way men and women approach and handle conflict.

These differences were not only examined across biological sex. The second part of the purpose involved examining these differences across socially established gender in terms of a person's given score of masculinity, as measured by a modified version of the Bem Sex Role Inventory (1971).

As indicated by Aylor and Dainton (2004), current research seems to indicate more and more that differences in maintenance strategies in relationships may be more a function of socially established gender roles than biological sex of a person. This finding is relevant to the present study if we consider that conflict resolution may be a type of maintenance strategy. Therefore, *conflict resolution* might be more a function of socially established gender than biological sex. Thus, the importance of including a measure of femininity and masculinity is highlighted.

In addition to the two parts of the purpose stated above, the third part involved examining, in an open-ended form, individual's reasons for resolving or not resolving conflicts. A study conducted by Neff and Harter (2002) indicated that reasons for resolving and not resolving conflict did not vary significantly according to a person's sex. The researcher of the present study was interested in conducting a similar exploratory investigation to determine the frequencies of the reasons people provided for resolving and not resolving conflict.

Others have also conducted research to examine men and women's responses when faced with a romantic conflict. El-Sheikh, Buckhalt, and Reiter (2000) discussed that women have been found to confront and talk about feelings in conflict, while men tend to withdraw and deny. Conversely, other studies have also found that men may be less avoidant than women (Duane as cited in El-Sheikh et al., 2000) and may use more direct strategies of approaching conflict (Ohbuchi & Baba as cited in El-Sheikh et al., 2000). El-Sheikh et al (2000) found that, in general, conflict had a greater impact on women than men. These conflicting findings illustrate the subjectivity and difficulty in interpreting results in this area of research.

A study conducted by Zuroff and Duncan (1999) also examined men and women's responses to romantic conflict. Zuroff and Duncan examined the relationship between these responses and the self-criticism of individuals and found that, for women but not for men, there was a positive relationship between self-criticism and greater overt hostility displayed during conflict. These findings might suggest that perhaps women tend to confront and talk about feelings more (El-Sheikh et al., 2000) according to their levels of self-criticism.



In regard to the purpose of examining person's inclinations to solve an interpersonal romantic conflict, I expected to find significant differences in the way men and women rated themselves, when faced with a hypothetical scenario, on the following: 1) their inclination to initiate action to solve the conflict, 2) their inclination to let their partner initiate action to solve the conflict, and 3) their indication of how soon they would initiate the action. Because of conflicting previous findings and subjectivity of interpretations, I did not include a specific direction for this hypothesis.

In addition to my expectation of significant differences in the proposed area according to sex, I also expected to find that the same differences would be found according to gender roles, specifically, a person's score on a modified version of the Bem Sex Role Inventory (1971). Furthermore, I expected the differences found across the factor of gender to be stronger than the differences found across the factor of sex.

Finally, my expectations for the findings corresponding to the differences in reasons for resolving and not resolving conflicts were less resolute. Because of previous findings I was uncertain as to how the frequencies of the reasons provided by men would compare to the frequencies of the reasons provided by women.

To carry out the study, participants were asked to fill out demographic questionnaires. Also, to measure the variables of interest according to social gender, participants were asked to fill out a personality inventory which indicated their levels of masculinity. Participants were also asked to read two hypothetical, romantic conflict scenarios for which they would answer questions concerning the variables of interest.

## Method

### *Participants*

Eighty-two participants were recruited for this research study. Forty participants were men and forty-two were women. These persons were volunteers recruited through the Lindenwood University Human Subject Pool and from the Greater St. Charles and St. Louis area. The participants were recruited completely by the researcher and were of different ethnic backgrounds but predominantly Caucasian, 75.6%. The participants were between the ages of 18 and 55. The mode age was 19 years, and the required minimum age was eighteen. Approximately 96% of people had been involved in a romantic relationship before, and 57% of people were involved in romantic relationship at the time they completed the study. Compensation was given to participants recruited through the LU Human Subject Pool in the form of extra credit in their principles classes in the social sciences. Participants recruited outside of the HSP did not receive any tangible compensation for participating in this research study.

### *Materials*

A Demographic Questionnaire (Appendix A) was used to gain some general information about the people participating in this study. The questionnaire consisted of five questions for which participants voluntarily denoted sex, age, ethnic background, whether they had ever been involved in a romantic relationship, and whether they were currently involved in a romantic relationship.

A personality inventory (Appendix B) was also used, consisting of 30 personality characteristics on which participants were asked to rate themselves on a scale of 1 (never or almost never true) to 7 (almost always true). This personality inventory was a modified

version of the Bem Sex Role Inventory. The inventory was modified for length purposes. The original inventory contains 60 items total, which was considered too lengthy for this study. The personality characteristics included characteristics that are typically deemed more feminine and characteristics that are typically deemed more masculine. The inventory also included characteristics that are considered to be neutral.

The study was conducted in a lab room for participants recruited through the Lindenwood Human Subject Pool. For participants recruited outside the Lindenwood HSP, the study was conducted in public places in the Greater St. Charles and St. Louis area.

Each participant was given two hypothetical interpersonal romantic conflict scenarios (Appendix C). The order in which scenarios 1 and 2 were given to participants were alternated for every participant to counterbalance for any order effects. Conflict Scenario One consisted of a hypothetical interpersonal romantic conflict situation at the top of the page. Below were five questions asking participants to either rate their given behavior of the question or to write an open-ended response on their given behavior of the question. Conflict Scenario Two consisted of a different hypothetical interpersonal romantic conflict situation from scenario one at the top of the page. The questions below Conflict Scenario Two were the same as for Conflict Scenario One. The conflict scenarios constructed were not standardized, but rather created by the researcher. Both scenarios involved mildly serious situations possible of being encountered in everyday life.

### *Procedure*

Each participant was tested individually or in small groups of no more than five people. The procedure took approximately 10 to 15 minutes. Informed consent was obtained from the participant by the researcher using an Informed Consent Form that both the

researcher and participant signed. The researcher handed the participant a Demographic Questionnaire (Appendix A) and asked him or her to answer all the questions voluntarily as he or she chose. When the participant was done, the researcher collected the questionnaire. The researcher then handed the participant the Personality Inventory (Appendix B) and asked him or her to rate him or herself on each item 1-7 (1 being “never” or “almost never true” and 7 being “almost always true”). When the participant was done with the inventory, the researcher collected it and handed him or her one of the Conflict Scenarios, the order of which was counterbalanced. The participant was instructed to read the hypothetical scenario at the top of the page and then answer the five questions that followed. The researcher then reiterated to the participants that they were not at all obligated to answer any questions with which they did not feel comfortable or did not want to answer. When the participant was done with the first Conflict Scenario, the researcher collected it and handed the participant second Conflict Scenario. The order in which the scenarios were given to the participants alternated with every participant. The researcher told the participant that the instructions were the same. When the participant was done with the second Conflict Scenario, the researcher collected it. The researcher then handed the participant a Feedback Letter informing him or her of the rationale and purpose of the study, while also explaining these items verbally. The researcher then answered any questions the participants had. Finally, the researcher thanked the participant for his or her contribution and informed him or her that the procedure was complete.

### **Results**

The data were analyzed using a one-way Multivariate Analysis of Variance (MANOVA), Pearson Correlations, and descriptive methods. The one-way MANOVA was

used to analyze the potential differences in men and women's ratings of their inclinations to solve conflict. In other words, the MANOVA was used to analyze the variables of interest according to biological sex. A Pearson correlation was used to analyze the relationship between individuals' scores of masculinity and their ratings of their inclinations to solve conflict. Thus, the Pearson correlations were used to examine the variables of interest across socially established gender. A content analysis and descriptive statistics were used to analyze the reasons given for resolving and not resolving conflicts.

#### *Differences Across Sex*

A one-way MANOVA indicated that there was no significant sex difference in the way men and women rated their inclinations to solve conflict. Therefore, this finding did not support the research hypothesis. Specifically, there were no significant differences in the following: peoples' inclinations to initiate action to solve conflict, their inclinations to let their partner initiate the action, and how soon they would initiate action  $F(6, 70) = 1.507, p = .189$ . There did appear to be a component of this that seemed to approach significance. The mean for women's ratings of how soon they would initiate action,  $M = 2.85$ , might indicate a greater urgency to initiate action than the mean for men,  $M = 4.42$ . The ratings were on a scale of 1-10, with the lower the rating, the greater the urgency indicated.

#### *Differences Across Socially Established Gender*

In order to determine a person's socially established gender according to his or her level of masculinity, their ratings on the personality inventory (Appendix B) for both masculine traits and feminine traits were totaled. The ratings were on a scale of 1 – 7. For pragmatic reasons, the order of the numbers on the scale for feminine traits was reversed to

allow the researcher to give participants one composite score rather than two different scores. These scores for socially established gender were on a continuous scale.

Pearson correlations indicated that there was either virtually no correlation or a small correlation between peoples' socially established genders and their inclinations to solve conflict. Again, the research hypothesis was not substantially supported. For scenario 1, the correlation between level of masculinity and rating of initiating action was  $r = -.007$ ; the correlation between level of masculinity and rating of letting partner initiate the action was  $r = .169$ ; the correlation between level of masculinity and how soon one would initiate the action was  $r = -.005$ . For scenario 2, the correlation between level of masculinity and rating of initiating action was  $r = .074$ ; the correlation between level of masculinity and rating of letting partner initiate the action was  $r = .053$ ; the correlation between level of masculinity and rating of how soon one would initiate the action was  $r = .024$ .

#### *Reasons For Resolving and Not Resolving*

The reasons given for resolving and not resolving conflicts were about the same for men and women. For choosing to resolve the conflict, the reasons were placed in one of the following categories: blank or uncodable, personal concern, concern for other, relationship concern, or other. For choosing not to resolve the conflict, the reasons were placed in one of the following categories: blank or uncodable, low importance, personal concern, concern for other, relationship concern, avoid conflict or confrontation, or other. Each scenario asked participants to give their reasons for resolving and not resolving. Therefore, for each participant there were four answers that needed to be content analyzed and put into the corresponding categories.

In scenario 1, for choosing to resolve conflict, the most frequent reason was relationship concern for both men, 42.5%, and women, 35.7%. The second most frequent reason for choosing to resolve was personal concern for both men, 25%, and women, 26.2%. In scenario 1, for choosing *not* to resolve, the most frequent reason was blank or uncodable for both men, 37.5%, and women, 33.3%. The second most frequent reason for men was low importance, 22.5%. The second most frequent reason for women was personal concern, 21.4%.

In scenario 2, for choosing to resolve conflict, the most frequent reason was personal concern for both men, 35%, and women, 42.9%. The second most frequent reason for men was blank or uncodable, 30%. The second most frequent reason for women was relationship concern, 33.3%. Also in scenario 2, for choosing *not* to resolve conflict, the most frequent reason for men was low importance, 32.5%. The most frequent reason for women was blank or uncodable, 35.7%. The second most frequent reason for both men and women was the reverse of the previous. That is, for men, the second most frequent reason was blank or uncodable, 30%, and the second most frequent reason for women was low importance, 23.8%.

### **Discussion**

The findings of this research study did not support the expectations of the researcher in that there would be significant differences in the way men and women handle interpersonal romantic conflict. The findings suggest that perhaps the way people handle interpersonal romantic conflict may not depend on whether that person is a man or a woman. The one component that seemed to approach significance involved how soon a person would initiate action, with women reporting a greater urgency. One might speculate that an

increased sample size might have resulted in this finding being significant. If such was the case, then one conclusion that could be reached would be that women will typically initiate action to resolve a conflict sooner than men will. These findings could be explained in the context of Tannen's writings (1990). If women reported a greater urgency to resolve conflict, this could be because women are more oriented to stay connected and affiliated with others. But, this could also contradict literature that states that women are more avoidant than men when it comes to conflict (Duane as cited in El-Sheikh et al., 2000). The non-significant findings for the first hypothesis could also have been partially due to unanticipated ambiguities in the survey questions or the scale of measurement. Perhaps if a different scale was used, it would have been easier for participants to determine what level of a given rating corresponded to what number.

The findings for the second hypothesis (differences across socially established gender) suggest that the way people handle interpersonal romantic conflict does not depend on peoples' levels of masculinity. Thus, the responses given by those low, average, and high in masculinity vary equally when compared to each other. This finding contradicts that of previous research conducted by Aylor and Dainton (2004). The reason for this contradictory finding might involve the measurement used to determine participants' levels of masculinity. The modified version of the Bem Sex Role Inventory might not have been adequate and valid enough to capture a true score of masculinity. The Bem Sex Role Inventory has also received substantial criticism over time since its introduction; therefore, in future studies it would be wise to use a measure that is less criticized to be adequately reliable and valid.

Although there were mainly no correlations between levels of masculinity and how people handled conflict, there was a small positive correlation between level of masculinity



and the rating of letting one's partner initiate action, indicating that the more masculine an individual was, the more they were likely to let their partner initiate the action to resolve the conflict. These results possibly contradict previous findings that suggest men are less avoidant about conflict and that they are more likely than women to use more direct strategies of resolving (Duane as cited in El-Sheikh et al., 2000), as opposed to passive ways of resolving as found by the present study.

The findings for the reasons given concerning resolving and not resolving conflict also indicated that men and women's responses varied about equally when compared to each other. This finding yielded similar results to the study conducted by Neff and Harter (2002), which also found no significant differences for reasons given across sex. For future studies, it would be a good extension to examine reasons across socially established gender. This examination was attempted in this study not to examine a specific purpose or hypothesis, but because of a concomitant interest from the other findings. An interesting finding was that for one of the scenarios, for choosing not to resolve the conflict, individuals high in masculinity were more likely to give reasons that fell into the low importance category than were individuals of low masculinity.

It is important to be aware of the limitations existing in the present study when considering the results. One of the unanticipated limitations of the present study involved ambiguity of some of the survey questions. Other limitations included an inherent difficulty in interpreting the subjective findings that are involved in this area of research and the use of only one rater to classify reasons into categories. Pilot testing of the questionnaires to ensure that they are sensitive enough to capture any differences and the use of several raters for content analyses would be important to add to future studies. As highlighted by much

research, the area of interpersonal romantic conflict is one that is prevalent in all societies and transcends all cultures. Therefore, it is important to continue research in this area.

### References

- Aylor, B., & Dainton, M. (2004). Biological sex and psychological gender as predictors of routine and strategic relational maintenance. *Sex Roles*, 50.
- El-Sheikh, M., Buckhalt, J., & Reiter, S. (2000). Gender-related effects in emotional responding to resolved and unresolved interpersonal conflict. *Sex Roles*, 43.
- Neff, K., & Harter, S. (2002). The authenticity of conflict resolutions among adult couples: Does women's other-oriented behavior reflect their true selves? *Sex Roles*, 47.
- Tannen, D. (1990). *You just don't understand: Women and men in conversation*. New York, NY: Ballantine Books.
- Zuroff, D., & Duncan, N. (1999). Self-criticism and conflict resolution in romantic couples. *Canadian Journal of Behavioural Science*, 31.

## Appendix A

### Demographic Questionnaire for Conflict Resolution

1. Age:

2. Sex: (circle one) male    female

3. Ethnic background:   circle

American Indian or Alaska Native

Hispanic or Latino

Asian

White

Black or African American

Native Hawaiian or Pacific Islander

Other:

4. Have you ever been involved in a romantic relationship? (circle one)

yes            no            not sure

5. Are you currently involved in a romantic relationship? (circle one)

yes            no            not sure

## Appendix B

### Personality Inventory

Rate yourself on each item, on a scale of 1 (never or almost never true) to 7 (almost always true).

1. self-reliant	1	2	3	4	5	6	7
2. yielding	1	2	3	4	5	6	7
3. helpful	1	2	3	4	5	6	7
4. defends own beliefs	1	2	3	4	5	6	7
5. cheerful	1	2	3	4	5	6	7
6. moody	1	2	3	4	5	6	7
7. independent	1	2	3	4	5	6	7
8. shy	1	2	3	4	5	6	7
9. conscientious	1	2	3	4	5	6	7
10. athletic	1	2	3	4	5	6	7
11. affectionate	1	2	3	4	5	6	7
12. theatrical	1	2	3	4	5	6	7
13. assertive	1	2	3	4	5	6	7
14. flatterable	1	2	3	4	5	6	7
15. happy	1	2	3	4	5	6	7
16. strong personality	1	2	3	4	5	6	7
17. loyal	1	2	3	4	5	6	7
18. unpredictable	1	2	3	4	5	6	7
19. forceful	1	2	3	4	5	6	7
20. feminine	1	2	3	4	5	6	7
21. reliable	1	2	3	4	5	6	7
22. analytical	1	2	3	4	5	6	7
23. sympathetic	1	2	3	4	5	6	7
24. jealous	1	2	3	4	5	6	7
25. leadership ability	1	2	3	4	5	6	7
26. sensitive to others' needs	1	2	3	4	5	6	7
27. truthful	1	2	3	4	5	6	7
28. willing to take risks	1	2	3	4	5	6	7
29. understanding	1	2	3	4	5	6	7
30. secretive	1	2	3	4	5	6	7

### Appendix C

#### Conflict Scenario # 1

Suppose you are one of the people in a romantic relationship. You have a very good friend with whom you like to spend a lot of time. Your friend is with you some of the time that you are also with your partner. Your partner expresses to you that he or she thinks your friend is around too much when it should be time just for the two of you (you and your partner). You do not agree with him or her and the two of you argue about the matter. You end the argument on unresolved terms.

- A. On a scale of 1-10, indicate how much you would be inclined to initiate action to resolve this conflict (1 being very inclined and 10 being very disinclined).

1 2 3 4 5 6 7 8 9 10

- B. On a scale of 1-10, indicate how much you would be inclined to let the other person involved initiate action to resolve this conflict (1 being very inclined and 10 being very un-inclined).

1 2 3 4 5 6 7 8 9 10

- C. On a scale of 1-10, indicate how soon you would initiate action to resolve this conflict (1 being very soon and 10 being as late as possible).

1 2 3 4 5 6 7 8 9 10 Check here if you would not initiate action \_\_\_\_-

- D. If you were to choose to resolve this conflict, what would be your reasoning?

- E. If you were to choose not to resolve this conflict, what would be your reasoning?

- F. On a scale of 1-10, indicate how serious you were imagining this conflict to be (1 being very serious and 10 being not serious at all).

1 2 3 4 5 6 7 8 9 10

Conflict Scenario #2

Suppose you are one of the people in a romantic relationship. You and your significant other have scheduled a dinner date for the evening for 6:30pm. Your partner arrives 10 minutes late at your meeting place and does not provide any reasons as to why. Your partner has done this a few times before. You become bothered by the situation and comment on the fact. Your partner does not agree with you for being bothered by the situation, and you argue about the matter. You end the argument on unresolved terms.

- A. On a scale of 1-10, indicate how much you would be inclined to initiate action to resolve this conflict (1 being very inclined and 10 being very un-inclined).

1 2 3 4 5 6 7 8 9 10

- B. On a scale of 1-10, indicate how much you would be inclined to let the other person involved initiate action to resolve this conflict (1 being very inclined and 10 being very un-inclined).

1 2 3 4 5 6 7 8 9 10

- C. On a scale of 1-10, indicate how soon you would initiate action to resolve this conflict (1 being very soon and 10 being as late as possible).

1 2 3 4 5 6 7 8 9 10 Check here if you would not initiate action \_\_\_\_-

- D. If you were to choose to resolve this conflict what would be your reasoning?

- E. If you were to choose not to resolve this conflict, what would be your reasoning?

- F. On a scale of 1-10, indicate how serious you were imagining this conflict to be (1 being very serious and 10 being not serious at all).

1 2 3 4 5 6 7 8 9 10

**The Sexual Image of Women in Television:****The Effect on Young Women in America****Amanda Reed and Rachel Rogers**

*The purpose of this study was to look at the portrayal of the sexual image of women on television from 1970 through 2000 by rating the main female character on an appearance and communication score, which was done by the two experimenters. We hypothesized that the stereotypical appearance and communication score would increase from 1970 to 2000. However, the trend analysis showed that the appearance score decreased, implying that the stereotypical appearance of women has lessened through the years. The communication score increased from 1980 to 2000, implying a more stereotypical portrayal of women. If future, more thorough research finds the same communication trend, then this could potentially imply that adolescent women's self-esteem is negatively affected by the media.*

“Self-esteem is defined as an individual's global positive or negative attitude toward him or herself” (Bush, Simmons, Hutchinson, & Blyth, 1977, p.463).

The media has had an increasingly important role over the last few decades in the lives of adolescents. Teenagers have been exposed to more media through the advancement of technology such as Internet, cable television, and a greater distribution of magazines and other printed materials. These forms of media have played a large role in the self-concept of many teenagers, especially young women. The following studies have shown that an increased amount of exposure to television sit-coms for young females has a negative impact on their self-esteem.



The purpose of this study was to show the influence of changing gender roles in the media, and how that change affects young women in America. We wanted to know if the negative sexual image of women portrayed in the media is related to a lower self-esteem rate of young girls. We believe that the image of women in television has changed over the last fifty years. While opportunities have increased for women in the media, our hypothesis is that the negative sexual image of women has also increased.

Society's attitudes towards young women that are portrayed in the media can have a large effect on a young girl's self-esteem (Galambos, Peterson, Richards, & Gitelson, 1985). Gerbner, Gross, Morgan, and Signorielli (1994) came up with the term cultivation theory to describe how repeated exposure to television shows can lead viewers to adopt the situations as a reality. From this we can gather that if a young girl were to repeatedly view a certain situational comedy, she would begin to think of this as its own reality, possibly causing her to compare herself to the other female characters. According to Galambos et al., women tend to base their self-concept on society's attitudes about their gender. In a study by Harter (1999), the link between positive perceived appearance and self-esteem had a correlation of .65 in the United States among adolescents. According to Champion and Furnham (1999), self-esteem can either come from an internal or a societal ideal; however, both actually result from what society's attitude is about the perfect physique.

Festinger's social comparison theory says that people tend to compare themselves to others either by downward or upward comparisons (as cited in Morrison, Kalin, & Morrison, 2004). For example, some people look to the wealthy for style trends and feel badly about him or herself because one cannot afford the name brands. However, another person may choose instead to look at how little poorer people have, and feel better about him or herself.

Downward comparisons usually produce high self-esteem and upward comparisons usually produce low self-esteem (Morrison, Kalin, & Morrison, 2004). A study by Morrison et al. found that socially comparing oneself to celebrities such as found in television and magazines had a negative impact on the self-esteem of adolescent girls. Therefore, it is important to see how women are being portrayed in the media.

The concept of the self-esteem of adolescent girls being affected by the media is not a new phenomenon. Studies have concentrated on this topic for years. For this particular study, we focused on the period of the 1960s through 2007. According to a study done in 1977 by Bush et al. young women tended to base their self-worth on interpersonal relationships and how society views those relationships in 1968; however, in 1975, more young women placed value on competence rather than interpersonal relationships.

The ideal woman portrayed by the television media is practically impossible to obtain. A study done in 1986 by Silverstein, Perdue, Peterson, and Kelly found that women in the media on average are thinner than the actual female population. In a study done by Champion and Furnham (1999), 75.9% of women rated their bodies as slightly overweight or obese after viewing images of models on television; however, only 32.6% of these young women were actually overweight. The women portrayed in the media are unrealistic to the point of being unhealthy. Fouts and Burggraf (2000) found that 76% of female characters in television sitcoms were below the average weight of a woman. In the same study done by Fouts and Burggraf, it was shown that negative comments by other characters in the program were directed towards heavier female characters, while the thin idealistic women gained social mobility for their appearance. Wiseman, Gray, Moismann, and Ahrens (1990) also found that many of the female actresses on television were thinner than the criteria for

anorexia. Eggermont, Beullens, and Van Den Bulck (2005) found that during periods in which women in the United States media were the thinnest, such as the 1980s, there was a coinciding epidemic of eating disorders. Eggermont et al. also found that the more time spent watching television, the lower the body satisfaction of adolescent women.

The self-esteem of young adolescent women not only rests on the appearance of female characters in the media, but also their perceived intelligence, such as their education and career choice. Bush et al. (1977) found that while young girls are thinking about their future roles in education as well as occupation, society's attitudes of minimal opportunities may lead these young women to feel negatively about their gender as well as to focus primarily on interpersonal skills rather than occupational goals and aspirations. Galambos et al. (1985) stated that society's traditional attitudes towards women hinder the process of occupational selection because of a preconceived notion of women's roles in society due to a lack of self-esteem felt by adolescent women.

To complete our study, we acted as the sole coders to rate episodes of television programs that were high on Nielsen's rating system from 1960s to present. The Nielsen's rating system is used to determine the composition and size of audiences of specific television programs. We then conducted a trend analysis of the coding data to find the relationship between decades and stereotypical appearance and communication scores.

## **Method**

### *Materials*

The study was held in the researchers' dorm rooms (Blanton and Rauch Memorial) at Lindenwood University. Being an archival study, the experimenters were the only ones involved in data collection. The clips chosen for this project were taken from the following:

The Brady Bunch episode “Brace Yourself” (Radnitz & Rudolph, 1970), Saved by the Bell episode “Breaking up is Hard to Undo” (Sachs & Barnhart, 1989), Friends episode “The Morning After” (Kauffman & Crane, 1997), and Gilmore Girls “The Wedding Bell Blues” (Sherman-Palladino, 2005). We chose these shows based on top five Nielsen ratings for their decade. Each clip was a well-known break-up episode of the programs main characters. Each clip was comparable in length. In the Brady Bunch episode, Marcia gets braces. She believes that she is now ugly, and her fears seem to be confirmed when her boyfriend cancels a date on her. Saved by the Bell is a scene where Zack breaks up with Kelly because she is going to dinner with an ex-boyfriend. Rachel and Ross break up in Friends after Rachel finds out that Ross cheated on her during their 24 hour “break”. In the Gilmore Girls episode, Luke breaks up with Lorelai after her ex-beau Christopher drunkenly humiliates him at Lorelai’s parents’ vow renewal.

Both experimenters acted as coders when viewing episode clips. Experimenters each obtained 4 coding sheets (one for each episode clip viewed) and an ink pen. The coding sheets (see Appendix A) asked for the following information regarding the show each particular clip is of: name of the show, episode number, season number, year episode aired, Nielsen’s rating of the episode. Other information answered on the coding sheets include: facts about the actress (age, height, weight) and facts about what is actually going on in the clip. The experimenters were able to be the only coders for this project because the questions were straightforward (fact-based) and in “circle-what-applies” format. The researchers constructed the questions on the coding sheets based on stereotypical societal viewpoints. Therefore, the researchers were able to discuss what the operational definitions of each item meant. The researchers viewed the clips in random order; not in the order of the decades of

the show. The clips from each series were of a break-up scene with a main female character in the scene and her significant other. The questions regarding what was going on in each clip were about the appearance of the female character involved and the communication styles of the couple (i.e. did he yell when they broke up). The television programs were provided on DVDs and played in a Sony HD DVD player and watched on a Panasonic television.

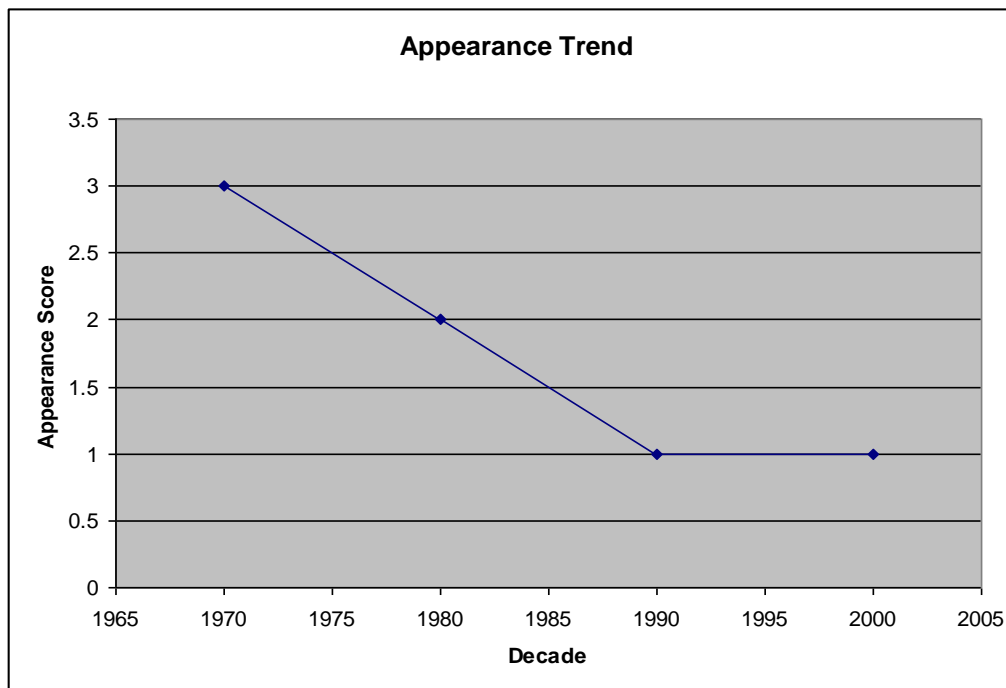
### *Procedure*

First, the researchers independently viewed a clip of an episode from four different situational comedies spanning four decades, each dealing with the break-up of one of the main female characters and her boyfriend: *The Brady Bunch* (“Brace Yourself”, Radnitz & Rudolph, 1970), *Saved by the Bell* (“Breaking up is Hard to Undo”, Sachs & Barnhart, 1989), *Friends* (“The Morning After”, Kauffman & Crane, 1997), and *Gilmore Girls* (“The Wedding Bell Blues”, Sherman-Palladino, 2005). These television shows were chosen based on their high Nielsen’s rating during the time period aired.

While viewing the clips, the researchers completed the coding sheets. The researchers then used the numerical data to quantify the directionality of the image of American women in television. The numerical data was based on an appearance score, which stated whether the actress wore a skirt or pants, sleeves or no sleeves, heels or no heels, and whether or not she showed cleavage in the selected scene. We assigned a score of 1 to each stereotypical element, and a 0 to the non-stereotypical element. Since each element’s score was added, the higher the score, the higher the stereotypical appearance or communication. The trend analysis also used a communication score which consisted of whether or not the female or male character cried, yelled, called one another, begged, or initiated the break-up in the

selected scene. Higher scores represented more stereotypical actions of the female lead character. For a separate trend analysis, the experimenters looked at the age of the character and the age, height, weight, and hair color of the actress. The information about the actresses was simply obtained from the internet at imdb.com.

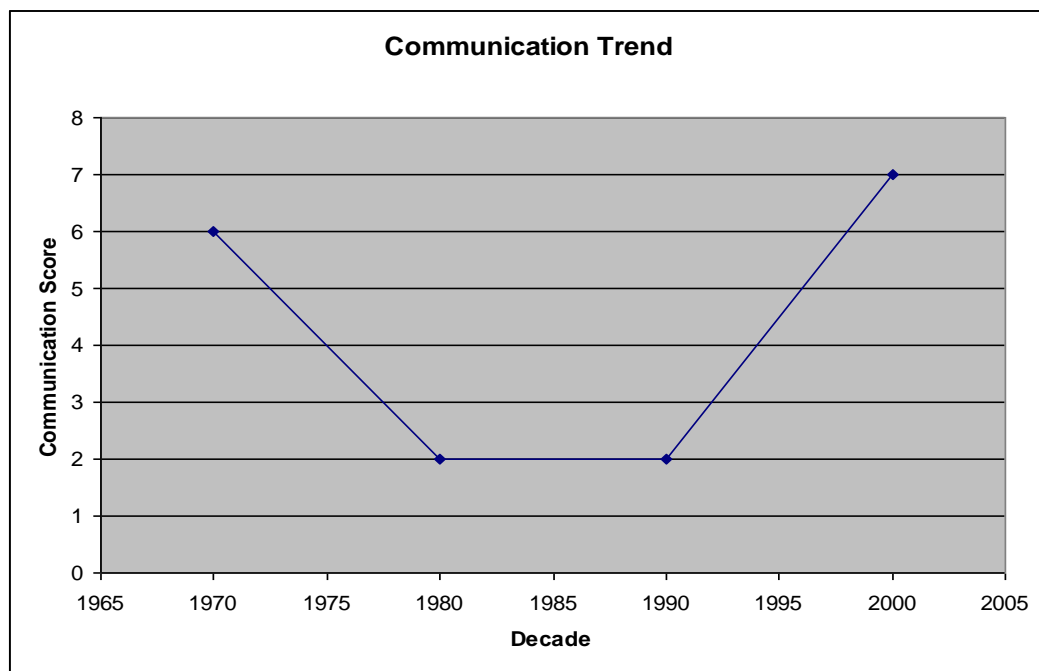
## Results



*Figure 1.* The appearance trend spanning 1970-2000 based on stereotypical appearance scores for the actresses of each decade's episode; where, higher scores mean more stereotypical.

The interrater reliability of this experiment was 100%, so we used only one set of data for the analysis. As shown in Figure 1, the trend analysis shows that the stereotypical female appearance in television has declined from an appearance score of 3 in 1970 to an appearance score of 1 in 2000. The appearance score was compiled of whether the actress wore a skirt or pants, sleeves or no sleeves, heels or no heels, and whether or not she showed cleavage in the selected scene. The trend analysis in Figure 2 showed that the communication score went

from a 6 in 1970 to a 2 in 1980-90, and then increased to a 7 in 2000. The communication score was based on whether or not the female or male character cried, yelled, called one another, begged, or initiated the break-up in the selected scene. The trend analysis also showed that the age of the main actress in the television series increased. The age of the character also increased; however, a majority of the characters were played by older women than the role the actress played. The height of the actresses ranged from 63-69 inches. The weight of the actresses also increased from 1970-2000. Two of the actresses were blondes, and two of the actresses were brunettes.



*Figure 2.* The communication trend spanning 1970-2000 based on stereotypical communication styles.

### Discussion

We hypothesized that sexual image of women in the television media has become more stereotypical in appearance and communication skills with their male counterparts. The trend analysis we conducted showed that the stereotypical appearance for women that is

displayed in television has actually decreased from 1970 to 2000. However, the communication score showed an interesting pattern. In 1970, the stereotypical score for female communication skills was very high (6). It decreased to a 2 in 1980 and 1990, which showed an improvement in the equality of gender roles. However, the television media took a step down. The communication score in 2000 was 7, which was one point higher than in 1970. With further, more in-depth research, this could possibly show that although there was a breakthrough for women in the 1980s and 90s, stereotypes have come back stronger than before regarding women in television.

The age of the actress playing the role increased from 1970 to 2000. We selected television shows that were high on the Nielsen's rating scale at the time they were aired. It seems that older actresses are becoming more popular with the changing times. Because the ages of the actresses increased, the age of the characters did as well. However, it was interesting to note that three of the characters were played by women that were older than the specified age of the role. For example, Maureen McCormick (15) played Marcia Brady (13) in *The Brady Bunch*.

The abovementioned experiments have shown that the more television an adolescent female watches, the lower her self-esteem tends to be. They also showed that the weight of female actresses was below the normal weight range for their height, which made adolescent girls feel inferior to the thinner female actresses because they were trying to obtain an unachievable goal weight. Previous studies stated that because of the social comparison theory, adolescent females compare themselves to actresses on television not only in appearance but also in behaviors such as intelligence and communication skills.



Our study differed from previous research because we found that the stereotypical appearance of women has actually decreased from 1970 instead of increased. This could be due to the fact that we only viewed one television show from each decade, and the selected shows were high on Nielsen's rating system, but that does not necessarily mean that the program is popular with adolescent females. We also found that the weight of the actresses in the programs that were viewed are considered healthy for the height of the actresses. Previous studies had shown that the actresses were too thin for their body type. This could be because of our minimal sample size or the selected programs.

The communication trend that we found showed that the stereotype of female communication skills was very large in 1970, but it decreased greatly from 1980-90; however, in 2000 the score skyrocketed again. If the social comparison theory holds true, it is very dangerous for adolescent females to be viewing these programs because they would then feel that they would have to act dependent upon their male counterparts.

Future studies would benefit from using a larger sample size of television programs across the decades. This would help to ensure that the trend analysis is more reliable. It may also benefit future studies to use participants to either rate the programs or their self-esteem before and after viewing the programs. It may also be interesting for future studies to see if there is a cohort effect in program choices as well as stereotypical material in these selected programs. For example, those that grew up watching the Brady Bunch may have contributed to the success of Gilmore Girls, which could explain our findings in the communication score. It is important to continue this research because the media shapes how adolescent females view themselves, which affects their self-esteem.

### References

- Bush, D.E., Simmons, R.G., Hutchinson, B., & Blyth, D.A.(1977). Adolescent perception of sex- roles in 1968 and 1975. *Public Opinion Quarterly*, 41, 459-474.
- Champion, H. & Furnham, A. (1999). The effect of the media on body satisfaction in adolescent girls. *European Eating Disorders Review*, 7, 213-228.
- Eggermont, S., Beullens, K., & Van Den Bulck, J. (2005). Television viewing and adolescent females' body dissatisfaction: The mediating role of opposite sex expectations. *Communications*, 30, 343-357.
- Fouts, G., & Burrgraf, K. (2000). Television situation comedies: Female weight, male negative comments and audience reactions. *Sex Roles*, 42, 925-935.
- Galambos, L., Peterson, A., Richards, M., & Gitelson, I. (1985). The attitudes toward women scale for adolescents (AWSA): A study of reliability and validity. *Sex Roles*, 13, 343-356.
- Harter, S. (1999). *The constructions of the self: A developmental perspective*. New York: Guilford.
- Internet Movie Database Inc.(1997-2007). Retrieved on March 28, 2007 from [www.imdb.com](http://www.imdb.com).
- Kauffman, M., Crane, D. (Writers) & Burrows, J. (Director). (1997). *The one with the morning after*. In Bright, K.S., Kauffman, M., & Crane, D. (Producers), *Friends*, Burbank: Warner Brothers Studios.
- Morrison, T. G., Kalin, R., & Morrison, M.A. (2004). Body-image evaluation and body-image investment among adolescents: A test of sociocultural and social comparison theories. *Adolescence*, 39, 571-592.

- Radnitz, B. (Writer) & Rudolph, O. (Director). (1970). Brace yourself. In Schwartz, S. (Producer), *The Brady Bunch*, Hollywood: Paramount Studios.
- Sachs, J.J. (Writer) & Barnhart, D. (Director). (1989). Breaking up is hard to undo. In Engel, P. (Producer), *Saved by the Bell*, Los Angeles, NBC.
- Sherman-Palladino, A. (Writer & Director). (2005). Wedding bell blues. In Palmer, F.S. (Producer), *Gilmore Girls*, Burbank: Warner Brothers Studios.
- Silverstein, B., Perdue, L., Peterson, B., & Kelly, E. (1986). The role of the mass media in promoting a thin standard of bodily attractiveness for women. *Sex Roles*, *14*, 519-532.
- Wiseman, C.V., Gray, J.J., Moismann, J.E., & Aherns, A.H. (1990). Cultural expectations of thinness in women: An update. *International Journal of Eating Disorders*, *11*, 85-89.

**Appendix A****Coding Sheet**

Show Series: \_\_\_\_\_

Episode/Season/Year: \_\_\_\_\_

Nielsen's Rating of Show: \_\_\_\_\_

Name of main female character in scene: \_\_\_\_\_

**Information about Actresses:**

- 1) Age of Actress at time she played the role: \_\_\_\_\_
- 2) Age of character (in said episode) the actress plays: \_\_\_\_\_
- 3) Height of Actress: \_\_\_\_\_
- 4) Weight of Actress: \_\_\_\_\_
- 5) Hair color:   Blonde      Brunette      Black      Red      Other: \_\_\_\_\_

**Questions about the clip:** All questions are regarding a break-up scene involving the character listed above and her significant other. Coders understand the intended meanings of the questions.

**Appearance (circle what applies):**

- 1) Wearing:      Skirt              Pants
- 2) Shirt has:    Sleeves            No Sleeves
- 3) Showing Cleavage      No Cleavage
- 4) Wearing Heels            No Heels

**Communication (circle):**

- |                  |                   |               |
|------------------|-------------------|---------------|
| 1) She calls him | He calls her      | No phone call |
| 2) She cries     | She does not cry  |               |
| 3) He cries      | He does not cry   |               |
| 4) He yells      | He does not yell  |               |
| 5) She yells     | She does not yell |               |
| 6) He dumps her  | She dumps him     |               |
| 7) He begs       | He does not beg   |               |
| 8) She begs      | She does not beg  |               |

## **How Preference Plays a Role in Gender and Details**

**Jennifer Anstead and Brittini Martin**

*How preference plays a role in gender and details was examined and evaluated in this experiment. We used Lindenwood University's Human Subject Pool to recruit 30 participants, 16 females and 14 males. Our purpose was to see whether the participants found more differences between the pairs of pictures they preferred over the less preferred pictures. We used gender stereotypical pictures with the hope that participants would prefer the picture that best fits their gender. We did not find statistical significance,  $F(2,58)=2.126$ ,  $p=.129(p<.05)$ , in that the participants discovered more differences in their preferred picture. However, we did find statistical significance between picture type and number correct, and the order the pictures were given and the number correct in each picture.*

The main purpose of our experiment was to determine whether men or women pay more attention to details depending on the subject matter. The rationale of the proposed project was that the investigators believed people pay more attention to things they are interested in based on gender differences. This is important to investigate to determine whether men and women should be separated in classrooms because of their different interests. Thiers (2006) stated in her article that in 2005, the U.S. Department of Education released information about the effects of single-sexed classrooms. The study could have been investigated because of the differences in men and women's preferences in details. Kelley

and Michael (2006) support the concept that men and women learn differently in the classroom. They explain how men and women's brains are different in educational settings.

Baker-Sperry, Behringer, and Grauerholz, (1999) stated that when gender is less exaggerated in gender specific activities, it is less noticed by the public. The stereotypical perceptions of the public begin to become less defined as stereotypical when these pictures are not exaggerated. In the present study, exaggerated pictures were used such as: a male associated picture is in a workshop performing what is perceived as a male stereotypical activity and the female is in a perceived female environment while the neutral picture only consists of animals with no gender based activities.

Cann and Newbern(1984) concluded that when men and women were given pictures of the opposite sex they had more difficulty remembering details of those pictures. If men and women were placed in single sexed schools, the pictures and information given could be directed toward their particular gender. It was shown that men and women remember details differently and having single sexed classrooms could potentially enhance their academic achievement due to this finding. Bauer and Coyne's (1997) experiment also coincides with Cann and Newbern's experiment. They also distributed pictures to children in hopes to find whether the children are consistent between genders when defining stereotypes of a specific sex. In contrast to Cann and Newbern's experiment they did find that when the targets were labeled with the common nouns such as "girl and boy" the findings differed and were reliable.

We believed that due to the gender identification in the pictures, the females would choose the more feminine picture and would perform better by finding more differences in that picture. We also believed that the males would perform better on the masculine picture.

We believed the men and women would perform equally well on the neutral picture. We believe people pay more attention to details when the subject matter is gender specific.

### **Method**

#### *Participants*

The participants were recruited from the Human Subject Pool of Lindenwood University, Missouri. There were 30 undergraduate students, 19 female and 11 male that participated in our study. The participants' ages ranged from 18-25. Each participant received and signed a consent form before participating in the study; they also received compensation of extra credit toward their respective social sciences courses at Lindenwood University for participating in this study. They were also given another extra credit opportunity if they chose not to participate in Human Subject Pool study.

#### *Materials*

The study was conducted in the psychology lab at Lindenwood University. There were three chairs, one for the participant and one for each of the researchers, along with a table to place the papers. A questionnaire was given to the participants after giving them the consent form along with a form that explained the experiment in detail and their compensation form. The questionnaire was for them to fill out before engaging in our three "spot the difference pictures." The questionnaire asked questions such as if they had ever had an experience with spot the difference puzzles, it also included some demographic information about the participants and a short vision test for the participants. This was given to determine whether or not they had any problems with seeing pictures like the ones that were used in our experiment, none of the participants had problems seeing the object that was asked to be pointed to.



The participants were asked to rank the three “spot the difference” pictures that were chosen from [www.comparrot.com](http://www.comparrot.com). The participants ranked the pictures from one to three, one being their favorite and three being their least favorite. The pictures consisted of one neutral scenario (Appendix A) one male (Appendix B) and one female (Appendix C) scenario based on the stereotypes in our society. The pictures were distributed in a counterbalanced order based on their preference. Each participant was given one minute to find the differences in each picture; this was timed by a watch. Once the participants' time was up, we then checked the circled differences the participants chose against an answer key. All of our findings were recorded on a computer.

### *Procedure*

Once the participants entered the room they were asked to read and sign the informed consent form (Appendix D). Next, the participant's receipt was completed and signed so that participants would receive their extra credit. After this was complete, we also explained to the participants the procedure of the experiment and what they would be doing. Each participant was asked to fill out a questionnaire (Appendix E) concerning his or her age, gender, class level, and whether they are visually impaired or not. Each participant was shown the left picture of each pair of pictures at the same time and they were asked to rank them from 1-3, based on their interest in the picture. A rating of one was of most interest to the participants and three was the least. After the participants ranked the order of the pictures, they were given the pictures in a predetermined order. Each person was given a pair of pictures for one minute and told to circle as many differences as they could find on the sheet of paper. We then checked and recorded their correct answers on the computer. Each participant repeated this task for two other pairs of pictures. The pictures were

counterbalanced as shown in Table 1. Once the experiment was over we debriefed the participants and thanked them for participating in our study after they were given the feedback letter with our contact information (Appendix F).

### Results

This experiment looked at whether people found more differences in pairs of pictures based on their preference of the pictures. We thought that they would do best on their favorite picture, second best on their second favorite picture, and worst on their least favorite picture. When we conducted the one-way analysis variance (ANOVA), we did not find any statistical significance between participants' preference in the pictures and the amount of differences they found between the pictures. A total of 30 people were tested and the results showed that the mean number of differences found in the person's favorite picture was 5.47 with a standard deviation of 1.502. The number of differences found in the person's second favorite picture was 5.50 with a standard deviation of 1.614. The mean number of differences found on the person's least favorite picture was 4.77 with a standard deviation of 2.254.

We found no statistical significance in our analysis of picture preference,  $F(2,58)=2.126$ ,  $p=.129$ . Based on our results, 2 girls and 0 boys chose the girl picture as their favorite, 1 girl and 4 boys chose the boy picture as their favorite picture, and 16 girls and 7 boys chose the neutral picture as their favorite. This differs from our hypothesis that girls would prefer the girl picture and boys would prefer the boy picture. There was no statistical significance in this analysis.

However, we did find statistical significance in practice effect,  $F(2,58)=4.479$ ,  $p=.016$  ( $p<.05$ ). People found the most differences in the third picture which shows that they got better with practice. Also, when analyzing picture type (choosing one picture more often than

the others, not based on gender) we found statistical significance  $F(2, 58)=28.711$ ,  $p<.001$  ( $p<.01$ ). There was statistical significance found when comparing the means of each picture. The mean score for the number correct on the boy picture was 6.33, which was statistically higher than the mean for the neutral picture which was 5.30. The mean for the neutral picture was statistically higher than the mean of the girl picture which was 4.10.

### **Discussion**

After analyzing the results, we decided that if we were to conduct this experiment again we would make a couple of changes since statistical significance was not found when we believed significance would be found. Our first change would be the pictures chosen. We chose the male and female picture with an actual human conducting an activity and the neutral picture which consisted of animals. Since the participants chose the neutral picture most often as their favorite, we concluded that we would choose all humans or all animals in the next set of pictures. Perhaps we could choose a more feminine animal for the female (kitten) and a more masculine animal for the males (lion) along with a neutral animal for our neutral picture (giraffe).

We would also choose pictures with the same amount of action taking place, unlike the pictures that were chosen. For example, our female picture had more surrounding items compared to our male picture, which made it a more cluttered, distracting picture. The participants found the least amount of differences in the girl picture which we feel was the most cluttered.

Also, since we did find statistical significance in practice effect we decided that we would have more than three pictures for the participants to complete. We would give them around five pictures and only use the last two or three. We would still counterbalance the

way the pictures were given. Overall we would keep the experiment the same and just change what was stated above.

For further research we feel that it would be convenient to conduct an experiment to determine whether single sexed classrooms have an effect on socialization with the opposite gender. As stated above, Cann and Newbern supported the idea, with their research, that due to the differences between boys and girls in learning and details single sexed classrooms would better their academic achievement. However, this experiment did not discuss how single sexed classrooms would affect the socialization of the children. It is important to determine the positive and negative effects of single sexed schools.

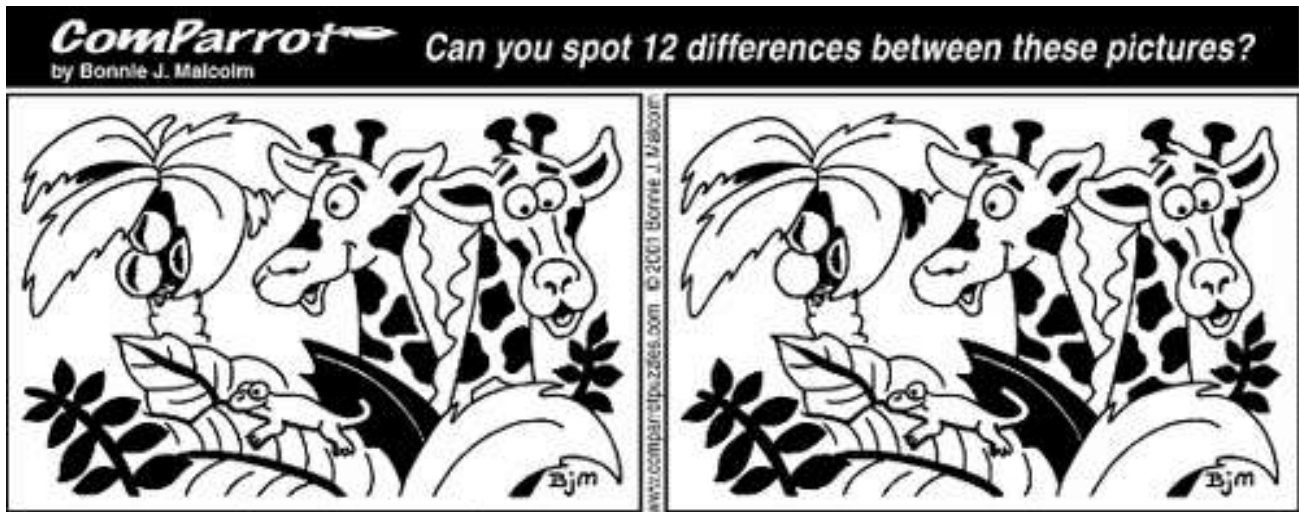
### References

- Baker-Sperry L., Behringer, A., & Grauerholz, L. (1999). Bringing gender to life in the classroom: Recommended videos that teach about gender. *Teaching Sociology, 27, 2*, 193-207.
- Bauer, P., & Coyne, M. (1997). When the name says it all: Preschoolers' recognition and use of the gendered nature of common proper names. *Social Development, 6, 3*, 271-291.
- Cann, A., & Newber, S.R. (1984). Sex stereotype effects in children's picture recognition. *Child Development, 55, 3*, 1085-1090.
- King, K., & Gurian, M. (2006). The brain-his and hers. *Educational Leadership, 64, 1*, 59.
- Thiers, N. (2006). Do single-sex classes raise academic achievement. *Educational Leadership, 63, 7*, 70.

**Table 1**

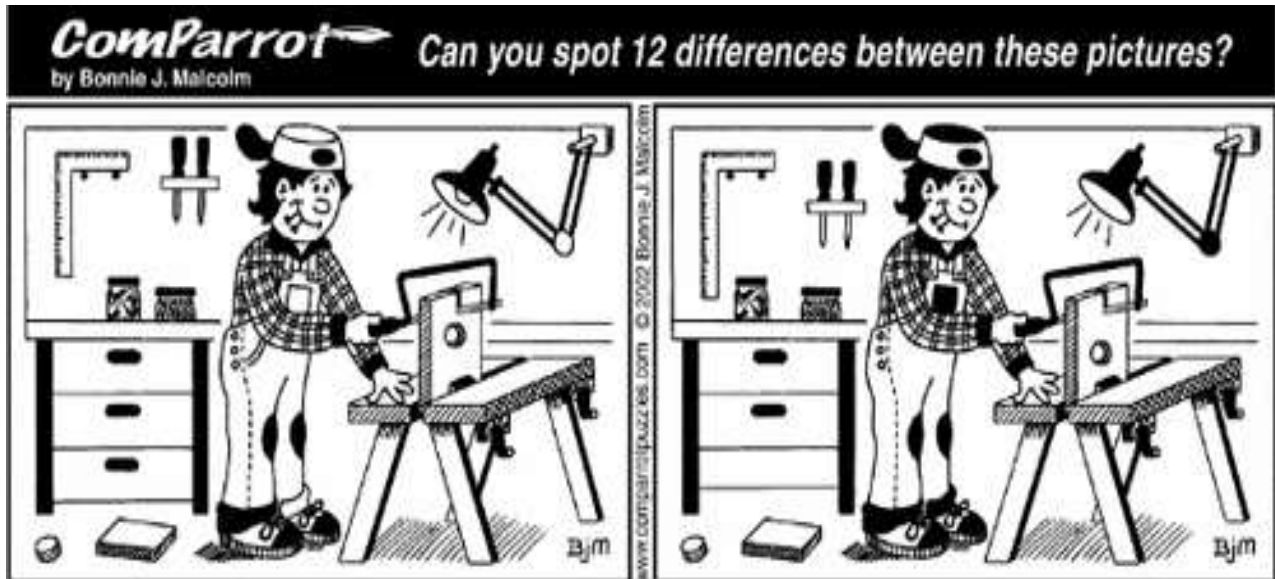
	Trial 1	Trial 2	Trial 3
Participant 1	Favorite	Second	Third
Participant 2	Second	Third	Favorite
Participant 3	Third	Favorite	Second
Participant 4	Favorite	Third	Second
Participant 5	Second	Favorite	Third
Participant 6	Third	Second	Favorite
Repeat up to 24			

Appendix A



Solution: 1. Top tree leaf removed. 2. Nose line on left giraffe removed. 3. Shadow on lower left coconut removed. 4. Leaf vein below gecko removed. 5. Ear line on left giraffe removed. 6. Bottom spot on right giraffe colored in. 7. Small leaf at right of tree colored in. 8. Horn on right giraffe moved. 9. Spot on left giraffe moved. 10. Branch on left side shorter. 11. Gecko tail longer. 12. Gecko eye missing.

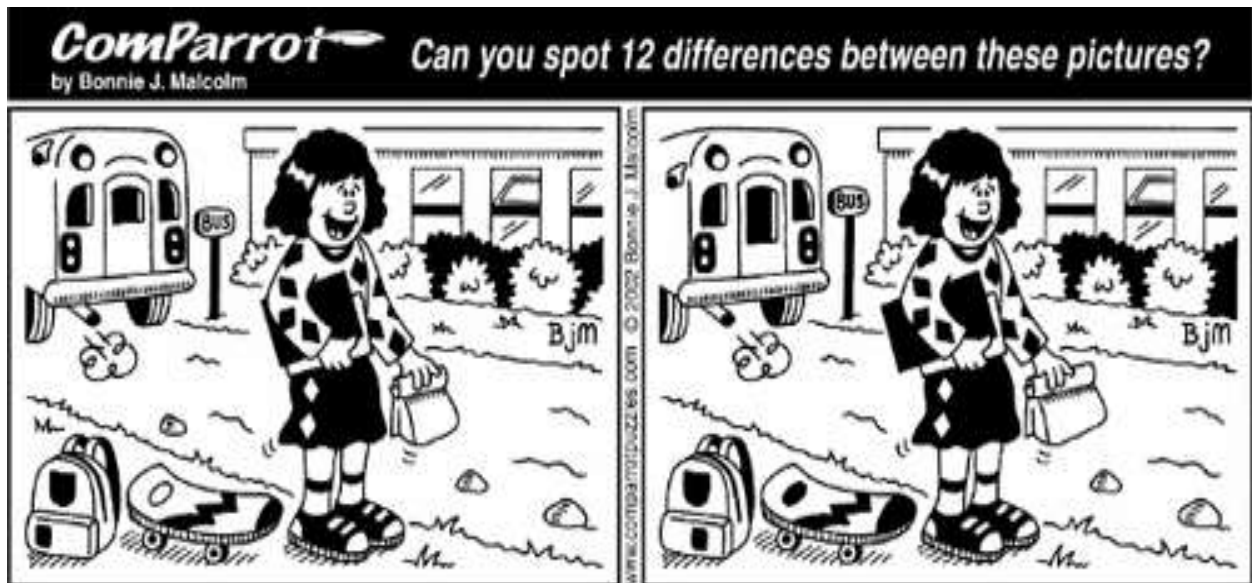
Appendix B



Solution: 1. Carpenter's side pocket is missing. 2. Light bulb in lamp is missing. 3. Drawer handle is missing. 4. Chest pocket is colored in. 5. Top of hat is colored in. 6. Elbow on lamp arm is colored in. 7. Pant cuff is colored in. 8. Hole in board has moved down. 9. Tall jar has moved. 10. Screwdrivers have moved. 11. Bottom drawer is moved. 12. Carpenter square is longer.



### Appendix C



Solution: 1. Tuft of grass by backpack is missing. 2. Rock behind skateboard is missing. 3. Label on skateboard is colored in. 4. Bush on right is colored in. 5. Crest on backpack has moved. 6. Light on bus has moved. 7. Exhaust from bus has moved. 8. Rear window on bus is taller. 9. Pattern on skateboard nose is wider. 10. Folder under girl's arm is wider. 11. Lunch bag is wider. 12. "BUS" sign is taller.

**Appendix D**

## Informed Consent Form

I, \_\_\_\_\_ (print name), understand that I will be taking part in a research project that requires me to complete a short questionnaire asking about my age, gender, grade level and visual ability and participate in a test involving six pictures. I understand that I should be able to complete this project within 15 minutes. I am aware that my participation in this study is strictly voluntary and that I may choose to withdraw from the study at any time without any penalty or prejudice. I should not incur any penalty or prejudice because I cannot complete the study. I understand that the information obtained from my responses will be analyzed only as part of aggregate data and that all identifying information will be absent from the data in order to ensure anonymity. I am also aware that my responses will be kept confidential and that data obtained from this study will only be available for research and educational purposes. I understand that any questions I may have regarding this study shall be answered by the researcher(s) involved to my satisfaction. Finally, I verify that I am at least 18 years of age and am legally able to give consent.

\_\_\_\_\_

Date: \_\_\_\_\_

(Signature of participant)

\_\_\_\_\_

Date: \_\_\_\_\_

(Signature of researcher obtaining consent)

Student Researcher's Name and Number:

Jennifer Anstead (314)610-3009

Brittini Martin (618)841-9222

Supervisor:

Dr. Michiko Nohara-LeClair

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(636)-949-4371

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## Appendix E

### QUESTIONNAIRE

SUBJECT ID NUMBER: \_\_\_\_\_ (Assigned by Researcher)

1) Are you:    MALE                      FEMALE?

2) How old are you? \_\_\_\_\_ years

3) What class are you in?

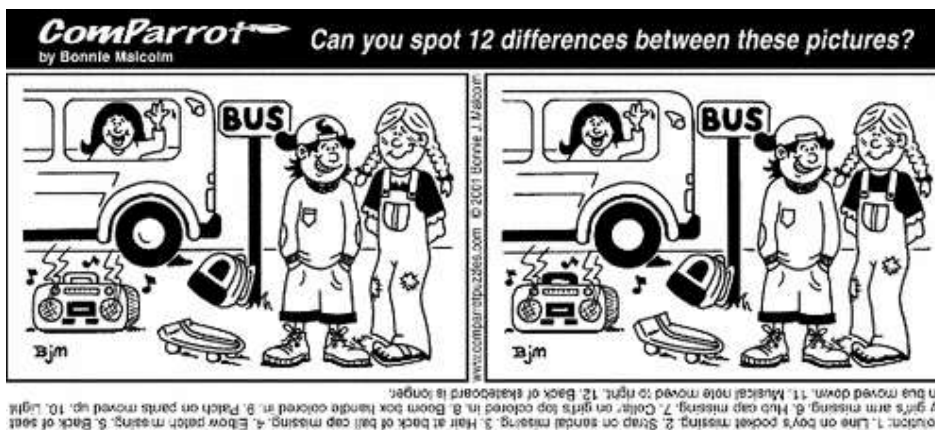
Freshman      Sophomore      Junior      Senior      Other

4) Are you visually impaired in any way that would prevent you from seeing details in pictures like the one below?

Yes                                      No

5) Have you ever done a “Spot the Difference” puzzle?

Yes                                      No



## Appendix F

### Feedback Letter

Thank you for participating in our study. The questionnaire was used in order to determine people's gender, age, visual ability and class level. Picture test was used to determine whether men or women pay more attention to details. We believe people pay more attention to detail when interested in the subject matter.

Please note that we are not interested in your individual results; rather, we are only interested in the results of a large group, of which you are now a part of. No identifying information about you will be associated with any of the findings.

If you have any questions or concerns regarding any portion of this study, please do not hesitate to bring them up now or in the future. Our contact information is found at the bottom of this letter. If you are interested in obtaining a summary of the findings of this study at a later date, please contact either of us and we will make it available to you at the completion of this project.

Thank you again for your valuable contribution to this study.

Sincerely,

Principal Investigators:

Jennifer Anstead (314)610-3009

Brittini Martin (618)841-9222