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EYEWITNESS MEMORY: EFFECTS OF SOCIAL PRESSURE AND GENDER ON  
MEMORY CONFORMITY

by

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A Thesis

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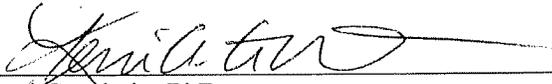
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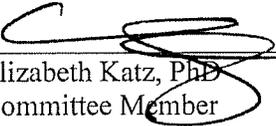
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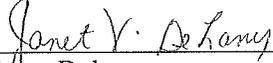
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## Abstract

### Eyewitness Memory: Effects of Social Pressure and Gender on Memory Conformity

Elana Schwartz

Literature demonstrates that a group discussion influences memory conformity and that misleading information is usually adopted into subsequent individual reports. The current study hypothesizes that social pressure to respond in a certain way among opposite gender group members will result in the adoption of more incorrect information about an event. A 2 (participant gender) x 2 (confederate gender) x 2 (information type) design was used. Sessions were conducted in groups of three (2 confederates and 1 participant). The group watched a video, completed filler tasks, had a discussion about the video, answered questions about the video and wrote an individual account. Statistically significant results were found for confederate gender and information condition. No statistically significant results were found for participant gender or the interactions hypothesized. These results demonstrate that memory conformity may occur when misleading information is introduced by other co-witnesses, which has important implications for eyewitness testimony.

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## **Introduction**

Humans have a tendency to share their memories and recollections with family and friends; similarly, when a group of people witness an event they may have this same tendency. In a study conducted by Paterson and Kemp (2006), they found that up to 24 hours after an event, eyewitnesses reported discussing the event with co-witnesses for emotional support and to provide information. This type of sharing is of the utmost importance as eyewitness testimony can play a large role in the criminal justice system. Police and detectives may pursue leads based on eyewitness accounts in order to apprehend a suspect and eyewitness testimony may be utilized in court. Both of the aforementioned uses of eyewitness reports rely heavily on the accuracy of the individual's memory; however, literature has shown that memory may be fallible, especially after discussions with other people. For example, according to Wright, Self, and Justice (2000) eyewitness errors are the most common reason for false convictions. Additionally, since the early 1990's out of 100 cases examined, over 75% of individuals that had been exonerated by DNA testing were originally convicted based on eyewitness identification (Wells & Olson, 2003).

The most compelling evidence against criminal defendants is eyewitness identification and therefore, false convictions may have important consequences. For example, in a country where the death penalty exists, the possibility that innocent individuals have been executed is not entirely unbelievable. As early as 1992 literature suggested that at least 23 innocent individuals had been executed (Huff, 2004). Additionally, eyewitness misidentification is the single greatest cause of wrongful

convictions (<http://www.innocenceproject.org/>). According to information provided by the Innocence Project as of 2012, 75% of 239 DNA exonerations (179 cases) involved eyewitness misidentification. This results in innocent individuals facing years in prison, while the actual criminals remain in society possibly committing additional crimes. Huff suggests that false convictions may also affect the criminal justice system as public confidence in the system decreases. Other consequences include the psychological impact false identifications may have on those who learn that their testimony led to the false imprisonment of an innocent individual (Wells, Small, Penrod, Malpass, Fulero, & Brimacombe, 1998) and the impact on victims, defendants, and their families (Mudd & Govern, 2004). Therefore, due the critical importance of accurate memory accounts from eyewitnesses, it is not surprising that a handful of literature exists on trying to understand eyewitness memory and how discussing the event may affect subsequent eyewitness reports.

### *Memory Conformity*

One might think that discussing an event after it occurs would not be harmful and may even be beneficial as individuals help each other to remember details about the event. However, in a series of several experiments conducted by Basden, Basden, Bryner, and Thomas (1997), it was found that memory intrusions (or false, non-presented information) were greater in collaborative groups of three compared to nominal groups (three individuals whose responses were analyzed as a group despite having worked alone) or individuals alone; this is despite the fact that collaborative remembering resulted in an increased number of items ultimately recalled. Weldon and Bellinger

(1997) conducted two experiments in which they found that a group who recalled information actually reduced the amount of information an individual alone within that group was able to recall, which was determined by an individual recall test either before or after a collaborative recall; they termed this *collaborative inhibition* (the group essentially inhibits individual remembering). In Experiment 1, there were two recalls of the same list of unrelated words and pictures: one individual recall on a blank sheet of paper and one where they recalled as many words and pictures as possible in a group and recorded everything that was mentioned. Results of this experiment indicated that group recall hindered the performance of the group as a whole. That is to say that an individual recalled more items when working alone than when working in a group. Experiment 2 was designed to see if this finding would extend to narrative stimuli- participants listened to the story “War of the Ghosts” twice and were asked to recall the story either individually or in a group. Results of this experiment were consistent with Experiment 1, indicating that collaborative inhibition extended to story recall as well. If the group inhibits the amount of recall an individual is capable of, when eyewitnesses discuss an event potentially crucial information may be left out- by more than just one member- which has serious implications for obtaining accurate information by police, detectives, etc. It may also be the case that inaccurate information is unintentionally introduced by a co-witness which may result in incorrect information in the subsequent recall by other co-witnesses.

The majority of eyewitness memory literature is focused individual recall after some type of misleading or inaccurate information has been presented. Discussing details

of a witnessed event can result in what is known as the *misinformation effect*. The *misinformation effect* is when an individual reports incorrect information in place of information about the original event (see Loftus & Hoffman, 1989; Loftus, 1991; and Loftus, 1992 for a review). A similar idea is known as *memory conformity* and occurs when an individual's report of an event becomes similar to that of another's report after a discussion (Gabbert, Memon, Allan, & Wright, 2004). Additionally, both misinformation and memory conformity may result in the formation of *false memories*, or memories that people may report despite an event never happening or a memory in which events happened differently than they actually remember (Meade & Roediger, 2002).

Misinformation may be introduced through post-event discussion, akin to eyewitnesses discussing an event, but misinformation may also be introduced through post-event narratives, similar to police or detectives asking an individual to re-read his or her statement. Gabbert et al. (2004) conducted an experiment in which they hypothesized that misinformation introduced socially (i.e., through a discussion) would show higher rates of memory conformity than misinformation introduced non-socially (i.e., through a written narrative). Participants watched a short video of a robbery and some read a narrative with either misleading information or accurate information. Other participants discussed the video with a confederate who introduced misleading information. After one of the previously mentioned three situations, the individuals completed an individual recall report of the video. Gabbert et al. found that more misleading information was incorporated into subsequent individual recall from participants in the biased-confederate condition than from the biased-narrative condition, demonstrating that individuals may be

more susceptible to information when that information is endorsed socially. This has implications for one witness who provides incorrect information to another for when they are later asked to recall the event. The current study will employ a social setting in which participants are face-to-face in order to maximize susceptibility to misinformation.

Earlier research supporting the susceptibility to misinformation in a social setting was described by Roediger, Meade, and Bergman (2001) in a process termed the *social contagion of memory*. Social contagion of memory is when individuals integrate false memories into subsequent reports of what they experienced, in which the false memories are introduced by others in a social context such as in a group discussion. In their study, Roediger et al. paired participants with an experimental confederate. Together, they viewed slides containing items in different scenes and were then asked to recall items from the scenes alternating turns (the confederate recalled some items not originally seen). After recalling items as a pair, the participant was given an individual recall test. The purpose of the study was to see if participants incorporated incorrect answers into their individual memory reports. The results indicated that participants did indeed recall some of the falsely reported items and claimed that they knew the item had been in the scene (as opposed to being suggested by the other “participant”).

In an extension of Roediger et al.’s (2001) study, Basden, Reysen, and Basden (2002) tested the social contagion of memory within perceived groups as opposed to in-person groups. In order to facilitate the perceived group, all four participants entered the lab at the same time and received the instructions together. The participants were told that they would be studying a list of words that they should try to remember as they would be

tested as a group afterward. They were told that they would take turns recalling words and that the answers of each group member would appear on the screen and the computer would prompt them when it was their turn to answer. In reality, each participant always answered as the “fourth” group member and was only aided by a computer. Overall, they found that participants were more likely to include a critical false word in their subsequent individual recall even when only working in perceived groups and not working in an exact face-to-face situation. These findings are important because even though participants could not see any other participants, they were influenced by their “responses” during the group recall. Thus, even perceived groups have a social influence on individual memory reports.

In addition to the effects of misinformation, there are several factors that have been shown to affect memory conformity in a social setting such as confidence, initial speaker, and perceived power. Wright, et al. (2000, Experiment 2) asked two participants to view a book with 21 photos of a robbery taking place; one member saw photographs that included an accomplice and the other member saw photographs that did not include an accomplice. A 16-item questionnaire about the pictures was then administered individually and they were also asked to provide a confidence rating for each picture. The participants then recalled the events in the photo together as if they were describing it to a police officer. The 16-item questionnaire was then re-administered. They found that conformity tended to follow in the direction of the participant with the higher confidence rating but only in the direction of those who said they saw an accomplice, and not for those who confidently reported that they did *not* see an accomplice. Similarly, Ost,

Ghonouie, Cook, and Vrij (2008) found that participants were more apt to conform to inaccurate responses when confederates gave higher rather than lower confidence ratings. As before, conformity followed in the direction of the confidence in seeing an accomplice to the crime rather than not seeing one.

In addition to confidence, the initial speaker has also been found to have an effect on conformity. Gabbert, Memon, and Wright (2006, Experiment 1) found that the participant who spoke first during the group discussion had more influence over the second person responding; that is, the second person was more likely to incorporate a critical previously unseen item into their own memory report. There were four pictures and each picture had two versions. The pair of participants viewed each picture (each with a different version) for 30 seconds, completed filler tasks, jointly recalled details of the picture, and then individually recalled details of the picture. This procedure was repeated with each of the four pictures. Results indicated that response order mattered and the second participant was more likely influenced after the first participant reported an errant item (that is an item that appeared in his or her picture but not his or her partners). This has implications for the recipients of whichever witness speaks first when they discuss an event.

Another factor that has been shown to affect memory conformity is the perceived power status of the individuals involved. More powerful individuals are less likely to be influenced by people they perceive as less powerful or powerless compared to themselves (Skagerberg & Wright, 2008). Power differences are an important part of many relationships, especially in the realm of eyewitness testimony where eyewitnesses are

typically questioned by police, detectives, and lawyers who may be perceived by witnesses as more powerful. In testing situations, low-powered individuals may be more likely to rely on the reports of high-powered individuals. Skagerberg and Wright suggested that as a result, a decrease in memory performance may be due to feelings of powerlessness which leads to a reliance on a co-witnesses report. Similarly, the memories of low-powered individuals may be more likely to be affected by high-powered individuals following a discussion, resulting in memory conformity.

Skagerberg and Wright (2008) asked participants (either individually or in pairs) to view 50 faces, shown at a rate of 3 seconds per face, and then had participants view 100 faces (50 of which had been shown before). As participants were shown the 100 faces, they were asked whether a face was shown before. In the paired condition, participants viewed 50 faces, and then they were randomly (by a coin toss) assigned a role of either a designer (low-powered) or a judge (high-powered). Once assigned to this role, they completed a power task in which the designer was given 5 minutes to design a restaurant and the judge was asked to evaluate the restaurant. Later, the paired participants viewed the 100 faces and were asked if they had viewed them before. In the individual condition, participants completed the recognition phase (100 faces) with no power task in between viewing 50 faces and the test. The findings indicated memory conformity, with lower-powered individuals conforming more to the memory reports of their higher-powered partners. There are several possible explanations for the memory conformity that Skagerberg and Wright found: (a) lower-powered individuals perform poorly when in the company of higher-powered individuals; (b) a feeling of

powerlessness may contribute to greater rates of source misattributions (that is, not remembering from where a target item was seen or heard); or (c) the lower-powered individual assumes the response of a higher-powered individual is correct. As mentioned before, this has implications for authorities questioning or speaking with eyewitnesses in order to obtain eyewitness reports. In the current study, having a confident confederate with established credibility (as he or she reports having seen the movie before) is designed to instill a perceived power differential that may influence memory conformity.

### *Gender Conformity*

While there are several known factors that influence conformity in social situations such as those mentioned previously, there are some factors that are less explored. Over the years, research on gender conformity has provided mixed findings and has been a topic of debate. Some studies have found that women conform more than men and some studies have found no differences at all, although now it is generally accepted that the difference is small if there is one. Endler (1966) found that females conformed more than males, generally. He also found that this conformity was greatest when the experimenter provided reinforcement when the participant agreed with the group. In 1971, Sistrunk and McDavid found that sex as an overall factor was not significant, but that when combined with other factors- such as task difficulty or sex-relatedness of task, conformity may be observed. They concluded that there may be situations in which women conform more than men or when men conform more than women. Cooper (1979) argued that a qualitative approach to meta-analysis was better than a descriptive one and conducted a statistical meta-analysis of conformity research. He found that overall

women conform more than men (generally) and this is even more present in face-to-face interactions.

Alice H. Eagly is one leading researcher who examined gender differences in conformity in the 1970's and 1980's. Eagly's 1978 meta-analysis brings to light that individual gender differences are not as prominent as researchers once thought, but that in situations of group pressure there is more evidence that females conform more than males. Limited research shows that females are more persuaded by male communicators and males and females do not differ when the communicator is female. In second meta-analysis, Eagly and Carli (1981) outlined that (a) males were less influenced than females but the effect sizes were small in magnitude and b) group pressure conformity situations produced more conformity in females but again the effect sizes are small. One factor that may be responsible for the gender differences in conformity is the surveillance (or observation) that group members have over each other's answers or responses (Eagly & Chrvala, 1986). In a two session experiment, they had undergraduates fill out a questionnaire about campus issues and a Personal Attributes questionnaire (first session) and then form impressions about the group members based on their opinions from the campus issues questionnaire (second session). In the surveillance condition, participants were told that after forming opinions they would be required to share their own opinions on each issue with the group members before a discussion of one issue and after that would be required to summarize their impressions of other group members. In the no-surveillance condition, subjects were told their written responses would be handed to the experimenter and were given no instructions about sharing their opinions before the

discussion but were told they would be sharing impressions after the discussion. Results of this experiment demonstrated that women conformed more than men in the surveillance condition and found no significant difference between men and women in the no-surveillance condition. Possible explanations cited were due to the submissive nature of women or to learned socialization pressures that arise for boys and girls. For example, boys are typically socialized for task-oriented or instrumental roles that may lead them to be less influenced by others versus girls who may be socialized for communal roles which lead them to be more influenced as they are more concerned with others.

Collin, Di Sano, & Malik (1994) hypothesized that they would find no gender difference in conformity in their study. Similar to Solomon Asch's 1950's conformity experiments, the confederate conditions in Collin et al.'s study contained three confederates and the participant always answered last. There were four possible conditions: male confederates/male participant, male confederates/ female participant, female confederates/male participant or female confederates/female participant. The participants' first session was completed alone in which they were asked to identify the color of the circle on the screen based on two choices given by the interviewer. The second session occurred one week later and included the confederates. Conformity was measured by comparing the participant's responses on the individual session with responses changed in the confederate sessions. The hypothesis was disconfirmed when a significant main effect for gender was found; women conformed more than men.

Additionally, there was not a significant interaction effect between confederate gender and subject gender.

Mori and Arai (2010) conducted an interesting study in Japan where they replicated the Asch line judgment study without the use of confederates and were interested in gender differences in conformity. The Mori Technique is one in which the subjects put on “sunglasses” that are polarized in different directions so that when the lines were viewed through the glasses a certain line actually appeared shorter or longer. They used groups of same gender subjects. The first, second, and fourth seats all contained the same kind of glasses and the third seat contained a different set of polarized glasses thus making a majority group (seats 1,2, and 4) and a minority (seat 3). Eighteen trials were conducted where six trials were neutral (where the minority and majority all saw the same line as matching the target) and twelve trials were different (where the minority saw a different line as being the same as the target). Results indicated that the minority (3<sup>rd</sup> seat) made errors three times more often than the other three participants, the minority erred more because they conformed to the majority, and there was no conformity among the minority men. Therefore, they found that women conformed more than men. They posed a possible explanation that in Japanese culture boys become more independent and less conforming as they develop perhaps buffering against conforming behavior.

### *The Present Study*

While many of the studies that have found gender differences in conformity report small effect sizes it is still important to investigate because there are situations that make

gender conformity more or less salient. For example, women seem to conform more when their answers are observed by other group members (Cooper, 1979; Eagly & Chryala, 1986). In eyewitness proceedings, it is not unusual for eyewitnesses to discuss what they saw with others and to answer questions in front of others who are perceived as powerful (police, detectives, courtroom, etc.) suggesting that conformity may occur in such situations.

The proposed study intends to examine the gender differences in conformity and effects of social influence within eyewitness memory. With regards to eyewitness memory, specifically to viewing crime-related information, gender research has not been explored exclusively. Literature suggests that there are conditions that may lead women to conform more than men and those conditions happen to be highly characteristic of eyewitness discussion and memory recall procedures. For instance, participant responses are monitored throughout the entire study (with the exception of the individual recall to see if they adopt misinformation) which is a factor known enhance conformity in social situations. The proposed study predicts that women are more likely to conform than men in a group situation where their answers can be observed by group members.

Additionally, the literature suggests that a power differential influences how lower-powered individuals respond in a test situation. The use of confederates in the current study address this factor as one confederate is trained to appear confident and more credible, and therefore, presumably, a more powerful individual. The perceived power of the confederate is important in understanding how memory conformity can occur when high-powered individuals interact with lower-powered individuals, such as

during discussions of an event. Additionally, the seating in this study is controlled so that the confident confederate is always the first to answer, followed by the second confederate and lastly by the participant. This is due to the fact that research has found an effect for response order (Gabbert, Memon, & Wright, 2006). Understanding elements that influence eyewitness testimony may help in increasing the accuracy of eyewitness identifications and demonstrate under what conditions co-witness discussion is the most persuasive. Additionally, understanding gender interactions as well as power differentials may prompt eyewitness questioning and information gathering in certain ways.. For these reasons, further research on gender conformity in relation to eyewitness memory is necessary.

### **Variables**

The independent variables in this study are confederate gender (male or female), participant gender (male or female), and information type (misleading or consistent). The dependent variables in this study are a group cued recall and an individual free recall. The group cued recall is a measure of conformity by which the number of critical items (both accurate and false) are counted. If the participant endorses critical items (especially misleading items), it is presumed that the participant is conforming by adopting what she or he hears from the previous participants (actually confederates). The individual free recall is designed to see how many critical items are reported (especially misleading items) on a subsequent individual report, despite that people may know these answers are wrong. If the participant endorses critical items both as part of a group and individually, it is presumed that they are conforming to the responses given by the others.

## Proposed Study Hypotheses

**Main Effects.** The first hypothesis predicted a difference between the types of information received- *consistent or misleading information*. I predicted that a main effect would be observed in that participants would be less accurate in their memory reports upon receiving misleading information than consistent information. For those in the consistent information condition, I expected that the participants would be more accurate in their memory reports following consistent information about the video.

**Interaction Effects.** Although I did predict a main effect of confederate gender or participant gender, the second and third hypotheses predict an interaction between them. The second hypothesis predicted that there would be an interaction effect between *confederate gender* and *participant gender*, specifically when the genders were inconsistent. I hypothesized that participants would conform more when in the presence of group members of the opposite gender. In following the results of current social influence, it is predicted that women will be more conforming than men. The third hypothesis predicted that there would be a significant three-way interaction effect between *confederate gender*, *participant gender* and *type of information*. In the misleading information condition, the prediction was that female participants would adopt more misleading information into their recall when in the presence of opposite gender group members (male confederates) when compared to male participants in the presence of opposite gender group members (female confederates). This effect may be observed due to perceived power differentials whereby men may not experience the same

perceived authority from female group members as females may experience from male group members.

## **Method**

### *Participants and Design*

A total of 154 undergraduate students from Towson University were recruited via the online subject pool. Students earned credit that could be applied towards psychology courses.

The design is a 2 x 2 x 2 (Confederate Gender: male/female, Participant Gender: male/female, and Type of Information: consistent/misleading). Each session had one participant and two confederates that were both either the same gender or the opposite gender of the participant. Throughout the study, there were a total of 15 confederates—eight females and seven males. The timeslot in which a participant signed him or herself up for determined the confederate condition that he or she was in as several sessions a week were sessions in which there were male confederates and several sessions a week with female confederates. The information condition was predetermined as each information condition (consistent or misleading) was scheduled to run for approximately four weeks during the semester. At the start of each semester, the consistent information was the first condition to be run so that the confederates could get accustomed to the script using accurate information. The dependent measures were the participant's answers to the group cued recall and the participant's individual free recall response. The total number of accurate details endorsed was scored on the group recall and the

individual recall. And the total number of inaccurate details (misleading items) was scored on both the group recall and individual recall as well.

### *Materials*

A 7 minute video of a crime was viewed by all participants. The video was a clip from the 1975 movie *The Return of the Pink Panther* in which the robber is chased by several guards after stealing a precious diamond (as used in Lindsay, Allan, Chan, & Dahl, 2008). Two sets of filler tasks were administered to separate time between the video and a group discussion and again between the group discussion and the group cued recall. The first set of filler tasks completed were a series of arithmetic problems, a trail-making task, Digit Symbol Substitution Coding B (WISC-IV), a Sudoku number puzzle (Dell Magazines, 2008), and general recall knowledge of U.S. states and capitals. The second set of filler tasks completed included several mental rotation problems, a trail-making task, arithmetic problems, a word stem completion task, a Sudoku number puzzle (Dell Magazines, 2008), and general recall knowledge of U.S. presidents.

The group cued recall was comprised of 13 questions referencing details from the video clip mentioned above; and the details were changed depending on the information condition. The test questions were adapted from Lindsay et al. (2008). The individual recall was a single sheet of paper filled with ample space on which the participant and confederates could write all of the information that they recalled from the video.

### *Procedure*

The experimenter and the confident confederate were always the first in the room. Upon arrival, the participant was asked to take a seat in the same row as the other

“participant” that had already arrived and both were then told that one more “participant” was expected. The second confederate was instructed to arrive on time; but usually the second confederate arrived just after the participant and took the seat in the middle that had been left open. In the rare occasion that the participant sat directly next to the first confederate already in the room, the second confederate was trained in selecting a seat that placed the actual participant on the end (rather than the middle). Once all were present, informed consent was obtained after which the group viewed the video together. The participants were instructed to pay attention to the video as they would be asked questions about it. At the conclusion of the video, the group was asked to complete the first set of filler tasks. After ten minutes, the experimenter told the group to stop wherever they were and then collected each group member’s packet. The participants were then instructed to have a discussion regarding what was seen in the video that lasted a maximum of five minutes. At this point depending on the information condition, the confederates introduced details either consistent or inconsistent with what occurred or was shown in the video clip.

After the group discussion, the participants completed another 10 minutes of filler tasks. Immediately following the second set of filler tasks a group cued recall test, in which the experimenter asked 13 questions about the video, was administered. Each group member provided a response to every question and the experimenter recorded each answer provided by the subjects. In the individual free recall following the group cued recall, participants were given a blank sheet of paper on which they were asked to write down everything that they could recall from the video. There was no time limit for

the group recall or individual recall; the tasks ended once all 13 questions were asked and answered or when they finished writing their accounts of the video, respectively. Each individual then completed a post-study questionnaire which probed for any suspicion on the part of the actual participant was administered on paper. During training, the confederates were instructed to finish this questionnaire before the participant so that they could exit the room as quickly as possible leaving the last person remaining the actual participant. Once the participant had completed the post-study questionnaire a full debriefing was given and any questions were answered.

## **Results**

### *Coding and Scoring*

The purpose of the study was to determine whether participants would adopt false information when the information was presented by confederates in a group discussion. There were 13 critical items that the confederates brought up in the group discussion and the group cued recall asked 13 questions specifically about those details. The items were scored by the investigator and there were three possible ways for an item to be scored: false critical, accurate critical, or other. The 'Other' category was used when people gave answers such as "I don't know" or "I did not see." The individual recall was a free recall and participants wrote paragraphs or used bullet points to report their individual account. The instructions for the free recall were to write down what they remembered from the video from the general picture to the smallest details. As before, the investigator scored the items on this measure and items were coded as follows: false critical or accurate critical. Only the total number of false critical items and total number of accurate critical

items reported was analyzed on each of the recall tests; the maximum critical item total was 13.

### *Multivariate Analysis of Variance*

A 2 (Participant Gender) x 2 (Confederate Gender) x 2 (Information Type) MANOVA was used to analyze the total number of accurate and false details reported on both a group recall and an individual recall. The analysis yielded a significant multivariate main effect for confederate gender, Wilks'  $\lambda = .918$ ,  $F(4,143) = 3.18$ ,  $p < .05$ ,  $\eta^2 = .08$ , power = .81; and a significant multivariate main effect for information condition, Wilks'  $\lambda = .184$ ,  $F(4,143) = 158.46$ ,  $p < .05$ ,  $\eta^2 = .82$ , power = 1.00. Given the significance of these two main effects, the univariate analyses were examined for each dependent variable.

### *Main and Interaction Effects*

Univariate analysis for confederate gender on group recall and individual recall only indicated a significant effect on the accurate item total for individual recall,  $F(1,146) = 11.93$ ,  $p < .05$ ,  $\eta^2 = .08$ . The analysis indicated that more accurate items were recalled in the presence of female confederate ( $M = 2.7$ ,  $SD = 2.1$ ) when compared with a male confederate ( $M = 1.6$ ,  $SD = 1.6$ ).

Additionally, significant effects of information condition were found on each of the dependent variables as follows: false item recall on group recall  $F(1,146) = 294.37$ ,  $p < .05$ ,  $\eta^2 = .67$ ; accurate item recall on group recall  $F(1,146) = 629.14$ ,  $p < .05$ ,  $\eta^2 = .81$ ;

false item recall on individual recall  $F(1,146) = 65.75, p < .05, \eta^2 = .31$ ; and accurate item recall on individual recall  $F(1,146) = 71.35, p < .05, \eta^2 = .33$ . These results indicate a misinformation effect whereby participants report more false items after hearing misleading information presented by confederates (Table 1).

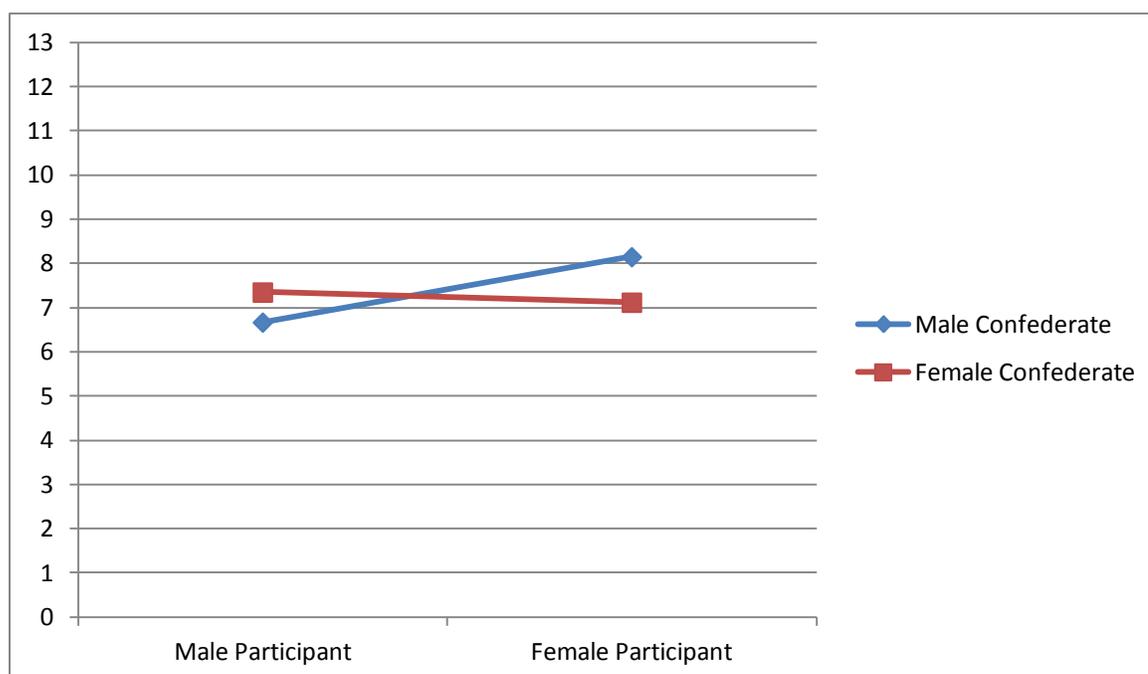
Table 1. *Critical Item Recall by Condition*

<b>Recall Test</b>	<b>Mean</b>	<b>Standard Deviation</b>
<b>False Group Recall</b>	4.4	4.1
Misleading Information	7.3	2.9
Consistent Information	0.5	0.9
<b>Accurate Group Recall</b>	5.6	4.2
Misleading Information	2.4	1.5
Consistent Information	10.0	2.1
<b>False Individual Recall</b>	0.9	1.4
Misleading Information	1.6	1.5
Consistent Information	.05	0.2
<b>Accurate Individual Recall</b>	2.3	1.9
Misleading Information	1.3	1.3
Consistent Information	3.6	2.0

The multivariate main effect for participant gender was not significant, Wilks'  $\lambda = .981, F(4,143) = .699, p > .05, \eta^2 = .019, \text{power} = .22$ . There were no statistically significant findings for either of the hypothesized interactions; confederate gender and subject gender, Wilks'  $\lambda = .982, F(4,143) = .649, p > .05, \eta^2 = .018, \text{power} = .21$  and confederate gender, subject gender, and information condition, Wilks'  $\lambda = .977, F(4,143) = .835, p > .05, \text{power} = .262$ . Thus, the data did not support hypotheses two and three. While the data was not statistically significant, it is interesting to note that the mean number of false items recalled in the group recall lean in the direction of the proposed

hypothesis whereby female participants report more false items when in the presence of a male confederates and male participants report more false items when in the presence of female confederates (Figure 1). This is for the misinformation condition only.

Figure 1. *Misleading Items Recalled by Participant and Confederate Gender*



### *Suspicion Check*

Participants were also given a post-study questionnaire in which they were asked to explain what they believed the purpose of the study to be. Two raters familiar with the protocol rated whether or not they believed that the participants guessed the hypothesis. A Kappa statistic was utilized to determine consistency among the raters; it was found to be statistically significant,  $Kappa=0.843$ ,  $p<.001$ . Additionally, of the 154 participants, 12 participants informed the experimenters before the debriefing that they thought the other

participants were confederates and had been instructed to say certain things. When the 12 participants were removed from the post-study questionnaire scoring, the raters were in agreement on 97.2% of the remaining participants.

### **Discussion**

A significant main effect was found for information condition. Both male and female participants reported more critical false items in the misleading information condition and more critical accurate items in the consistent information condition. This study is consistent with previous literature whereby misinformation can be transmitted through social interactions and that it may be reported on subsequent individual accounts. This element is of extreme consequence to eyewitness reports in real life (see Huff, 2004; Wells, Small, Penrod, Malpass, Fulero, & Brimacombe, 1998). If witnesses discuss an event and misinformation is accidentally shared, inaccurate witness reports may result in false arrests or a delay in solving a crime leading to consequences that might have been avoided if accurate information was provided at the start.

Unexpectedly, a main effect of confederate gender was found. The main effect was found specifically for female confederates. The mean number of accurate items reported in the individual recall was higher when a female confederate had been present compared to a male confederate. One possible explanation for this finding could be trustworthiness. Wright and Sharp (1979) found that a modified version (specifying the sex of the reference group to be trusted) of Rotter's Interpersonal Trust Scale demonstrated that both men and women trust women more. More recently, Garbarino and Slonim (2009) utilized an Investment Game, where players can send and return any

amount of money, to understand trust and reciprocity. They found that women were trusted more (i.e., they were sent more by both men and women) despite the fact that they did not always reciprocate (i.e., they did not necessarily return more than men). Future research in this area may want to explore perceived trustworthiness as a moderator to see what effects, if any, this has on the likelihood of adoption of misinformation. This may help to elucidate the current finding that there is an effect of confederate gender.

Additionally, as expected there was no main effect of participant gender. One explanation for this could be that women and men do not differ in their *ability* to recall details from an event. While one gender may be more likely to recall certain details, for example, females may be better recalling the appearance of a criminal (Horgan, Mast, Hall, & Carter, 2004), overall ability in recalling an event may not differ. DeMayo and Diliberto (2003) had participants view pictures of men or women performing household chores in the study phase and note the pictures that had appeared before in a recognition phase that included new lures (different but related pictures). While they found evidence for a false memory effect related to lures, they failed to find an effect of participant gender. Similarly, Bauste and Ferraro (2004) found no gender differences when they tested undergraduate men and women on false memory production on word lists and critical lures. While the method of exploring memory differed in the aforementioned studies, it demonstrates that *ability* in recall may not be different between genders regardless of whether the information is shown in pictures (akin to a video) or words.

The second and third hypotheses in this study, which predicted interaction effects between participant gender, confederate gender, and information condition, were not

supported by the data. The rate at which participants report misleading or accurate information is not necessarily affected by same or opposite gender group members. This information is important as it indicates that eyewitnesses are similarly influenced by misinformation, as well as by accurate information, whether it comes from male or female co-witnesses. However, it is interesting to note that the mean number of false items recalled was slightly higher (though not significantly) when female participants were in the presence of male confederates compared to in the presence of female confederates. Furthermore, males reported more misinformation when in the presence of females compared to males. One possible reason as to why an interaction effect may not have been found may have to do with the fact that in this study all of the confederates were perceived as credible and confident. Once the confederates were on the same level, there may not have been any reason for one gender to influence the other more than the other.

There are several limitations to the current study. Unequal group size is the first limitation. In this study there were eight groups, four in the misleading information condition and four in the consistent information condition. The largest group contained 26 participants and the smallest group contained only 11, with the next smallest having 13, and after that 17. The unequal group sizes may not have allowed for an adequate analysis between groups. With equal group sizes, we could be more confident in the effects that were found or not found.

Another limitation of the study is that a college-age sample was used. Several studies have evidence for an age difference (Eagly & Chrvala, 1986; Coxon & Valentine,

1997; Gabbert, et al., 2004) in which children and older adults differ in the rates of memory conformity and recall when compared to young adults. While an effect was not found in the current study, there may be some gender differences in older or younger populations. Since some of the earlier literature (Eagly and Chrvala, 1986) suggests that gender roles affect conformity, gender roles may be more salient in older generations and therefore rates of conformity may differ across generations. This is relevant to eyewitness memory as any age group may witness an event and it is important to understand the types of people for who co-witness discussion might have the greatest influence.

Two other limitations of this study are lack of random assignment and lack of power. In this study, participants were not randomly assigned to one of the eight conditions. The information condition was predetermined as was whether they would be with male or female confederates. Additionally, the timeslot a participant signed up for was self selected. This lack of random assignment may have impacted results. The lack of power may also have been a reason for not observing some of the predicted results. The highest power of non-significant results was .262, with the lowest being .096. This lack of power may have been especially important for the interactions predicted.

In conclusion, the current study is consistent with the majority of previous literature stating that there are no gender differences in memory conformity. One explanation for these results may have been that memory conformity was not measured the same way in studies where a gender difference was found. The method in previous studies utilized the traditional conformity arrangement found in Asch's studies (Collin, et al., 1994; Mori & Arai, 2010). This approach was partially utilized; however, a

subsequent individual recall was necessary in order to examine the rates that which misinformation stayed with an individual. Additionally, Eagly & Chvrvala (1986) found a gender difference whereby women conformed more than men when their answers were to be observed; however, the methodology was different as the participants were instructed that they would have to share attitudes and opinions of certain issues and of each other. Previous literature has also proposed that gender differences are usually small, if they are found at all (Eagly 1978; Eagly, 1981) and therefore unequal group sizes in the current study would have greatly affected the possibility of a visible difference. Additionally, there appears to be some support in favor of information coming from women affecting subsequent individual recall. This contradicts some literature that had not found any affect for confederate gender (Collin, et al., 1994). Overall, the current study provides additional evidence that people are highly influenced by discussions with others and the implications of this research further demonstrate how eyewitness testimony may be affected by such discussions.

## Appendices

## Appendix A



Date: Monday, November 22, 2010

**NOTICE OF APPROVAL**

**TO:** Elana K. Schwartz      **DEPT:** PSYC

**PROJECT TITLE:** *Gender differences in the effects of social pressure on eyewitness memory*

**SPONSORING AGENCY:**

**APPROVAL NUMBER:** 11-A038

Office of University  
Research Services

Towson University  
8000 York Road  
Towson, MD 21252-0001

t. 410 704-2236  
f. 410 704-4494

The Institutional Review Board for the Protection of Human Participants has approved the project described above. Approval was based on the descriptive material and procedures you submitted for review. Should any changes be made in your procedures, or if you should encounter any new risks, reactions, injuries, or deaths of persons as participants, you must notify the Board.

A consent form:  is  is not required of each participant

Assent:  is  is not required of each participant

This protocol was first approved on: 22-Nov-2010

This research will be reviewed every year from the date of first approval.

A handwritten signature in cursive script that reads "Patricia Alt".

Patricia Alt, Member

Towson University Institutional Review Board

**APPROVAL NUMBER: 11-A038**

To: Elana K. Schwartz  
8000 York Road  
Towson MD 21252

From: Institutional Review Board for the Protection of Human  
Subjects, Patricia Alt, Member

Date: Monday, November 22, 2010

RE: Application for Approval of Research Involving the Use of  
Human Participants

A circular stamp from the Institutional Review Board for the Protection of Human Subjects at Towson University. The stamp contains the word "APPROVED" at the top, the date "NOV 22 2010" in the center, and "TOWSON UNIVERSITY" at the bottom. There are handwritten initials and a signature over the stamp.

Thank you for submitting an Application for Approval of Research Involving the Use of Human Participants to the Institutional Review Board for the Protection of Human Participants (IRB) at Towson University. The IRB hereby approves your proposal titled:

*Gender differences in the effects of social pressure on eyewitness memory*

If you should encounter any new risks, reactions, or injuries while conducting your research, please notify the IRB. Should your research extend beyond one year in duration, or should there be substantive changes in your research protocol, you will need to submit another application for approval at that time.

We wish you every success in your research project. If you have any questions, please call me at (410) 704-2236.

CC: Kerri Goodwin  
File

Appendix B  
**Consent Form**

**STUDY TITLE:** *WHAT WE REMEMBER*

**PRINCIPAL INVESTIGATOR:** Elana K. Schwartz, B.A.

**FACULTY SPONSOR:** Kerri A. Goodwin, Ph.D

**1. What you should know about this study:**

- This research is experimental and is being conducted as part of a master's thesis.
- You must be 18 or older to participate in this study.
- A small part of the study session will be audio-taped.
- Your participation in this study is completely voluntary. You may agree to be in study now and change your mind later.
- Please let me know as soon as possible should you choose to withdraw from the study at any point.
- Topic: People choose to pay attention to different aspects of their environment. This study is looking to see if there any patterns in what people pay attention to. While people are diverse, perhaps what we choose to pay attention to is not so different after all.
- This study is expected to last one (1) hour.

**2. What will be required of you should you choose to join this study:**

- You will be asked to sign this consent form today and should you sign, complete the study today.
- You will watch an 8-minute video.
- You will complete a series of tasks, such as arithmetic problems, mental rotation problems, general knowledge questions, a Sudoku puzzle, and tests about the video.

**3. What are the risks of being in the study:**

- There are no risks foreseeable in the study.
- Should the study become distressing to you, it will be terminated immediately.
- Should the investigator learn of any information that may indicate a risk to you, you will be notified before the start of the study.

**4. Compensation/Course Credit:**

- There is no monetary compensation for this study.
- After completion of the study session you will be assigned credit that may be applied to various courses (at the instructor's discretion) via the on-line research pool.

**5. How confidentiality will be maintained:**

- Should you choose to take part in the study, you will be assigned a randomly generated identification ID and no other form aside from this consent form will contain your name.

- Your participant ID will not be able to be traced to your consent form in any way. This means that no one will know what consent form goes with which participant ID.
  - Consent forms will be stored in a locked space away from any collected study data.
  - Collected study data will be stored in a separate locked space.
  - Should the investigator choose to publish the research, data will be reported as a group and no participant will be individually identified either by name or generated ID.
- 6. Should questions, problems, or concerns arise:**
- If you have any questions, problems, or concerns (at any time, even after the completion of the study), the following individuals may be contacted:
    - Elana K. Schwartz (Investigator)
      - [Eschwa10@students.towson.edu](mailto:Eschwa10@students.towson.edu)
      - (410) 868-4164
      - 2400 Willow Glen Drive, Baltimore MD 21209
    - Dr. Kerri Goodwin (Faculty Sponsor)
      - [kgoodwin@towson.edu](mailto:kgoodwin@towson.edu)
      - (410) 704-3202
      - Psychology Building, Room 212B
    - Dr. Debi Gartland (Institutional Review Board Chairperson)
      - [ours@towson.edu](mailto:ours@towson.edu)
      - (410) 704-2236
      - 7800 York Road, Rooms 225-220

If you have chosen to participate in the study, please read and initial next to the three statements below and then please sign and date on the appropriate lines. You will be given a copy of this form for your records.

\_\_\_\_\_ I have had the information in this consent form read and explained to me.

\_\_\_\_\_ I understand that a small part of the session will be audio-taped.

\_\_\_\_\_ My questions have been answered and I understand what is required of me for this study.

---

Participant's Signature

Date

---

Investigator's Signature

Date

## Appendix C

### Debriefing

Thank for participating in this study! It is greatly appreciated. Before you leave for the day, I would like to go over a few things with you. In this study, you were asked to watch a video and then recall information from the video after a group discussion. This is similar to what happens when eyewitnesses discuss an event right after it occurs, but before speaking with police or detectives. What I was actually interested in is how men and women respond in the presence of the same or opposite gender individuals after a group discussion. Therefore, both of the other “participants” were actually confederates. A confederate is what we call someone who was placed into the study by the experimenter and is meant to be perceived as an actual participant. I could not actually tell you that these people were never a part of the study because it may have changed the way you responded to the information that they said or the discussion that you all had.

Additionally, in your condition the confederate may or may not have provided misleading information about what was actually in the video. Often times in eyewitness accounts information is reported that was actually heard from someone else and may or may not be correct, which has an impact on eyewitness testimony and the legal system. The possible introduction of misleading information was to see if men or women were more likely to incorporate false information in their memory reports. I could not tell you that there was a chance that you would hear misleading information because it may have changed how you viewed what the confederates were saying. Knowing that the “participants” were actually confederates or that they might provide false information may have changed how you responded in the study today, which could subsequently affect the validity or reliability of this study.

Are there any questions? (*Wait a moment to see if there are any questions, answer them if any.*) Lastly, I would like you to keep in mind that other students will be participating in this study and the results would not be valid if they knew the true purpose of this study, so I am asking that you not discuss the nature of this study with any fellow students.

Should you have any additional questions or concerns, please feel free to contact any of the three individuals listed in your consent forms.

Again, thank you very much for your time today.

## Appendix D

*Consistent Information Script*

(information is consistent with what is shown in the video; critical items on cued recall test are bolded)

The robber used a **silver** crossbow, pulley and zip-line to gain access to the museum roof. He then lowered himself down after the crossbow. As he lowered himself you could see a painting hanging above the doorway that had a **brown frame with a white border**- only the bottom part was visible. The thief then went through the hallway and started setting up his crossbow to get to the diamond. There was a statue **in the wall** in the hallway where he was setting up. He poured the oil on the floor and placed a **small black pad** on the ground to slide through on his back as he pulled on the wire. In the big room where the diamond was there were designs on the floor and a **shield** on the wall into which he shot his crossbow arrow.

As he was trying to get the diamond, several guards were shown a few times and one of them was smoking a **cigarette**. As the thief lifted the cover off of the diamond you could see that there was some silver **ornamentation** sculpted on the top; and then he tied off the wire so that **the cover was hanging in the air**. At one point you could see a lot of the artwork in the room and there was one that was hanging from the ceiling- **a blue, white, and red lantern**. He used **two tools** to lift the diamond off of the stand while he was lying on the red carpet **shaped like an octagon**. With the tools he dropped the diamond and put it in his pocket. He then used one of the tools to leave a white **glove** that had the letter 'P' sewn onto it. Then, he left by sliding back along the floor when the guard that was smoking noticed the diamond was gone. As the guard rushed in, the thief rushed out and took the stairs to the roof. He ran along the roof while **4** guards chased him. The video clip ended there.

*Misinformation Information Script*

(information is inconsistent with the video ONLY for the critical items; critical items on cued recall test are bolded)

The robber used a **black** crossbow, pulley and zip-line to gain access to the museum roof. He then lowered himself down after the crossbow. As he lowered himself you could see a painting hanging above the doorway that had a **white frame and a gray border**- only the bottom part was visible. The thief then went through the hallway and started setting up his crossbow to get to the diamond. There was a statue **on the floor** in the hallway where he was setting up. He poured the oil on the floor and placed a **large black towel** on the ground to slide through on his back as he pulled on the wire. In the

big room where the diamond was there were designs on the floor and a **sword** hanging on the wall into which he shot his crossbow arrow.

As he was trying to get the diamond, several guards were shown a few times and one of them was smoking a **cigar**. As the thief lifted the cover off of the diamond you could see that there was some silver **lettering** sculpted on the top; and then he **lowered the cover to the floor**. At one point you could see a lot of the artwork in the room and there was one that was hanging from the ceiling- a **yellow chandelier**. He used **three tools** to lift the diamond off of the stand while he was lying on the red carpet **that was circular**. With the tools he dropped the diamond and put it in his pocket. He then used one of the tools to leave a white **cloth** that had the letter 'P' sewn onto it. Then, he left by sliding back along the floor when the guard that was smoking noticed the diamond was gone. As the guard rushed in, the thief rushed out and took the stairs to the roof. He ran along the roof while **5** guards chased him. The video clip ended here.

Appendix E  
**Group Cued Recall Test**

1. What color was the crossbow that the thief used?
2. In the first room that the thief enters there is a painting hanging above the door behind the thief. What did that painting look like?
3. In the dimly lit hallway that the thief walked through just before he slid through across the floor, there was a sculpture. What did that sculpture look like?
4. Aside from the crossbow, the thief uses other materials to help him slide across the floor, what were those materials?
5. Something metallic and associated with warfare was hanging on the wall in the big room where the diamond was, what did it look like?
6. Think about the third guard seen in the video. What is he smoking?
7. What was sculpted onto the stand in the big room where the diamond was?
8. There was artwork on the ceiling in the big room, what did it look like?
9. What is the color and shape of the carpet underneath the diamond?
10. How many tools did the thief use to retrieve the diamond?
11. Where does the thief place the clear covering that was over the diamond?
12. What does the thief leave at the scene before he flees?
13. How many guards were chasing the thief?

Appendix F  
**Suspicion Check**

*Please answer the following questions. Place this questionnaire in the box on the table when completed.*

1. Please describe the purpose of the study in your own view: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
2. A video was shown in this experiment. Had you seen the video before? **Circle YES or NO.**
  - a. If YES, did you identify the title of the film before it was mentioned?  
**Circle YES or NO.**
3. Did you question your memory at any point in the experiment? **Circle YES or NO.**
4. Please think of one of the other participants, what was your reaction to this participant? \_\_\_\_\_  
\_\_\_\_\_
5. For this question, please think of the other participant (the one you did not consider in Q#4). What was your reaction to this participant? \_\_\_\_\_  
\_\_\_\_\_
6. Did you change your answers based on any of the information you heard from the other participants? **Circle YES or NO.**
7. Was there any difference in the answers that you provided when asked questions compared to when you wrote down your own account? **Circle YES or NO.**

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## CURRICULUM VITA

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**Education**

Towson University  
 Clinical Psychology  
 Master of Arts, 2012

University of Maryland, College Park  
 Psychology and Dance  
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**Research/Relevant Work Experience**

- |   |                         |
|---|-------------------------|
| University of Maryland, Department of Psychiatry<br>Research Assistant, Clinical<br>Study coordinator and assessor on studies evaluating mental health services offered to veterans       | July 2011-Present       |
| Johns Hopkins Behavioral Pharmacology Research Unit<br>Student Intern<br>Assessor on clinical drug trials for opiate and alcohol dependence and cognitive training study for older adults | Jan. 2011 –July 2011    |
| University of Maryland, Department of Psychiatry<br>Student Intern<br>Assessor on family member provider outreach study and antipsychotic medication study for veterans                   | Sept. 2011 –May 2011    |
| Aspen Day Treatment<br>Administrative Assistant<br>Scheduling, coordinating insurance reimbursement for patients and helping psychologist in group therapy sessions                       | June 2009- January 2010 |
| University of Maryland, College Park<br>Research Assistant<br>Ran sessions for an impression formation study and entered the data   | Sept. 2008 – May 2009   |

