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# Memory Conformity: Actors and Bystanders

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MEMORY CONFORMITY: ACTORS AND BYSTANDERS

A dissertation submitted in partial fulfillment of the

requirements for the degree of

DOCTOR OF PHILOSOPHY

in

PSYCHOLOGY

by

Mariana E. Carlucci

2011

To: Dean Kenneth Furton  
College of Arts and Sciences

This dissertation, written by Mariana E. Carlucci, and entitled MEMORY CONFORMITY: ACTORS AND BYSTANDERS, having been approved in respect to style and intellectual content, is referred to you for judgment.

We have read this dissertation and recommend that it be approved.

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Daniel Wright, Major Professor

Date of Defense: June 14, 2011

The dissertation of Mariana E. Carlucci is approved.

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Florida International University, 2011

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DEDICATION

To Domingo and Magdalena Carlucci.

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I would like to sincerely thank all the people that made this work possible. To my Major Professor, Dr. Daniel B. Wright, thank you for your knowledge, guidance and for giving me the space I needed to execute this study. Also, Dan, thank you for your sense of humor, which made completing this work that much more enjoyable. To Dr. Steve Charman, Dr. Nadja Schreiber Compo and Dr. Oren B. Stier who provided invaluable feedback and support throughout the completion of this work. I would also like to thank the University Graduate School for supporting this work through a Dissertation Year Fellowship.

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Alex, I'm done with my paper!

## ABSTRACT OF THE DISSERTATION

### MEMORY CONFORMITY: ACTORS AND BYSTANDERS

by

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Florida International University, 2011

Miami, Florida

Professor Daniel B. Wright, Major Professor

This dissertation explored memory conformity effects on people who interacted with a confederate and of bystanders to that interaction. Two studies were carried out. Study 1 was conducted in the field. A male confederate approached a group of people at the beach and had a brief interaction. About a minute later a research assistant approached the group and administered a target-absent lineup to each person in the group. Analyses revealed that memory conformity occurred during the lineup task. Bystanders were twice as likely to conform as those who interacted with the confederate. Study 2 was carried out in a laboratory under controlled conditions. Participants were exposed to two events during their time in the laboratory. In one event, participants were shown a brief video with no determinate roles assigned. In the other event participants were randomly assigned to interact with a confederate (actor condition) or to witness that interaction (bystander condition). Participants were given memory tests on both events to understand the effects of participant role (actor vs. bystander) on memory conformity. Participants answered second to all questions, following a confederate acting as a participant, who disseminated misinformation on critical questions. Analyses revealed no significant differences in memory conformity between actors and bystanders during the movie memory task. However, differences were found for the interaction memory task

such that bystanders conformed more than actors on two of four critical questions. Bystanders also conformed more than actors during a lineup identification task.

The results of these studies suggest that the role a person plays in an interaction affects how susceptible they are to information from a co-witness. Theoretical and applied implications are discussed. First, the results are explained through the use of two models of memory. Second, recommendations are made for forensic investigators.



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## Chapter I

### Literature Review

#### *Applied Problem*

Legal psychologists and researchers have often focused on people's memory of a crime. However, there are benign interactions that can become focal points of a criminal investigation. Consider the Timothy McVeigh case. McVeigh is responsible for the 1995 bombing of the Alfred P. Murrah Federal Building in Oklahoma City, Oklahoma. McVeigh rented a van from Elliot's body shop two days before the bombing. While there, two people interacted with him and one person witnessed one of the interactions. First, McVeigh took care of some paperwork with Vicky Beemer. Second, he inspected the van he was to rent with Eldon Elliot while Tom Kessinger (a mechanic) witnessed the interaction. Two days later, when the truck he rented, filled now with explosives, exploded the events that took place in Elliot's body shop became an integral part of the FBI's criminal investigation. The scene that had taken place in Elliot's body shop included two actors (people who interacted with McVeigh) and one bystander (a person who witnessed one of the interactions with McVeigh). An FBI agent interviewed Beemer, Elliot and Kessinger regarding what they remembered about the man who had rented the truck two days before. Beemer and Elliot gave general descriptions of the man while Kessinger gave a more detailed account of the man. Because of these initial memory reports Kessinger was asked to describe McVeigh to a forensic artist so that a sketch could be sent out to other enforcement agencies around the country. Kessinger also told the FBI agent that he had seen another man with McVeigh that day and that he believed

they had acted together. A second sketch was drawn up and this sketch was also released to the national media. The FBI was now looking for two men.

Though Beemer and Elliot had not initially reported information about an accomplice, their stories soon began to change and they too reported seeing McVeigh with another man. In addition, Beemer and Elliot's stories became more detailed after repeated interviews. Beemer noted that she was not sure what the second man looked like but that she was sure he was there. Elliot described details, including the hat the second man was wearing. Memory conformity was likely a contributing factor in this case. It seems that the bystander (Kessinger) exerted influence on the actors (Beemer and Elliot) in the McVeigh case, causing memory distortions (Memon & Wright, 1999). It is important to note that the McVeigh case provides a real-world example of how different eyewitnesses can influence each other but does not provide definitive information about the direction of that influence. In this case the bystander influenced the actors but that may not always be the case. However, the case illustrates an important, yet neglected, issue regarding memory: Does the role someone plays in an interaction affect how susceptible he/she is to misinformation? This is the question the current studies seek to answer.

Human memory is fallible and can lead to innocent people being sent to prison and guilty people left free to commit other crimes. As of May 2011, 269 people have been exonerated through DNA testing ([innocenceproject.org](http://innocenceproject.org)). These cases have spurred much research because 75% of exoneration cases include faulty eyewitness memory. While laypeople may see the human mind as a video camera, capturing everything we experience, memory scholars know that this is not the case (Roediger, 1980). A multitude

of encoding and recall conditions can lead to memory errors. As a result, researchers have conducted experiments to understand which conditions can lead to these errors. An overwhelming amount of research shows that memory can be influenced by both situational and individual factors.

Over a human lifespan one learns to rely on others for information (Deutsch & Gerard, 1955). In fact, conformity is seen as an adaptive trait in some cultures (e.g., Japan), as it shows that one is tolerant and mature (Markus & Kitayama, 1994). Thus, people influence each other in many situations, including when they remember events. People can re-experience an event by remembering it with others and details may be added or removed, with little or no consequence (McIsaac & Eich, 2002). However, there are times when remembering needs to be accurate (e.g., in criminal investigations). Unfortunately, research shows that people sometimes incorrectly succumb to others' recollections when remembering important events in situations where accuracy is of utmost importance.

#### *Theoretical Perspective: Informational and Normative Social Influence*

Social psychologists often cite two influences that lead to conformity: informational and normative (Deutsch & Gerard, 1955). First, when information is not obvious, people will conform to others because they are unsure of themselves and use the group to glean the right answer (informational influence). Second, people conform because they do not want to rebel against the group (normative influence). A series of classic studies illustrate the conditions under which people may conform to others. In 1936, Sherif conducted an experiment showing informational influences on behavior. Participants were seated in a dark room fifteen feet away from a pinpoint of a light.

Participants then saw the light move. In reality the light did not move but as a result of the autokinetic effect, participants “saw” the light move erratically and eventually disappear. Participants were then asked to give an estimate of how far the light had moved. One day later participants were brought back to the laboratory where they were paired with two other participants. Each was asked to give an estimate (out loud) of how far the light had moved. Sherif noted that the groups began to compromise and that a group consensus was reached regarding the movement of the light. Because the movement of light was ambiguous the group members relied on each other for information about how far it had moved. These studies show the effect of informational influence: in the absence of a clear right answer people are more likely to succumb to what others say, which can lead them to be more correct or less correct depending on the situation. Of course, in Sherif’s experiment the light did not move.

Another set of experiments by Asch (1951) shed light on social influence in situations where a right answer *is* obvious. In Asch’s experiments each participant was seated 6<sup>th</sup> in a row of 7 people. Their task was to compare a standard line to three lines and report which matched. The right answer was obvious as the matching line was substantially longer and shorter than the comparison lines. Participants were asked to report their answers out loud in the order they were seated (i.e., person 1 through person 7). In the critical trial, confederates were instructed to pick the same obviously wrong answer. Asch found that approximately 75% of participants conformed at least once when confronted with several wrong answers. Those who answered each question alone (control group) matched the lines correctly more than 99% of the time. The correct answer was obvious yet participants still answered incorrectly because of social pressure

from the rest of the group. In fact, going against the group was so stressful that one participant had to excuse himself to vomit after each critical trial. The participant was sure of his answer and went against the group, but suffered physical consequences from the situation. In the Asch study, normative influence played a key role in the behavior of participants. Hundreds of studies have replicated these results – that informational and normative influences can affect how people act in groups. Indeed, social psychologists have documented how humans interact. In his seminal book, Aronson (1972) discussed the human mind and its need to interact with other human minds. We are social animals, he explained, and memory is no different.

Since the classic studies by Sherif and Asch much research has been done on conformity. Contemporary studies in conformity focus on three main reasons why people conform to others: to be accurate, to affiliate, and to maintain a positive self-concept (Cialdini & Trost, 1998). A meta-analysis by Bond and Smith (1996) showed across 133 studies in 17 countries that Asch-type line judgment tasks still led to some conformity. The results also showed that collectivist countries showed higher levels of conformity than individualistic countries. Studies in different areas of psychology show that people do as others do. Phillips (1985, 1989), for example, found that suicide rates increase after a highly publicized suicide. The increase happens only in places where the suicide story is publicized. Psychologists have documented similar patterns in reports of hijackings and UFO sightings (Bartholomew & Goode, 2000). Much research points to the following conclusion: If one person does it, others will follow.

### *Social Influence on Memory*

Sherif's and Asch's studies show that people are influenced by others in many different situations. Informational influences and normative influences affect conformity. Using this conceptualization of conformity, memory researchers have attempted to understand how social context could affect memory. Borrowing from the social-influence literature, memory researchers developed a theory about how people remember in social settings, known as the social-contagion of memory (Roediger, 1980; Roediger, Meade, Bergman, 2001; Meade & Roediger, 2002) or memory conformity (Wright, Self & Justice, 2000). Researchers found that remembering with others was detrimental to the accuracy of memory reports. The main finding in these studies was that information provided by a co-witness could be later recalled as *witnessed* information. Indeed, "false memories are contagious; one person's memory can be infected by another person's errors" (Roediger et al., 2001, p. 365).

As early as 1932 Bartlett wrote about the influence of others on one's memory. However, the social aspect of remembering was largely ignored during the behaviorist era which was dominant in US psychology. It was not until well into the 20<sup>th</sup> century that researchers began a systematic investigation of social influences on memory. For the past 35 years, Elizabeth Loftus and others have shown that introducing misinformation to people after an event can create memory errors on a subsequent memory test. This phenomenon has been termed the "post-event information effect" or the "misinformation effect." In past research, post-event information has been delivered via written narratives, suggestive questioning and other people (Loftus, 2005). In Loftus' original procedure participants were presented with an original event (e.g., a car crashes after running a stop

sign) and were then exposed to misleading post-event information (e.g., that the car passed a yield sign). At test, participants were asked to choose between the original information and the misinformation (e.g., the stop sign vs. the yield sign). Loftus found that individuals exposed to misinformation were more likely to report the suggested information than participants not presented with the errant information. Loftus originally posited that the misinformation effect occurred via an “overriding” of memory. Her explanation was that the original memories were overwritten by the misinformation such that at test the misinformation had replaced the original information and could no longer be recalled. In Loftus’ view the underlying reason for the error was strictly intrapersonal, not interpersonal.

McCloskey and Zaragoza (1985) introduced the modified test to investigate the misinformation effect. Unlike Loftus, they believed that people were not actually recalling the misinformation but rather succumbing to social pressure from the interviewer. They questioned whether the misinformation overwrites the original information and adjusted the recall scenario to allow a test of that. In addition, they proposed that the original misinformation paradigm may have led participants to select the piece of misinformation as a result of memory gap filling because they had no memory or a weak memory for the witnessed event and used the misinformation to fill in the gaps. McCloskey and Zaragoza tested this notion by exposing participants to an event (hammer), then exposing participants to misleading information (screwdriver) and finally testing participants with the original information (hammer) and new information (wrench). If the original information was selected instead of the new information then exposure to the misinformation did not “override” the original memory. Indeed,



McCloskey and Zaragoza found no evidence of memory impairment using this modified test suggesting that results obtained by Loftus were due to social demand characteristics or memory gap filling. In other words, they concluded that participants reported post-event misinformation due to what Belli (1989) calls “misinformation acceptance,” not because the original memory was overwritten. Importantly, these studies found that there was a social component in misremembering erroneous details.

Schneider and Watkins (1996) presented pairs of participants with words and subsequently gave them an “old/new” recognition task. The recognition task included previously seen words and new words (lures). The test was done in pairs, and they found that what the first person reported influenced what the second person reported. Misinformation provided by the first person lowered the hit rate (correctly identifying an old word as old) by 10% and raised the false alarm rate (incorrectly identifying an old word as new) by 20%. The Schneider and Watkins (1996) study inspired other researchers to investigate why this phenomenon occurred.

Roediger, Meade and Bergman (2001) published a paper about the social contagion of memory. Borrowing from the work of Loftus and classic conformity studies like those of Asch, Roediger and his colleagues attempted to understand how social context influenced memory. In their study a confederate (a research assistant working with the researchers) was used to disseminate misinformation so that social influences on subsequent recall could be measured. Two participants (one being a confederate) viewed complex scenes together (e.g., kitchen, closet, etc.) and then recalled specific details from each scene together. The confederate was trained to respond to some items correctly and to some items incorrectly. Using this paradigm Roediger et al. (2001) were able to

measure how much influence the confederate exerted in a recall task. The authors found that participants in the contagion condition (where participants heard incorrect information from the confederate) were more likely to make memory errors than those in the no-contagion condition (where participants did not hear incorrect information from the confederate). The results showed that participants were susceptible to misinformation encountered in a co-witness situation.

### *Memory Conformity*

At about the same time as the Roediger studies, another set of memory researchers began using the term “memory conformity” to describe the process whereby one person’s memory is affected by another’s memory (Wright, Self & Justice, 2000). In a recent article, Roediger argued that *memory conformity* is likely a better term for the phenomenon due to the negative connotations *contagion* inspires (2010) so *memory conformity* is the term used herein. When witnesses report information they received (directly or indirectly) from a co-witness then memory conformity has occurred. Co-witness conformity can have marked effects in the real world where crimes are often witnessed by more than one person. In fact, Skagerberg and Wright (2008a) conducted a survey of eyewitnesses who participated in lineups in the UK. They found that most witnesses saw the crime with other people and that more than 50% talked to co-witnesses about the crime. These figures underline a serious problem: people can “recall” erroneous details gathered from co-witnesses that are then passed on as accurate (or at least remembered) information. The problem is compounded by the fact that the legal system (from investigators to juries) relies heavily on eyewitness information and rarely questions the circumstances surrounding the information (e.g., co-witness contamination)

(Loftus, 1974; Wells, Memon & Penrod, 2006). Thus, researchers have set out to understand the conditions that lead to memory conformity in an effort to help investigators gather only the most accurate information.

Wright, London and Waechter (2010; Figure 1) developed a model of memory conformity using the social-influence literature previously discussed. They assert that informational and normative processes are important in social memory contexts. First, people conform because they do not want to disagree with others; disagreeing is costly in the social marketplace (normative influence). Second, people conform because they trust other people's memory more than their own memory (informational influence). Thus, the probability of responding with information gathered from another witness depends on several things, including, belief in memory (the person's and others') and the cost of disagreeing (including the cost of making an error). Several studies have investigated these mechanisms and how they affect memory conformity. Some of these studies are highlighted below.

#### *Memory Conformity Methodology*

Generally, there are three ways memory conformity research is conducted. First, pairs of participants are shown stimuli (e.g., pictures, words) and then tested on these together (Schneider & Watkins, 1996). The participants in these studies typically answer between 50 to 100 memory questions, so the number of data points for each participant makes this design powerful. The typical finding is that what the first person reports affects what the second person reports, that is, the second person conforms, at least some of the time, to the first person. A second strategy is to use a situation that is analogous to an eyewitness experience. Participants view a mock crime and are encouraged to discuss

details of the event with another participant (Gabbert, Memon & Allan, 2003). In some cases researchers have used confederates to disseminate errant information. Using confederates is a way of controlling the type of information given to participants. The typical finding in these studies is that some of the errant information gathered from a co-witness or confederate is later recalled as witnessed information. These designs more closely mimic the real world but are less powerful because participant memory is tested only for a few items. The third research approach provides participants with feedback about the answers other people have provided. For example, a participant may be told either that 90% or 30% of other people questioned said the same thing (Skagerberg & Wright, 2009). Research designs that use confederates provide normative influences while research designs that use feedback provide informational influence. Using these designs researchers have shown that both informational and normative influences affect memory, though in some studies it is difficult to discern which influence has more of an impact on memory.

#### *Normative Influence on Memory*

Recall that one of the reasons people conform is to affiliate with others. People want to be liked and sometimes conform to be accepted by others. Using this conceptualization of conformity, Wright, London and Waechter (2010) found that normative influence affects memory conformity. They found that two components of social anxiety (fear of negative evaluation and social avoidance) moderated the memory conformity effect. Participants in this study completed a *Social Anxiety Scale for Adolescents* (SAS-S; La Greca & Lopez, 1998) and also completed a memory conformity task. After completing the SAS-A pairs of participants saw the same 50 faces.

Participants then completed a memory test where they had to denote, on the same sheet, whether the picture was 'old' or 'new'. Participants were randomly selected to always go first or always second on the 100 trials. The findings revealed that fear of negative evaluation scores were positively correlated with memory conformity. Participants who had a higher level of fear of negative evaluation were more likely to conform to their memory test partners. This study suggests that the way individuals perceive the cost of disagreeing is an important component in memory conformity. Furthermore, it shows that normative influence is an important mechanism in memory conformity. In the La Greca and Lopez study (1998), the socially anxious participants who exhibited fear of negative evaluation were less likely to go against a co-witness, ostensibly for fear that they would be looked at negatively and thus, conformed more compared to the socially anxious participants who exhibited social avoidance.

In another study, Skagerberg and Wright (2008b) found that manipulating power roles affected memory conformity. They had pairs of participants look at 50 faces on a computer screen and then engage in a power task. The power task required that one participant designed a restaurant (designer role) in 5 minutes and that the other participant judged the restaurant (judge role) design on several dimensions (e.g., originality, practicality, etc.). The participants were randomly assigned to be either the designer (low-power role) or the judge in the task (high-power role). Following this procedure the participants completed a memory test for the previously seen faces. All answers were recorded on the same sheet to allow the second person to see what the first person wrote. The results of this study showed that low-power participants (designers) were more influenced by high-power participants (judges) than vice versa. Normative

influence is one possible explanation for the findings. It is possible that the low-power participants felt more pressure to agree with the high-power participant and conformed to avoid negative evaluation. The Skagerberg and Wright (2008b) study is particularly relevant to the proposed studies as it shows that the role someone plays in an event can affect how susceptible they are to misinformation.

### *Informational Influence on Memory*

Other studies have looked at informational influence on memory conformity. Informational influence is often exerted when a person is not sure of their answer and looks towards others in the group for the right answer. Gabbert, Memon and Wright (2007) manipulated perceived encoding duration in a memory conformity experiment. People who were tested in pairs were told that one person had encoded a set of pictures for either half or twice as long as the other person. However, encoding time was the same for all participants. Participants who were told they had less encoding time were more likely to conform to their partner than those who were told that they had more encoding time. That is, memory conformity was larger because of the belief that the other person had more accurate information to report, leading to memory conformity. They showed that an individual's beliefs about the quality of their own memory in comparison to another person's memory affected memory conformity.

In another study, Wright, Self and Justice (2000, Exp. 2) showed pairs of people slightly different photographs of a crime scene. The critical difference was that one participant saw the criminal with an accomplice while the other participant saw only the criminal. Following the photographs participants completed an individual memory test that asked them about the critical detail (whether there was an accomplice or not) and

their confidence for that question. Participants were then told to discuss the details of the photographs they had seen. Following discussion each person was asked if there was an accomplice. The authors found that 75% of groups conformed within the pair regarding the accomplice question. The person who conformed tended to have lower confidence than the person who did not conform. The extra confidence exerted by the participant may have served as a cue to accuracy. The results of this study show that informational influence, again, plays a role in how people report their memory. That is, if one person believes another person's memory is more accurate (through cues such as confidence) then the person is more likely to conform to the other, more accurate, person than vice versa.

Taken together, these studies show that there are social-influence mechanisms at work in memory conformity. The probability of conforming to another's memory depends on the cost of disagreeing (normative influences) and belief in memory (informative influence). Memory researchers hope that understanding these mechanisms may lead to more information about when memory conformity happens and how to decrease memory conformity in situations where it might be detrimental (e.g., criminal investigations).

### *The Current Studies*

For the purposes of these studies, actors (or interlocutors) are described as people who interact with a target and bystanders are described as people who witness that interaction. The current studies propose that these two roles will have different levels of memory conformity. A few studies have investigated memory of actors and bystanders outside the memory conformity literature. The focus of these studies is often victims of a

crime versus bystanders to a crime and thus, confound the results of these studies.

Nevertheless, the results of these studies have been inconsistent. Some studies show that actors are more accurate in lineup identifications than bystanders (Hosch & Cooper, 1982) while others show that bystanders are more accurate (Kassin, 1984).

Hosch and Cooper (1982) investigated victimization as a determinant of eyewitness accuracy. Participants were run in pairs where one subject was the victim of a crime (personal vs. impersonal) and the other was a witness to that crime. A control condition was included for comparison purposes. After the crime occurred participants were asked to pick the thief out of a lineup. There was a significant difference between the theft conditions and the control condition such that participants in the theft conditions had the highest lineup accuracy. Participants in the control condition had the poorest accuracy. The authors argue that the results were due to the amount of attention participants gave to the thief. That is, a criminal act is likely to command attention leading to better encoding of the confederate and subsequent lineup performance. This may also be the case in more innocuous/non-criminal events where one person's attention is focused on a target and another person's attention is not.

Kassin (1984) also investigated eyewitness performance for victims and bystanders. In his study 15 pairs of participants were seated at a table where they played a risk-taking competitive game. During the game a confederate entered the room and stole the game money from one of the participants (victim) while the other participant watched from across the table (bystander). All participants were given a lineup identification task that they completed by themselves. Approximately half of the bystanders correctly identified the thief in a lineup while none of the victims made an accurate identification.



Thus, in this study bystanders had superior accuracy, albeit with a small sample size. The problem with the two studies described above is that they investigate eyewitness lineup performance for victims of a mock-crime versus bystanders to that crime and thus, tell us little about how memories for other types of events are affected by actor and bystander roles. They also tell us little about memory for victimless events for actors and bystanders.

In terms of memory for events, the results are also inconsistent. Ihlebaek, Love, Eilertsen and Magnussen (2003) had participants either actively engage in a staged robbery or watch a staged robbery on video. They found that participants who viewed the video of the robbery (peripheral witness) were more accurate when recalling the event than participants who engaged in the robbery (central witness). However, in this same study the authors found that level of involvement also had an effect on accuracy such that witnesses close to the scene had greater accuracy than witnesses further away from the scene. One reason for the inconsistent results may have to do with the methods employed. First, two of the three studies show observers to be more accurate using videos to show stimulus materials instead of live events. The fact that actors and bystanders in those studies encoded information through different sources (live event vs. video) may have affected how participants encoded the information and thus, the accuracy of their memories. Indeed, the authors concede that the level of involvement was correlated with accuracy. One could argue that the level of involvement between live events and watching a video are different and may lead to different memory performance regardless of the role (central vs. peripheral) the witness played in the event. Thus, it is difficult to extrapolate any conclusions from the results of the study.

In one of the few field studies on actors and bystanders, Woolnough and MacLeod (2001) found that actors and bystanders were equally accurate in their accounts of a real crime. Fourteen witnesses of a robbery at a supermarket were interviewed 3 months after the crime. The authors used surveillance video to establish ground truth and assess memory accuracy. They calculated accuracy rates for central witnesses (those who were involved in the event and questioned by police) and peripheral witnesses (less involved and not questioned by police) and found no differences in accuracy between these two groups, though central witnesses did provide *more* information.

None of the studies reviewed above examine memory (or memory conformity) for actors and bystanders in a victimless event. However, there are forensically relevant events that do not include victims, but rather people who interact with a target and those who witness this interaction. How this differentiation affects memory and memory conformity, in particular, is a topic that has received little empirical attention.

#### *Actors and Bystanders: Memory Conformity*

Little information is currently available regarding memory conformity for actors and bystanders in an event. Researchers have, however, investigated memory for people *performing* an action and people *observing* an action. In a typical study, participants are instructed either to perform an action (e.g., put the letter in the envelope) or to observe another participant performing that action. All participants are then given a memory test. Numerous studies show that self-performed tasks are better remembered than observed actions (Engelkamp & Zimmer, 1985; Manzi & Nigro, 2008). One could argue that self-performed actions are better remembered (i.e., create stronger memories) and thus, are less likely to lead to conformity as one component of memory conformity is

informational influence (Roediger et al., 2001; Wright, Self & Justice, 2000). That is, a person who has a better memory for an event may be less susceptible to influence from a co-witness.

Belief in one's memory seems to be a critical variable in memory conformity. Even just thinking that one has a better memory may buffer people against the memory conformity effect. Gabbert, Memon and Wright (2007) found that people who *thought* they had encoded information for longer were less likely to conform than people who thought they had encoded the information for less time. One explanation for this finding is that people who believed they had encoded information for longer also believed they had better memories, leading to less memory conformity.

As mentioned, no studies have looked at memory conformity for actors and bystanders. However, the practical significance of this issue requires further attention. Some criminal investigations may involve both people who interact with a target (actors) and witnesses to that interaction (bystanders). Unfortunately, we have little information about how actors compared to bystanders behave when confronted with misleading information. This information could be of great value to law enforcement officials when gathering information about a crime. For example, they may weigh information from actors and bystanders differently if one of them is more likely than the other to conform. Thus, the results of the current studies have applicable value. Theoretically, the current studies will expand the literature on memory conformity, thereby expanding the currently available theories of memory. The results will be discussed in terms of current models of memory conformity. Study 1 was conducted as a field study to maximize ecological

validity. Based on the results of Study 1, Study 2 was carried out in a laboratory setting with additional variables of interest.

## Chapter II

### Study 1

Study 1 compared memory conformity effects of people who interacted with a confederate, and of bystanders to that interaction. The study was carried out in the field in an effort to mimic real-world conditions (increase ecological validity). A naturalistic setting was used to assess memory conformity for people who, at the time of encoding, do not know they are participating in a psychological study.

#### *Participants*

People were approached by a male confederate at a public beach in South Florida. Three hundred and ninety-three participants, within 176 groups, took part in the study. The mean age was 30 years and fifty-six percent of participants were female. Most groups were of two people (86%).

#### *Procedure*

A confederate (see Figure 1) approached a group of people and asked one person for the time. This interaction lasted about 10s to 15s, depending on how long it took a person to answer the question. After about a 1-minute delay (to allow the confederate to be out-of-sight) a research assistant approached each group, introduced themselves as a researcher, and asked if they would participate in a research study. If participants agreed to participate they were given a consent form to read and sign (see Appendix A). Once consent was given the research assistant continued with the study. Depending on the condition, the research assistant spoke either the “actor” (the person the confederate spoke to) or the “bystander” (the person who witnessed the interaction between the actor and the confederate) first. To illustrate, in a typical “actor” condition, the research

assistant approached the group and asked the person who previously interacted with the confederate to pick the man that had just asked for the time out of the lineup. After recording this information, the research assistant turned to the other group member (in this example, the bystander) and then asked them to pick the man out of the lineup. The same procedure was followed for the “bystander” condition, except that in this case, the research assistant asked the bystander in the group for an identification first and before getting an identification from the actor in the group. Using this design we could later test if the actor or bystander exerted more influence on the second respondent. The research assistant then held up the target-absent lineup and, in front of the other group member, asked the person to: “Pick the man that asked for the time out of this lineup”. The research assistant repeated the question for the other member of the group. Gender and age information were recorded and groups were debriefed and thanked for their participation.

### *Materials*

#### *Lineup*

The target-absent lineup (see Figure 1) was made using general facial characteristics of the confederate. The lineup was pretested to ensure that none of the six fillers stood out. The lineup was printed in color. A target-absent lineup was used to ensure that no individual choice stood out. A target-absent lineup was used to ensure that misinformation was always provided to other participants. Laboratory studies often use confederates to disseminate misinformation but this was not an option in the current study because it was carried out in a naturalistic setting. Thus, using a more difficult task (e.g., target-absent lineup) allowed us to look only at conformity trials during our

analyses. For example, say 90% were choosing person A (actual target), then 90% of the second responders would be in a position where conforming could be due to conforming or memory. This would leave only 10% of the sample which would not allow us to disentangle these two mechanisms. This would be too small a sample.

### *Analyses*

Because most groups consisted of two people (86%), our analyses included the first two people in each group only. A chi-square test was used to test the association between what the first person said and what the second person said. This analysis will reveal which person (bystander vs. actor) exerted more influence during the lineup identification task.

### *Hypothesis*

The main hypothesis for this study is that bystanders will conform more than actors on the lineup identification task. That is, actors will exert more influence on bystanders than vice-versa.

### *Results*

Because most groups consisted of two people (86%), our analyses will be just of the first two people in each group. Table 1 shows the responses of the first person with the responses of the second person. A chi-square test was used to test the association between what the first person said and what the second person said. The  $\chi^2$  refers to residual  $\chi^2$  of the no association model, so 71.31 is a measure of association. It is statistically significant, likelihood ratio  $\chi^2(36) = 71.31, p < .001$ , Cramér's  $V = .27$ . This shows that what the first person said affected what the second person said. Most of this association is due to large values on the diagonal (in bold italics) corresponding to when

the second person gave the same response as the first person said. If the  $\chi^2$  test is re-run with the expected values for the diagonal entries being the observed values, the model fits well,  $\chi^2(30) = 32.94, p = .33$ . This is a significant improvement,  $\chi^2(6) = 38.37, p < .001$  over the previous model. This shows that the association between what the first person says and what the second person says is due to the second person conforming, and not some other anomalous pattern. About half of the residual  $\chi^2$  is accounted for by the second person making the same choice as the first person.

Table 2 shows how often the second person gave the same response as the first person, broken down by whether the second person was a bystander or not. If people were randomly guessing among six choices, we would expect only 17% conformity. In total, 34% of the time, the second person gave the same response as the first person. Importantly, 44% of bystanders conformed while only 24% of the people who interacted with the confederate conformed,  $\chi^2(1, N = 176) = 7.67, p < .01$ . This is an odds ratio of 2.45, 95% confidence interval from 1.29 to 4.64. This shows that bystanders to the interaction were twice as likely to conform as people who spoke directly to the confederate.

It was hypothesized that actors would exert more influence on bystanders during the lineup identification task in this study. The results of the study confirm this hypothesis. There was an association between what the first person responded and what the second person responded. When participant role was analyzed the results revealed that bystanders were more than twice as likely to conform to an actor than vice-versa.



## *Discussion*

Study 1 investigated memory conformity for actors and bystanders in the field. A confederate approached a group of people on a public beach and interacted with one person in the group for a short period of time. Actors in that interaction and bystanders to the interaction were then presented with a target-absent lineup and were asked to make an identification. Analyses showed a memory conformity effect such that there was an association between what the first person said and what the second person said. In other words, the first respondent's lineup identification influenced the second respondent's lineup identification. Further analyses revealed that bystanders were twice as likely to conform as people who engaged in the interaction (actors). This may shed some light as to how memory conformity works in naturalistic settings and it has important implications.

One possible reason for the findings of Study 1 is that actors pay more attention than bystanders. Attention is important in encoding and hence later remembering. Details that receive little visual processing are poorly remembered (Posner, Snyder & Davidson, 1980). Research on eye movement shows that eye fixations are correlated with memory. We remember what we look at the most (Buswell, 1935). Actors in this study were forced to pay attention to the confederate because something was asked of them (i.e., the time). The request shifted visual attention to the confederate and may have enhanced memory. Such pressure was not placed on bystanders in this study.

Study 1 provides rich information about how actors and bystanders react when given misinformation during a lineup identification task. However, there are methodological constraints associated with field studies that limit the scope of the results. Study 2 was

designed to rectify some of the major methodological concerns of study 1 and to expand the findings to situations other than lineup identifications. First, study 1 included a target-absent lineup only, giving researchers little information about what occurs when participants are presented with a target-present lineup. Study 2 included both a target-present and a target-absent lineup. Second, it may be that the results in study 1 were due to other influences that the researchers could not control in the field. Study 2 provided more experimental control as it was conducted in a laboratory. Third, study 1 included only one memory task (a lineup identification) due to constraints inherent in field studies. Study 2 included several memory tasks that facilitated richer comparisons. Fourth, the groups that participated in study 1 knew each other, meaning that there may have been other social dynamics at play that lead to memory conformity. Participants in Study 2 completed the experiment with a confederate-participant, whom they were not acquainted with. Thus, dynamics inherent in friendships that may affect memory conformity could not interfere in study 2. Fifth, bystanders in study 1 were not required to provide attention to the confederate. Study 2 was designed so that both bystanders and actors were under the same attentional conditions to ensure that the only difference between roles was who spoke directly to the confederate.

## Chapter III

### Study 2

Study 2 investigated memory conformity for actors and bystanders in a controlled laboratory setting.

#### *Participants*

Two hundred and thirty-six participants were recruited from the Psychology department at Florida International University. Participants signed up for the study using SONA systems and received 1 credit of research participation. Participants were mostly female (74%) and Hispanic (67%) and were between the ages of 16 and 54 with a mean age of 21 (SD = 5 years). Participants under 18 years of age were required to turn in a Parental Consent Form as per FIU Institutional Review Board guidelines.

#### *Design*

The study used a 2 (lineup: target-present vs. target-absent) by 2 (confederate response: right vs. wrong) by 2 (role: actor vs. bystander) factorial design. Participants were exposed to two events during their time in the laboratory: a control event (a film) and the critical event (interruption from a confederate). Participants were given memory tests for both of these events and also engaged in a lineup identification task.

#### *Procedure*

Upon arrival at the laboratory participants were be given a consent form (Appendix B), which they read and signed to participate in the study. Participants were seated at a table with another participant (Confederate 1). All participants filled out a Demographic Questionnaire (Appendix C). The research assistant explained that they were going to view a brief video and that she would be back at the end of the video. The

research assistant stepped out of the room and the participants viewed an 11-minute documentary about the future. At the end of the video a female confederate (Confederate 2) entered the laboratory and spoke to the person sitting closest to the door. Half of the time the person sitting closest to the door was the participant (Actor Condition) and half of the time it was confederate 1 (Bystander Condition). The female confederate memorized a script in which she disseminated information that would later be used to measure each participant's memory for that portion of the experiment (See Appendix D for script). This interruption lasted approximately one minute. About a minute after Confederate 2 left the room the Research Assistant came back and began the memory test portion of the study by asking participants to pick a piece of paper out of a cup that would determine who got to answer first and who got to answer second. This was arranged so that both papers said "2" but Confederate 1 was trained to say they picked a "1" from the cup. This assured that Confederate 1 always answered memory questions first and the participant always answered memory questions second. The Research Assistant began the memory test by asking participants six questions about the video they had previously watched (Appendix E). For every question Confederate 1 was instructed to answer first and the participant was instructed to answer second. All questions were answered out loud. The research assistant recorded verbatim answers given by the confederate and participant on a sheet of paper. Confederate 1 was trained to always answer questions 1 and 3 correctly (to diminish suspicion) and half the time answered either questions 2 and 5 correctly (4 and 6 incorrectly) or 4 and 6 correctly (2 and 5 incorrectly). After both participants answered the six questions about the video the Research Assistant explained that the woman who had interrupted the study was part of the study and that she was now

going to ask them a series of questions about what the woman said (Appendix F). Again, for every question Confederate 1 was instructed to answer first and the participant was instructed to answer second. All questions were answered out loud. The research assistant recorded verbatim answers given by the confederate and participant on a sheet of paper. Confederate 1 was trained to always answer questions 1 and 3 correctly and half the time answered either questions 2 and 5 correctly (4 and 6 incorrectly) or 4 and 6 correctly (2 and 5 incorrectly). After both participants answered the six questions the Research Assistant gave participants a lineup from which to choose the girl who interrupted the study. Confederate 1 was instructed to pick someone from the lineup and to state their confidence in their decision on a scale from 1 (not confident) to 10 (very confident). Half of the time Confederate 1 was very confident in their decision (“I am an 8 on a 1-10 scale”) and half of the time they were not very confident in their decision (“I am a 2 on the 1-10 scale”). These decisions were made out loud and the participant could see and hear the lineup identification Confederate 1 made. In the Target-Absent condition the confederate picked each member of the lineup an equal number of times. In the Target-Present condition the confederate picked the right person half of the time and picked a filler the other half of the time. The participant was asked to pick someone out of the lineup immediately after the confederate completed their identification. The Research Assistant then asked participants to complete the final questionnaire (Appendix G – Cost of Disagreeing). Once participants had completed that questionnaire they were asked two suspicion questions (Appendix H): 1. What do you think this study is about? 2. Do you feel like you were deceived or were you suspicious about anything during your time in this study? The Research Assistant recorded the participants’ answers to these questions

and proceeded to the debriefing portion of the experiment (Appendix I). After debriefing participants had an opportunity to ask questions about the study. When all questions were answered participants were thanked for their time and given credit on SONA Systems.

### *Materials*

#### *Video*

The video was adapted from the documentary, *2057*, which depicts how humans will live 50 years in the future. The documentary is approximately 50 minutes in duration but was edited to 11-minutes for the purposes of this experiment. The video shows the life of a young boy and his mother in the future and there is commentary from scientists in between these scenes. The video was chosen for several reasons. First, it included a great deal of information that made it possible to construct a memory questionnaire to test participants' memory for the video. Second, we anticipated that not many people would have seen the documentary before completing the study. In fact, only one participant reported having seen the video outside of the experiment.

#### *Target-absent lineup*

To construct a target-absent lineup ten people were asked to describe each of the two confederates used in the study. Using this information a target-absent lineup was constructed by finding fillers that fit the general description of the target. The target-absent lineup was pre-tested using twenty people to ensure that no one stood out from the lineup. Each participant was given a description and asked to pick someone out of the lineup. No person stood out from the lineup.

### *Target-present lineup*

The target-present lineup was constructed by replacing foil number 6 on the target-absent lineup with a picture of the target.

### *Cost of disagreeing questionnaire*

The questionnaire (Appendix G) was adapted from Carol, Eaton, Carlucci & Wright (manuscript in preparation) to assess participant's feelings about the cost of disagreeing. The questions were designed to understand if participants were more concerned about being right or more concerned about being liked by others. The scale for each question ranges from 1 to 7, with lower scores indicating a desire to be right and higher scores indicating a desire to be liked.

### *Analyses*

The main goal of the study was to see who exerted more influence: actors in an event or bystanders in an event. The main variable of interest was whether the participant conformed to what the confederate said. Each participant was randomly assigned to the actor role or bystander role. After both events (documentary and interruption) participants were given a memory test and a lineup task where the confederate delivered either correct or incorrect information. Since the dependent variable is dichotomous (conformity/no conformity) logistic regression was used. Mixed logistic regression is used to predict the dependent variables on the basis of several independent variables. The current study included multiple items. One advantage is that several predictor variables (numerical or categorical) can be included in the regression. This allowed the researcher to determine the relative importance of the independent variables, and to assess any interaction effects that may exist.

## *Hypotheses*

*Hypothesis 1:* There will be no differences in memory conformity between bystanders and actors on memory for the movie.

*Hypothesis 2:* Bystanders will conform more than actors on memory for the interaction than memory for the movie.

*Hypothesis 3:* Bystanders will conform more than actors on the lineup identification task.

## *Results*

### *Manipulation Check*

Participants were asked two questions during a suspicion probe. For question 1 (“What do you think this study is about?”), 76% mentioned topics unrelated to the nature and hypotheses of the study. For question 2 (“Do you feel like you were deceived or were you suspicious about anything during your time in this study?”), 82% said they did not feel deceived or suspicious during the study. None of the participants mentioned the participant-confederate as a source of suspicion so no participants were dropped from the analysis. The results of the cost of disagreeing questionnaire (below) also show the manipulation did not change how groups reported the cost of disagreeing.

### *Cost of Disagreeing Questionnaire*

Participant’s answers to the cost of disagreeing questionnaire were used to determine if they could be used as a scale to measure if participants were more concerned about being right or more concerned about being liked by others. The first step in assessing the scale was to look at the correlation between all items. A correlation matrix revealed all items were significantly correlated with at least two other items, suggesting



reasonable collinearity. Next, a principal components analysis, a mathematical procedure that allows for variable reduction, was conducted to assess if the items represented one underlying component. All items had a loading above .4, meaning that each item mapped on to one underlying component. The scale ranges from 1 (more concerned with being right) and 7 (more concerned with being liked). Items 1 and 5 were reversed scored to adhere to this scale. Next, the reliability index Cronbach's alpha was computed. Cronbach's alpha was .569, showing moderate reliability. All of these measures indicated that the five items were measuring one underlying construct. Using this information we used the average score on the five items as a scale of conformity for each participant. The mean score on the conformity scale was 2.92 (SD = .926). The mean score for participants assigned to the bystander role was 2.93 (SD = .92) and the mean score for participants assigned to the actor role was 2.90 (SD = .93). This difference was not statistically significant,  $t(231) = -.310, p = .90$ .

#### *Logistic Regression*

Logistic regression was used to analyze most of the data. An advantage of logistic regression is that it allows the researcher to predict binary data (Wright & London, 2009), which is useful in the current study as the main variable of interest is whether the participant agrees or disagrees with the participant-confederate. A repeated measures logistic regression, using the R package lme4, was used to examine multiple dependent variables.

#### *Movie Questions*

A model including the confederate's answer to the movie questions showed that participants were more likely to be right if the confederate responded with the correct

answer. Participants were more likely to be wrong if the confederate gave an incorrect answer,  $\chi^2(1) = 36.0, p < .001$ . The results show a memory conformity effect such that participants agree with the confederate. Next, a model was constructed to include participant role (actor vs. bystander). There were no main effects for participant role,  $\chi^2(1) = 1.5, p = .22$ . Next, a model was constructed to test for interactions between memory conformity and participant role. Specifically, this model tested whether participant role moderated the memory conformity effect, which is measured by whether the confederate's response affects the participant's response. Results showed that memory conformity was not moderated by participant role for the movie questions,  $\chi^2(1) = 2.0, p = .16$ .

#### *Interaction Questions*

Table 3 shows a summary of the data for all interaction questions. Results showed that participants agreed with the confederate but this effect was moderated by the role the participant played and by questions,  $\chi^2(3) = 69.1, p < .001$ . To see where these differences occurred, models that included each critical question were constructed. Results showed that for questions 2 and 4, participant role was significant. For question 2, bystanders were more likely to agree (35% for bystanders vs. 22% actors). For question 4, bystanders were more likely to agree with confederates (19% for bystander vs. 6% for actors). There were no significant differences between actors and bystanders for the other two critical questions (see Table 3).

#### *Lineup Task*

A logistic regression was conducted to assess performance on the lineup task. Table 4 shows a summary of the data.

### *Target-present lineup*

Lineup agreement (whether the participant agreed with the confederate's choice) was influenced by the lineup decision of the confederate (right vs. wrong) and by the participant's role (actor vs. bystander). Memory conformity was found such that participants were likely to agree with the confederate,  $\chi^2(1) = 48.3, p < .001$ . Participants were more likely to agree with the confederate if they were bystanders than if they were actors,  $\chi^2(1) = 4.1, p = .04$ .

### *Target-absent lineup*

Lineup agreement (whether the participant agreed with the confederate's choice) was influenced by the lineup decision of the confederate (right vs. wrong) but not by the participant's role (actor vs. bystander). Memory conformity was found such that participants were likely to agree with the confederate,  $\chi^2(1) = 5.4, p = .02$ . Participant role had no influence,  $\chi^2(1) = .04, p = .83$ .

### *Discussion*

Study 2 included two events, which allowed the researcher to compare memory processes for an event where people were not in any determinate role and an event where people were randomly assigned a role (actor vs. bystander). Participants viewed an 11-minute movie together during which no roles were assigned and also were exposed to a target and accompanying information in a specific role (actor vs. bystander). This allowed the researcher to compare two events where one predicted participant role (actor vs. bystander) would moderate the memory conformity effect and one predicted participant role would not moderate the memory conformity effect. The movie portion of the study, in effect, served as a control condition and manipulation check.

Similar to the results of study 1, the results of study 2 suggest that the role someone plays in an interaction does affect how susceptible they are to information delivered by a confederate. The results of the memory test for the movie questions showed the typical memory conformity effect. A multilevel logistic regression was conducted and it showed that participants agreed with the confederate when the confederate was correct and incorrect. No significant effects were found for participant role. This result confirms hypothesis 1 – that participants would not differ in memory conformity for the movie memory questions.

The critical event was the interruption of the study by a confederate. It was during this task that participants were either directly spoken to by the confederate (actor condition) or witnessed this event (bystander condition). Based on results from study 1 it was hypothesized that bystanders would conform to actors on a subsequent memory test for the interaction. The results of the memory test for the interaction questions showed typical memory conformity effects but they were moderated by participant role, such that bystanders were more likely to agree on two of four critical questions. This result partially confirms hypothesis 2 – that participants assigned to the bystander role would conform more than participants assigned to the actor role for the interaction memory questions. The differences in memory conformity for the two events shows that the role participants played affected how likely they were to conform to a confederate.

Study 2 included a lineup identification task where the participant was asked to pick the person who interrupted the study out of a lineup. The participant heard the lineup identification made by the participant-confederate. The results for the lineup task follow the same pattern of results as the memory for the interaction. In the target-present lineup

participants showed the typical memory conformity effect. More importantly, participants were more likely to agree with the confederate if they were bystanders than if they were actors. This result partially confirms hypothesis 3 – that bystanders would conform more than actors during the lineup identification.

The results of study 2 provide information about memory processes during collective remembering tasks. The results also expand the finding to memory for an event and for several pieces of information. Participants who were bystanders in the interaction were more likely to conform to questions regarding the interaction than during questions regarding the movie they viewed. This suggests that interacting with a target and witnessing an interaction with a target leads to differing levels of memory conformity.

The results of study 2 can be explained using the concepts of normative influence and informational influence on conformity. The results suggest that normative influence did not play a big role in memory conformity. First, all participants (regardless of role) reported that they would rather be correct than be liked on the cost of disagreeing questionnaire. Second, we did not find any significant interactions in the movie memory task. If participants were concerned about being liked or affiliating with the other participant they would have conformed on both tasks but they only conformed on the interaction memory task. Third, participants conformed to 2 of 4 critical questions in the interaction memory task. If they were conforming due to normative influence they would have conformed to all critical questions at a similar rate. Thus, it seems as though informational influence played a part in how participants conformed in this study. Indeed, it may be that bystanders felt that actors had more information or paid more attention to the person that interrupted the study. This may have created a reliance on the other

participant's memory which may manifest itself as memory conformity on more difficult questions. In terms of Wright et. al. (2010) memory conformity model, it may be that bystanders believed the other participant had better memory for the event and conformed in an effort to be correct.

As with many laboratory studies, one limitation of study 2 is that the participants may have conformed because they found the task somewhat innocuous. Conforming about details regarding a movie or a seemingly random interruption may differ from conforming about details regarding a bank robber or other criminal scenario. However, there is mounting evidence that different roles can lead to different memory processes, including memory conformity (Skagerberg & Wright, 2008b). Indeed, the results of study 1 show that memory conformity is more pronounced for bystanders in a naturalistic setting.

A second limitation of study 2 is that the design of this study does not allow the researcher to discern differences between normative and informational influences. In an effort to make the study more ecologically valid all memory tests were conducted in front of the participant-confederate. We also cannot be sure of participant's beliefs in their memory and other's memory as this was not measured. Nevertheless, the goal of the study was to understand how actors and bystanders would react when confronted with misinformation from a co-witness. Finally, study 2 included constrained dialogue. Memory conformity effects may differ depending on the type of information being recalled and the length of interaction. Future studies may opt to include extended interactions and more naturalistic dialogue.

## **Chapter IV**

### General Discussion

The goal of the current studies was to assess differences in memory performance for actors and bystanders of an event. Both real-life cases (e.g, Timothy McVeigh) and field studies (Skagerberg & Wright, 2008) illustrate the importance of this line of research. Crimes witnessed by more than one person are prevalent and research shows that people do often discuss details of an event with others who witnessed that event. Unfortunately, the results of these discussions can lead to memory errors that may affect actual investigations. In these studies, the question of interest was whether playing a different role in an event would lead to more or less memory conformity.

Very little research has examined how interacting with a target versus witnessing that interaction affects memory processes. Most of the available literature has focused on the memory processes for victims and bystanders (Hosch & Cooper, 1982; Ihlebaek, Love, Eilertsen & Magnussen, 2003; Kassin, 1984; Woolnough & McLeod, 2001). However, not all criminal situations include victims. Thus, it is important to understand memory processes of people who interact with a target and those who witness this interaction. Of particular interest was the amount of memory conformity displayed by participants in these roles.

The results of study 1 and study 2 can be applied to real-world cases and suggest that the role someone plays in an interaction may affect their susceptibility to information gathered from a co-witness. Think of a stereotypical bank robbery where the bank robber speaks directly to a teller while others witness this interaction. Any discussion after the bank robber has left could lead to memory conformity and memory errors. The teller may

leak erroneous information about the bank robber that can later be reported by bystanders as witnessed details. Thus, it is not only important to emphasize the importance of preventing post-event discussions but also knowing what the memory risks are if post-event discussions have occurred.

Many criminal cases hinge on eyewitness evidence such as positive identifications from the witness on a lineup task. A lineup task was also included in the current studies as the results could have applied value. Results of these studies show that bystanders are more likely to conform to actors in both target-absent and target-present lineups. In study 1 it was found that bystanders were twice as likely to conform on a target-absent lineup than actors. Study 2 showed that memory conformity was higher for bystanders in target-present lineups. In fact, 22% of bystanders conformed to an incorrect answer from a confederate while only 11% of actors conformed to an incorrect answer from a confederate. This difference was statistically significant. These results suggest that investigators need to take the role someone plays in an interaction into account when weighing lineup ID's. The results of study 2 are especially sobering as they suggest that almost a quarter of bystanders opted to pick a filler even when the target was in the lineup.

Finally, the results of study 1 and 2 are particularly notable as they are based on both a college student sample and a real-world sample. One critique of psychological research is that it is often done under contrived conditions with a specific sample (college students). Study 1 provides information gathered in a naturalistic setting with members of the community, showing that memory conformity for actors and bystanders occurs outside of the laboratory as well.



### *Toward a Model of Memory Conformity*

Many studies have explored individual components that can lead to memory conformity. Wright, London and Waechter (2010) proposed a model that encompasses what researchers believe to be the important elements in memory conformity research, but it lacks quantitative predictability. The model uses the cost of disagreeing, cost of making an error, belief in other's memory and belief in one's memory to make predictions about the probability of conforming. It is often difficult separate these components so some studies have focused on the "cost" portion of the model and others have focused on the "beliefs" portion of the model.

The results of the current studies show that these elements manifest themselves in different ways. For example, one reason bystanders may have conformed more was due to pressure to agree with someone they believed had a better memory for the interaction. That is, their beliefs in their own memory and the other participant's memory caused them to conform.

Charman, Carlucci, Vallano and Hyman-Gregory (2010) proposed a framework of how eyewitnesses assess their confidence following a lineup identification. The model purports that eyewitnesses engage in a three-step process when assessing confidence: assessment, search, and evaluation. The model can also be used to explain other eyewitness phenomena and may help elucidate why bystanders seem to conform more than actors. Using this model, during the first stage a bystander will assess their internal cues for accuracy (e.g., memory strength). If these internal cues are weak (e.g., low memory strength), bystanders will enter stage two where they will search for external cues. In this case, the misinformation provided by the co-witness (actor) serves as an

external cue. Finally, the bystander will evaluate the external cue before incorporating the incorrect answer in their memory recall. This is where bystanders may be particularly susceptible to information from an actor who is seemingly credible (after all, they were the person whom the confederate spoke to). The Charman et. al. model predicts that credible sources will lead to integration of a cue while non-credible sources will lead to discarding of a cue. In this case, actors may display more credibility and their information seen as a viable correct answer, thereby leading bystanders to agree.

Future studies on memory conformity should perhaps focus on disentangling the effects of normative and informational influences by manipulating conditions for each in individual studies. The current studies are a stepping-stone for gathering more information about memory conformity for actors and bystanders. The results show that bystanders are more likely to agree with a co-witness who had a more prominent role in an interaction. However, it is difficult to discern if normative influences or informational influences are at play or if a combination of both is creating the effects. Thus, future research should focus on understanding the underlying mechanisms associated in these situations. Using that information researchers will be better able to inform authorities about the effects a person's role plays in later memory recall.

Table 1

The frequencies of the person responding first with the person responding second (Study 1).

		Person responding first identified:							Total
		1	2	3	4	5	6	Not there	
Person responding second identified	1	<b>0</b>	2	1	3	3	1	0	10
	2	2	<b>22</b>	6	11	7	7	5	60
	3	0	2	<b>8</b>	7	1	5	2	25
	4	1	2	6	<b>15</b>	5	1	5	35
	5	0	5	2	8	<b>5</b>	2	1	23
	6	1	3	0	5	2	<b>6</b>	0	17
	Not there	0	0	1	0	1	0	<b>4</b>	6
Total	4	36	24	49	24	22	17	176	

Table 2

Whether the second person conformed or not depending on if they were the bystander or the actor (Study 1).

	The Second Responder	
	Did not conform	Did conform
Actor (interacted)	70 (75.3%)	23 (24.7%)
Bystander	46 (55.4%)	37 (44.6%)
Column total	116 (65.9%)	60 (34.1%)

Table 3

Agreement for actors and bystanders for interaction questions 2 and 4 (Study 2).

Statistical differences marked with an asterisk.

	<u>Q2*</u>		<u>Q4*</u>		<u>Q5</u>		<u>Q6</u>	
	Act	Bys	Act	Bys	Act	Bys	Act	Bys
Agree	22%	35%	6%	19%	42%	35%	12%	14%

Table 4

Lineup Agreement for actors and bystanders (Study 2).

Confederate ID	<u>Target Present</u>		<u>Target Absent</u>	
	Actor	Bystander	Actor	Bystander
Wrong	11%	22%	26%	31%
Right	71%	89%	50%	48%
	41%	56%	38%	40%

Figure 1

Confederate and target-absent lineup (Study 1).

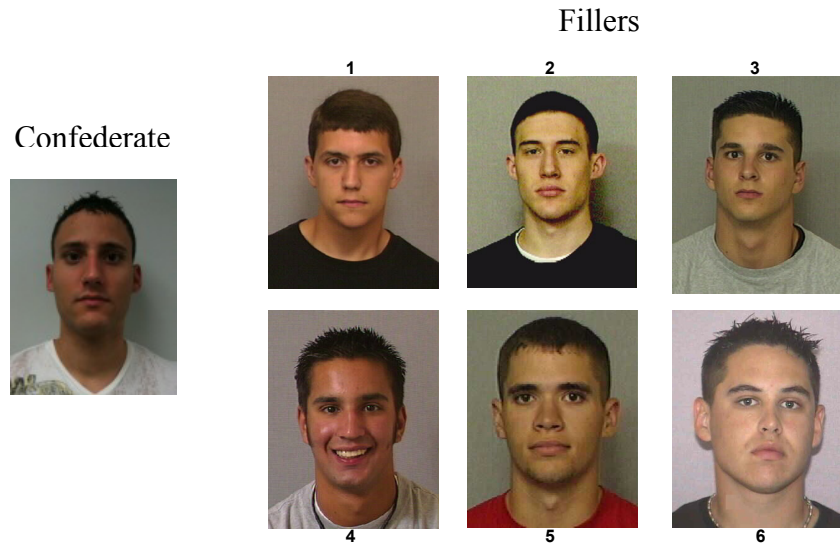
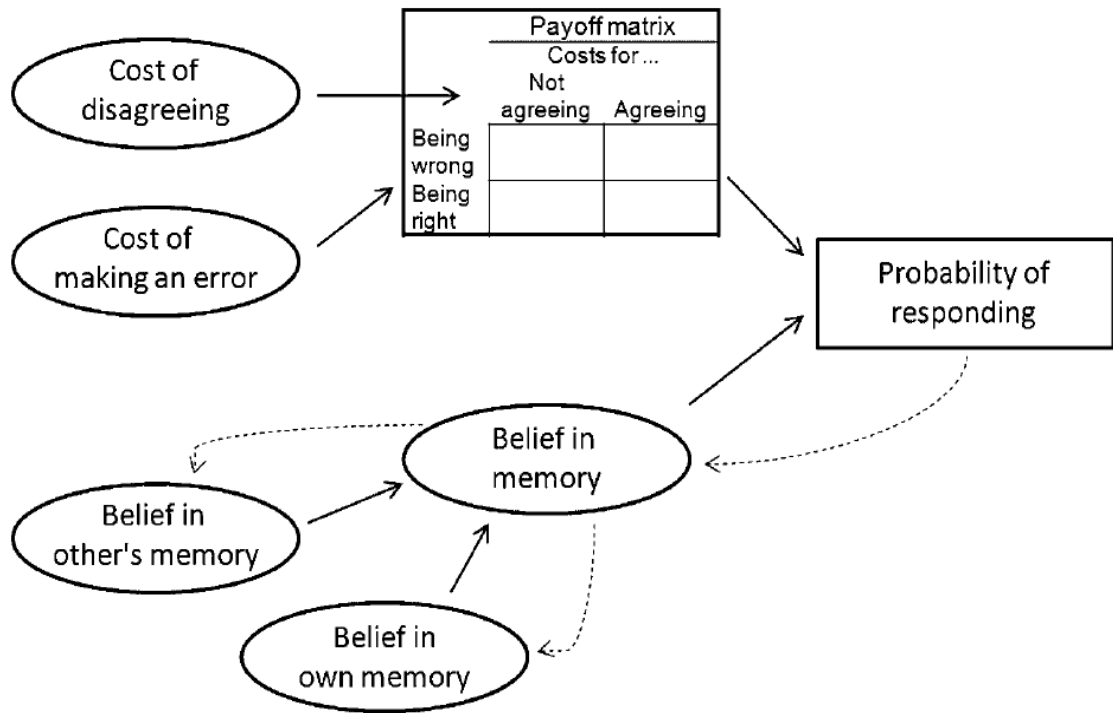


Figure 2

Model of how normative and informational influences affect memory conformity from Wright, London & Waechter, 2010.



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## APPENDICES

### Appendix A

#### Informed Consent Study 1

Dan Wright, senior professor at Florida International University, is conducting the present study. Marianna Carlucci, a graduate student in the Psychology Department at FIU, is aiding in the research. The title of the study is “Memory for People.” You are about to participate in a study about how people remember others. We ask that you read this form and if you have any questions please contact us before agreeing to participate in this study. We expect your participation will take about 10 minutes of your time.

If you agree to be a part of this study you will be asked to answer a series of questions about your memory. You may discontinue your participation at any time if you are not comfortable answering the questions asked during the study.

Any information obtained during this study that could identify you will be kept strictly confidential. The information gained from this study may be published in scientific journals or presented at scientific meetings, but your identity will be kept strictly confidential. All research records will be kept in a secure location; only the researchers will have access to the records.

Your decision to participate is voluntary and will not affect your future relations with Florida International University. If you decided to participate, you are free to discontinue participation at any time.

There are benefits in participating in this study. You will learn about the research process and gain a better understanding of how psychological research can be applied to the legal system. Risks associated with this research, if any, are minimal. You may feel uncomfortable providing personal information, however your responses are all confidential, and you are welcome to discontinue your participation if you are uncomfortable. Some of the questions ask about your gender, your ethnicity, and your age. Please feel free to leave any of those items unanswered if you feel that the answers may reveal your identity.

The primary researchers conducting this study are Dr. Dan Wright and Marianna Carlucci. You may ask any questions you have now or later by emailing Dan Wright at [Daniel.Wright@fiu.edu](mailto:Daniel.Wright@fiu.edu) or calling 305-348-1827. If you would like to talk with someone about your rights of being a subject in this study you may contact Dr. Patricia Price, the Chairperson of the FIU Institutional Review Board at 305-348-2618 or 305-348-2494.

**I read and understood the information presented above. All of my questions have been answered to my satisfaction. I consent to take part in the study.**

Print Name: \_\_\_\_\_

Signature: \_\_\_\_\_

## Appendix B

### Informed Consent Study 2

Marianna Carlucci, a graduate student in the Psychology Department at Florida International University, is conducting the present research study. Daniel Wright, a professor in the Psychology Department at FIU, is supervising the research. The title of the study is “Information Gathering”. During your time in this study, you will fill out questionnaires about how you gather information. You will then complete some questions about the study content as well as demographic questions. This study should take about an hour of your time.

The results of this study may be published, but neither your name nor identity will be revealed and all of the data and information collected from you will remain anonymous. All data will be identified with numbers that have no links to you as a research participant, and will be kept in a secure place. Nonetheless, some of the questions on the demographic sheet ask about, among other things, your gender, your ethnicity, and your age. Please feel free to leave any of those items unanswered if you feel that the answers may reveal your identity.

Participation in this study may benefit you by allowing you to become better informed about the research process. This study may benefit society by contributing to the understanding of how people gather information. **You will receive 1 credit** for participating in the present study.

There are minimal risks and discomforts associated with this research, but feel free to leave any question blank if you would rather not answer.

Your participation is voluntary. If any aspect of this experiment makes you uncomfortable, remember that you are free to abort the study at any time. You are free to decide not to participate in this study or to withdraw at any time without adversely affecting your relationship with the investigators or Florida International University. Your refusal to participate will involve no penalty to you or loss of any benefits to which you are otherwise entitled. Furthermore, withdrawal from this study will not harm your relationship with the psychology department at FIU. Check with your instructor for alternatives to participation.

For questions or concerns about this study you may contact Marianna Carlucci at 305-348-6175 or [Mcarl003@fiu.edu](mailto:Mcarl003@fiu.edu). You may also contact Daniel Wright at (305) 348-1827 or [dwright@fiu.edu](mailto:dwright@fiu.edu). If you feel that you were mistreated or would like to talk with someone about your rights as a volunteer in this research study you may contact Dr. Patricia Price, the Chairperson of the FIU Institutional Review Board at 305-348-2618 or 305-348-2494.

**I have read and understood the information presented above. The researchers have answered all the questions I had to my satisfaction. I consent to take part in the “Information Gathering” study.**

**Print Name:** \_\_\_\_\_

**Signature:** \_\_\_\_\_

Appendix C

Demographics Questionnaire

1. What is your age? \_\_\_\_\_ Years
2. What is your gender? Check one: \_\_\_\_\_ Male \_\_\_\_\_ Female
3. Which of the following categories best reflects your ethnic/racial identity? (check only one)  
  
\_\_\_\_\_ African American                      \_\_\_\_\_ Asian/Pacific Island  
\_\_\_\_\_ Caucasian: Non-Hispanic              \_\_\_\_\_ Hispanic  
\_\_\_\_\_ Native American                      \_\_\_\_\_ Other \_\_\_\_\_
4. What is the highest education level you have completed?  
  
\_\_\_\_\_ high school graduate                      \_\_\_\_\_ junior year in college  
\_\_\_\_\_ freshman year in college                      \_\_\_\_\_ senior year in college  
  
\_\_\_\_\_ sophomore year in college                      \_\_\_\_\_ graduate school or other \_\_\_\_\_
7. What is your current work status? Check one:  
  
\_\_\_\_\_ Employed full time    \_\_\_\_\_ Employed part time    \_\_\_\_\_ Unemployed
8. What is your occupation? \_\_\_\_\_
9. What is your current marital status? Check one:  
  
\_\_\_\_\_ Single              \_\_\_\_\_ Married              \_\_\_\_\_ Divorced              \_\_\_\_\_ Widowed
10. What is your political affiliation?  
  
\_\_\_\_\_ Democrat                      \_\_\_\_\_ Republican                      \_\_\_\_\_ No affiliation  
  
\_\_\_\_\_ Other
11. What languages do you speak? \_\_\_\_\_

## Appendix D

### Confederate 2 Script

(Confederate 2 enters room) “Do you know where the Research Assistant is?” ... “Oh, I participated an hour ago and she sent me an email to come back in 30 minutes because I forgot to sign the consent form and she can’t give me credit for my abnormal psych class with Professor Perez unless I sign it. Hmm...I guess I can come back after my Sociology class gets out in an hour. Damn, but I have another study in DM 142 at the same time. Okay, I’ll e-mail her, don’t worry.”

## Appendix E

### Video Memory Questionnaire

1. The documentary describes American society in what year? (2057)

Participant 1: \_\_\_\_\_

Participant 2: \_\_\_\_\_

2. What does the grandfather throw in his suitcase? (Cowboy hat; a pair of pants)

Participant 1: \_\_\_\_\_

Participant 2: \_\_\_\_\_

3. What is the name of the boy in the documentary? (Paul)

Participant 1: \_\_\_\_\_

Participant 2: \_\_\_\_\_

4. The German scientist configured two cameras to follow his eyes. What green shapes surround his eyes on the computer? (Squares; Circles)

Participant 1: \_\_\_\_\_

Participant 2: \_\_\_\_\_

5. Where does the boy's mother work? (Police headquarters, Lawyer)

Participant 1: \_\_\_\_\_

Participant 2: \_\_\_\_\_

6. When the boy tries to hack into the system, what words are displayed on his computer? (Access denied; Wrong password)

Participant 1: \_\_\_\_\_

Participant 2: \_\_\_\_\_



## Appendix F

### Interruption Memory Questionnaire

Research Assistant: “Now I’d like to ask you some questions about your time in the laboratory. A girl came looking for me, is that correct? She is actually working for the study and I’d like to ask you some questions about her time here.”

1. How long ago did she say she participated? (An hour ago)

Participant 1: \_\_\_\_\_

Participant 2: \_\_\_\_\_

2. What class did she say her credit would be applied to? (abnormal psych, intro to psych)

Participant 1: \_\_\_\_\_

Participant 2: \_\_\_\_\_

3. How did she say I contacted her? (Through e-mail)

Participant 1: \_\_\_\_\_

Participant 2: \_\_\_\_\_

4. What professor did she say she was taking the class with? (Perez, Gomez)

Participant 1: \_\_\_\_\_

Participant 2: \_\_\_\_\_

5. What class was she headed to? (Sociology, Anthropology)

Participant 1: \_\_\_\_\_

Participant 2: \_\_\_\_\_

6. What room did she say the other study was in? (DM 142, DM 180)

Participant 1: \_\_\_\_\_

Participant 2: \_\_\_\_\_

Research Assistant: “Okay, now I’d like each of you to pick her out of this lineup. What number is she? How confident are you in your decision?”

Participant 1: \_\_\_\_\_  
Participant 2: \_\_\_\_\_

## Appendix G

### Cost of Disagreeing Questionnaire

Please circle the response that best represents your level of agreement with each statement.

1. It is more important to be right than it is to be liked.

1 Strongly disagree	2 Disagree	3 Slightly disagree	4 Neutral	5 Slightly agree	6 Agree	7 Strongly agree
------------------------	---------------	------------------------	--------------	---------------------	------------	---------------------

2. To avoid a possible conflict, I would rather agree with others even when I know that they are wrong.

1 Strongly disagree	2 Disagree	3 Slightly disagree	4 Neutral	5 Slightly agree	6 Agree	7 Strongly agree
------------------------	---------------	------------------------	--------------	---------------------	------------	---------------------

3. Sometimes I feel obligated to agree with others even when I know that they are wrong.

1 Strongly disagree	2 Disagree	3 Slightly disagree	4 Neutral	5 Slightly agree	6 Agree	7 Strongly agree
------------------------	---------------	------------------------	--------------	---------------------	------------	---------------------

4. It makes me feel uncomfortable to disagree with someone even when I know that I am right.

1 Strongly disagree	2 Disagree	3 Slightly disagree	4 Neutral	5 Slightly agree	6 Agree	7 Strongly agree
------------------------	---------------	------------------------	--------------	---------------------	------------	---------------------

5. When I know the correct answer to a question, I always speak up even if it requires telling someone else that they have answered incorrectly.

1 Strongly disagree	2 Disagree	3 Slightly disagree	4 Neutral	5 Slightly agree	6 Agree	7 Strongly agree
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Appendix H

Suspicion Questionnaire

1. What do you think this study is about?

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2. Do you feel like you were deceived or were you suspicious about anything during your time in this study?

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## Appendix I

### Debriefing

Thank you for your participation. I would now like to tell you a bit more about the study that you just participated in. Much research has investigated how what one person says influences what other people say. This is called memory conformity. In this study we were interested in knowing how the role someone plays in an interaction affects their susceptibility to memory conformity. That is, would memory conformity be higher depending on whether the participant was the actor or bystander in an interaction. This study will help researchers form a theoretical model for why memory conformity occurs and under what conditions it is more likely to occur. The person you interacted with and the person you thought was another participant were actually confederates (working with the researcher of this study) who were asked to answer a certain way. I hope you enjoyed partaking in the study and hope you will not tell other people about this study. It is very important that the people who participate in the study not know what the study is really about. This will ensure that our results are based on the stimulus material used and not expectations about what the study is about. Thus, it would be very helpful to us if you did not discuss the study with anyone you know as they might participate in the study in the future. At this time I would like to answer any questions you might have about the study you just participated in.

## VITA

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