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# Effects of postidentification feedback misinformation on eyewitness memory for the culprit

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**Effects of postidentification feedback misinformation on
eyewitness memory for the culprit**


by


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**TABLE OF CONTENTS**

ABSTRACT

This research extended the traditional conceptualization of the postidentification feedback effect beyond retrospective self-reports to include the effects of feedback on eyewitnesses' recognition memory for the originally-witnessed culprit. Participant-witnesses made inaccurate identifications and were given confirming, disconfirming, or no feedback. Forty-eight hours later, witnesses were tested on their recognition memory for the culprit originally viewed. Disconfirming feedback inhibited witnesses' ability to discriminate between the culprit and never-before-seen filler photos. Witnesses who did not receive feedback showed the highest memory performance overall. These results provide preliminary support for the idea that postidentification feedback negatively affects eyewitness recognition memory.

CHAPTER 1.  GENERAL INTRODUCTION

One night in July of 1984, 22-year-old Jennifer Thompson was asleep in her bed when a man broke into her apartment, held a knife to her throat, and raped her. Determined to identify the assailant if she survived the attack, Jennifer deliberately studied the man's face throughout the thirty minutes he was in her apartment.  Three days after the rape, Jennifer viewed a photo lineup at the police station and identified Ronald Cotton as her attacker. After announcing her identification, the detective remarked "We thought this might be the one."  One week later, Jennifer again identified Ronald Cotton—this time from a live lineup—and was told, "That's the one you picked out in the photo."  She testified against Cotton in two separate trials.  Both times, the jury found Cotton guilty of rape and burglary and sentenced him to life plus fifty four years in prison.  After Cotton had served ten and a half years of his sentence, DNA testing exonerated Cotton and conclusively proved that a man named Bobby Poole was the rapist.

This story is only one of many miscarriages of justice that resulted at least in part from mistaken eyewitness identifications.  Eyewitness misidentifications are the leading cause of wrongful convictions, accounting for 75% of DNA exoneration cases in the United States (www.innocenceproject.org).  Those who study eyewitness identification have long been aware of the fragile nature of eyewitness memory, but the extraordinary circumstances surrounding Jennifer's story make this case particularly shocking. Jennifer had the opportunity to identify Bobby Poole—the actual attacker—during Ronald Cotton's second trial.  Cotton's lawyer had subpoenaed Poole, who was in prison for similar assaults, after inmates heard Poole bragging about getting away with raping

Jennifer and another woman on the same night. Yet when Jennifer viewed Poole in the courtroom, she denied ever having seen him and reasserted her certainty that Cotton was the assailant. In an interview with Jennifer after Cotton's exoneration, Jennifer was asked who she sees when she thinks of the rapist. She answered:

"I still see Ronald Cotton. And I am not saying that to point a finger. I am just saying that is who I see. And I would love to erase that face out of my mind. I would do anything to erase that face out of my mind, but I can't. It is just in my head. Sometimes it is more fuzzy than others because my mind now says 'Well, it's Bobby Poole,' but it is still the face I see." – PBS frontline

What happened to Jennifer's memory of Bobby Poole, the man whose face she carefully and methodically studied throughout the duration of the attack? Why did she fail to recognize him when he stood before her in the courtroom? Intuition might suggest that Jennifer's memory of Bobby Poole somehow became obscured, lost, or replaced by the face of Ronald Cotton. If Jennifer had seen Poole's picture in the first photo lineup, surely she would have recognized him. But would she have recognized him after she already picked Cotton from the photo lineup and was given reinforcing feedback by the detective ("We thought this might be the one")? What about after she chose Cotton in the live lineup and learned that she picked the same man as the photos?

A long line of psychological research has established that human memory is malleable (Loftus, 2005). Studies examining the effects of misleading post-event information on memory, source monitoring errors, and rich false memories all support the idea that recollections of the past are subject to distortion arising from a host of sources. Over thirty years of research on eyewitness memory in particular has led to an increased

understanding of the different factors that affect eyewitnesses' recollections of criminal events.  Perhaps one of the most significant findings that emerged from that body of work is that witnesses' memory can be influenced substantially by post-event suggestion provided to them after they have made an identification.  For example, telling witnesses whether or not the person they identified is the suspect of the police investigation has been found to affect witnesses' subsequent memory reports in dramatic ways. Confirming feedback like the kind Jennifer received ("We thought this might be the one.") inflates witnesses' reports of how certain they recall having been at the time of the identification and distorts their recollections of the witnessing experience, leading witnesses to report having experienced more favorable witnessing conditions (i.e., that they paid more attention during the crime, had a better view of the culprit, etc.).  This is called the postidentification feedback effect (Wells & Bradfield, 1998).

In the original postidentification feedback effect studies (Wells & Bradfield, 1998), witnesses to simulated crimes made identification attempts from lineups and were then randomly assigned to receive confirming feedback (e.g., "Good, you identified the suspect") or no feedback.  All witnesses who made identifications were mistaken because they were given a culprit-absent lineup. Witnesses were later asked a number of testimony-relevant questions regarding their certainty ("At the time of your identification, how certain were you that you identified the actual culprit?"), view ("How good was the view you had of the culprit?" "How well could you make out details of the culprit's face?"), and attention ("How much attention did you pay to the culprit's face?"). Results of these original studies and many subsequent studies show that confirming feedback strongly inflates witnesses' estimates of how certain they recall having been at the time of

the identification, how good their view was, how well they could make out details of the culprit's face, and how closely they attended to the culprit during the crime (Bradfield, Wells, & Olson, 2002; Dixon & Memon, 2005; Wells & Bradfield, 1999; Wells, Olson, & Charman, 2003). Whereas past research has repeatedly demonstrated robust distorting effects of feedback on self-report measures like identification certainty and witnesses' recollections of the witnessing experience, to date little research has addressed the effects of postidentification feedback on another critical component of eyewitness memory: memory of the culprit. The present research aimed to expand upon our understanding of how postidentification feedback affects eyewitness memory by testing whether postidentification feedback about an inaccurate identification influences witnesses' ability to later recognize the culprit.

There is reason to believe that in addition to distorting witnesses' subjective recollections of their certainty, view, and attention, postidentification feedback may also impair objective memory of the witnessed event. Multiple studies have shown that other forms of social influence can distort memory for past events. For example, social influence led people to report having seen an accomplice in a series of pictures when there was none (Wright, Self, & Justice, 2000). Reinforcement from questioners has caused children to make false claims about a past event (Garven, Wood, Malpass, & Shaw, 1998). Innocent people have even falsely confessed to crimes because coercive and suggestive interrogation tactics led them to believe they actually committed the crime (Kassin, 1997). Although it is well-established that postidentification feedback distorts witnesses' retrospective reports of certainty and subjective recollections of the witnessing

experience, the extent to which feedback shares the propensity to alter memory for objective details of a past event is still unclear.

A long-standing line of work in the field of cognitive psychology, which has examined closely the influence of post-event information on memory for objective details of a past event, is of particular relevance to the present research question. The focus of this work has been on the detrimental effects of misleading post-event information, or misinformation, on memory. The traditional misinformation research paradigm consists of three stages. In the classic experiments utilizing the paradigm (e.g. Loftus, 1979; Loftus, Miller, & Burns, 1978), participants first saw a simulated traffic accident. Everyone then received either consistent or misleading information about some details of the event through a post-event narrative or post-event questioning. For example, a stop sign was referred to as a yield sign. Finally, participants were asked whether they saw a stop sign or a yield sign. These studies consistently found that participants who were exposed to the misinformation were more likely to report having seen the yield sign than were those not exposed to misinformation. This bias in memory resulting from exposure to misleading post-event information has been termed the "misinformation effect". Loftus and her colleagues suggested that exposure to misinformation impairs memory for the original event detail because the suggested information either alters or overwrites the original memory trace.

Following these pioneering misinformation studies, a lively debate emerged between the camp of individuals who supported the interpretation that misinformation impairs memory for the original event (e.g., Tversky & Tuchin, 1989; Belli, 1989) and those who contended that the original memory trace is not affected by misinformation

(e.g., McCloskey and Zaragoza, 1985). For decades now, researchers have grappled with the question of whether information, once stored in long-term memory, can ever be lost. Some people take the position that stored information is permanent and that all "forgetting" is simply a result of retrieval failure. But the question of information loss versus retrieval failure can never be resolved in an absolute sense (Loftus & Loftus, 1980). It is impossible to test whether a memory detriment is due to genuine loss or impairment, or whether the information is still buried in memory just unable to be retrieved. Fortunately, the present research does not require that we know the answer to this age-old question because the main variable of interest is a behavior-performance variable. Hence, the focus of the current experiment is on the applied effects of misinformation, namely the extent to which feedback misinformation affects witnesses' ability to recognize the culprit. The question of whether a decrease in memory performance is due to the memory of the culprit being altered, lost, or simply made inaccessible to retrieval is not a principal concern of this research. If witnesses who receive postidentification feedback demonstrate impaired performance during the final test, a memory detriment will be assumed to have occurred. For the purposes of this work, "memory detriment" does not assume the occurrence of a particular underlying process; only that memory test performance has been impaired.

What is of particular importance to the present research is the fact that through the course of this debate, a new paradigm for testing misinformation effects was born. Researchers who opposed the view that misinformation impairs the original memory trace were particularly concerned with the type of test used in the original misinformation studies. Specifically, in the original tests of the misinformation effect (Loftus, 1979;

Loftus, Miller, & Burns, 1978), participants were forced to make a choice between having seen either the misled item or the original item. McCloskey and Zaragoza (1985) argued that participants who chose the misled item on the final memory test may have remembered the original item but chose to select the misled item because of demand characteristics. Or perhaps they chose the misled item not because their memory for the original item was impaired but because they never encoded the original item to begin with. In an attempt to deal with these issues, McCloskey and Zaragoza created a new test—the modified test—which they suggested was better suited to assess the impact of misinformation on the original memory. For purposes of specificity, this modified testing format will be referred to as the "misinformation-absent test". Rather than presenting the misled detail as an option on the final test, the misinformation-absent test required participants to choose between the original event detail and a new, never before seen item. The authors argued that if misinformation actually *impairs* memory for the original detail, then participants who received misinformation should be less likely than control participants to correctly identify the item originally seen. Hence, the misinformation-absent test was proposed as a "cleaner" test of misinformation effects on memory. Although the misinformation-absent test has been found to be a less sensitive test of misinformation effects, the present research utilized an adapted version of this paradigm for reasons that will be explained in depth later.

The present research draws a link between the postidentification feedback effect and the misinformation effect because both of these phenomena involve situations in which a social influence variable affects recollections of the past. But there is a critical distinction between these two lines of work. Research on postidentification feedback has

tended to focus on how misinformation in the form of feedback alters witnesses'
*retrospective self-reports* (i.e. certainty at the time of the identification; goodness of view
and attention paid), whereas research on the misinformation effect examines the impact
of misleading post-event information on the ability to recall *original event details* (i.e. the
"who", "what" and "where"). Thus, misinformation effect research is primarily
concerned with objective recollections of concrete information directly related to a
witnessed event. Postidentification feedback studies, on the other hand, examine
memories related to the witness' subjective experience. Because the present research is
concerned with the effects of postidentification feedback on concrete, person-specific
recognition memory, it draws from both areas of study and their respective research
paradigms.

CHAPTER 2.  THE PARADIGM

The present experiment constituted a unique test of the effects of misinformation in the form of postidentification feedback on eyewitness memory for a concrete event detail.  Accordingly, the research paradigm combined aspects of the postidentification feedback paradigm and the misinformation paradigm.  Aside from a few differences, it was conceptually similar to the misinformation-absent test of the misinformation effect.

Participants first viewed a video of a crime and attempted to identify the culprit from a culprit-absent lineup.  Some participants then received misinformation in the form of confirming feedback following their identification, others received disconfirming feedback, and a control group did not receive feedback.  After a 48-hour delay, all participants were given a test of their memory of the culprit in the form of a culprit-present photo lineup that included the culprit plus five new, never-before-seen fillers.

The first (culprit-absent) lineup that was presented to participants after they viewed the video can be conceived of as an initial memory test.  This is similar to the misinformation paradigm, in which misleading information is often provided through a post-event test.  A critical distinction of the current paradigm, however, is that all participants were exposed to some misinformation, namely a photo lineup that did not include a photo of the culprit.  Whereas control groups in traditional misinformation studies are only exposed to consistent event information, control group participants in the present experiment viewed information inconsistent with the original event (the culprit-absent lineup) and made mistaken identifications.  Past research has found that people perform more poorly on final recognition test items when they had earlier responded to versions of those items with exclusively incorrect test alternatives (Schooler et al., 1988).

Schooler and colleagues suggested that the act of committing to an incorrect alternative interferes with ones subsequent ability to recognize the correct alternative. In consideration of these findings, this paradigm was pilot tested in the absence of feedback to establish a reasonable base rate of recognition accuracy.

Although all participants who made an identification from the first lineup committed to an incorrect alternative, the presence or absence of feedback regarding their choice was the critical misinformation manipulation. Whereas participants in the confirming feedback group were told that they identified the actual suspect, control group participants did not know whether or not their selection was correct, and participants who received disconfirming feedback were told that their selection was incorrect.

This paradigm is reminiscent of the misinformation-absent test of the misinformation effect because the misleading item (e.g., the filler photo selected from the culprit-absent lineup) was excluded from the final test. There are two reasons why this misinformation-absent testing format was ideal for the present experiment. First, presenting a photo lineup that includes the culprit and five new filler photos constituted a "clean" test for the participants. Past research has shown that witnesses are more likely to incorrectly identify from a lineup a person whose photo was seen previously (Deffenbacher et al., 2006; Hinz & Pezdek, 2001). Therefore, it was important that the second lineup consisted of all new filler photos. The second reason for using new filler photos in the culprit-present lineup was to avoid contaminating the results with commitment effects due to participants wanting to appear consistent. It is well established that people are motivated by a need to appear consistent with their previous behaviors and commitments (Cialdini & Trost 1998). If the misleading item (i.e., the

photo previously identified from the culprit-absent lineup) had been included in the final memory test, participants may have favored the previously-chosen photo despite recognizing the culprit. Many eyewitness studies have demonstrated a commitment effect of this sort (Deffenbacher, Bornstein, and Penrod, 2006; Dysart, Lindsay, Hammond, & Dupuis, 2001; Memon, Hope, Bartlett, & Bull, 2002). Although it could be argued that Jennifer Thompson's case did not resemble a misinformation-absent test (Bobby Poole was presented to her at Ronald Cotton's second trial), the primary purpose of the current research was to determine whether witnesses' ability to recognize the culprit is influenced by postidentification feedback about the initial identification. Hence, in an effort to disentangle memory effects from commitment effects, the present paradigm utilized a "commitment-free" test of memory performance.

Because this research tested a novel prediction regarding the effects of postidentification feedback on recognition memory, it was important to utilize dependent measures that were sensitive to subtle memory changes. A traditional identification task that uses the dichotomous dependent measure of identification accuracy would not detect, for example, relative differences in perceived similarity of the culprit versus the other lineup members to the participants' memory of the culprit. Therefore, rather than simply asking participants to make an identification from the second lineup, this experiment assessed the extent to which postidentification feedback influenced participants' similarity ratings of the culprit's photo to their memory of the culprit. Participants who receive feedback may rate the culprit as being relatively less similar to their memory of the culprit than participants who do not receive feedback; however, the culprit may still be the person who they rate is most similar of all the lineup members to their memory of

the culprit. A traditional identification procedure would not detect this more subtle effect. Using a similarity measure rather than administering a new identification task also allowed for the examination of feedback effects on memory while participants still believed that the feedback they received was accurate.

Leading mistaken witnesses to believe that their erroneous identifications were in fact accurate (in the case of confirming feedback) creates a situation similar to what witnesses may experience in misinformation studies. Specifically, Loftus (1992) argued that when post-event information contradicts a witness' original memory, the information can become incorporated into memory, supplementing or altering a witness' initial recollection. Post-event information serves as a form of feedback regarding the witness' recollection of an event detail (i.e., "I thought I saw a stop sign but I guess it was a yield sign"). Similarly, whereas witnesses may initially have a strong memory of the culprit's appearance, being informed that their selection of another individual—one who does not match exactly their memory of the culprit—was "correct" may lead witnesses to adjust their recollections of the culprit accordingly (i.e., "I thought he had a big nose, but I guess it actually wasn't big."). Witnesses may consciously or unconsciously make mental adjustments of this sort after receiving confirming feedback about their identification. As a result, these witnesses may retain a weaker memory for the appearance of the culprit. This interpretation would predict an opposite pattern for witnesses who receive disconfirming feedback. After making an inaccurate identification and receiving disconfirming feedback, witnesses may partake in the opposite kinds of rationalizations (i.e., I didn't think his nose was that small) and thereby retain a stronger memory of the original culprit's facial features or general appearance.

Another possibility is that witnesses who receive disconfirming feedback will perform at least as poorly on the recognition memory test for the culprit as witnesses who receive confirming feedback. This is based on what will be termed the memory-interference interpretation. According to this interpretation, postidentification feedback of any kind will cause memory interference that will lead to subsequently poorer performance on the memory test. In the case of confirming feedback, the face of the misidentified person is reinforced as a result of the feedback, thereby causing interference with memory of the face of the original culprit. Working against the memory impairment effect for confirming feedback is the fact that witnesses tend to identify someone who looks like the culprit. It is generally well accepted that witnesses identify the person in the lineup who most closely resembles their memory of the culprit (Wells, 1984). Hence, differences between the identified person and the culprit are not likely to be very large, resulting in only small effects in terms of memory impairment for the original culprit. Witnesses who receive disconfirming feedback, in contrast, have their preferred choice of a lineup member disconfirmed, suggesting to them that the culprit looked different from the person they identified and leading them to consider the idea that it was one of the persons they rejected. Disconfirming that choice should lead them to reconsider their memory and think that the culprit must have been one of the less similar persons who they had rejected. This, in turn, might lead them to recall one of the rejected lineup members who, on average, should be even less similar to the culprit than was the person they identified. This, in turn could lead to a stronger interference effect for the disconfirming feedback than for the confirming feedback.

CHAPTER 3.  LITERATURE REVIEW

Psychologists who study eyewitness identification generally believe that a mistaken identification taints the witness' memory toward the identified person (Wells & Quinlivan, 2009), but few studies have investigated how postidentification feedback may exacerbate this bias.  Two studies that addressed similar research questions will be discussed below, however neither of these studies was designed nor intended to specifically address the hypothesis that postidentification feedback impairs witnesses' memory of the crime culprit.

A study conducted by Dixon and Memon (2005) examined the effects of identification feedback on the quantity and accuracy of crime event details recalled and witnesses' willingness to answer misleading questions.  In their study, witnesses viewed a crime video and made an identification from a culprit-absent lineup.  They then received confirming, disconfirming, or no feedback and were asked questions probing their memory for details regarding the crime and culprit.  The authors did not find a significant effect of feedback on the overall quantity and accuracy of details recalled or willingness to answer misleading questions, although disconfirming feedback significantly reduced eyewitness confidence in recall accuracy.

These findings do not threaten the integrity of the present research for two reasons.  The first reason is that Dixon and Memon (2005) tested the effects of feedback on recall of details, rather than on recognition for the object of the feedback (the culprit).  Because there are a number of variables that affect recall and recognition in different ways, it has been suggested that different processes may underlie these two types of memory performance (Anderson & Bower, 1972).  It is therefore important to examine

independently the effects of feedback on recognition memory. Furthermore, of the 25-item memory questionnaire utilized in their study, only four questions specifically assessed memory for the culprit. An example they gave of this category of questions is "What colour was the robber's hair?" Questions like this one do not serve as an appropriate test of feedback effects on memory for the culprit because the lineup fillers in this study were selected "on the basis of their physical similarity [to the culprit]" and, presumably, all had the same hair color. In order to detect effects of feedback on general description measures, it is necessary that differences between the culprit and the misidentified person exist in the first place, so that details observed during the original event can be distinguished from ones that were gleaned from the photo lineup. Without seeing the materials used by the researchers, one must assume that answers to questions regarding the culprit's general appearance would be correct or incorrect for both the culprit and the filler, thereby limiting these findings.

The second important caveat to their results is that the post-event questionnaire was administered to participants immediately after they received feedback. The lack of a delay between the feedback manipulation and the final memory test may have dampened the effects of feedback on memory of crime details. The current research assumes that a memory detriment resulting from feedback, if present, would manifest itself over time rather than immediately. One line of reasoning that could account for this possibility is if confirming feedback leads witnesses to rely on their memory of the identified person rather than the original culprit. After receiving confirming feedback, witnesses may no longer differentiate between the person who committed the crime and the person they identified from the lineup. Thus, when a witness who was told "You got the guy!" thinks

back to the crime, he or she may substitute the image of the identified person, believing it to be the same person. Confirming feedback may in a sense grant permission to witnesses to consider the criminal and the identified person effectively interchangeable. With repeated retrievals of the identified person's image rather the image of the perpetrator, the witness may gradually lose access to the memory of the originally witnessed perpetrator. This process, however, is likely not instantaneous and would therefore best be tested after a period of delay.

A similar test of the hypothesis that feedback affects witnesses' ability to later identify the culprit can be found in a set of studies investigating the effects of viewing a show-up on accuracy in a subsequent lineup (Lawson &, Dysart, 2010, unpublished). Participants in this experiment viewed a crime video and then viewed a single photograph (show-up) of an individual who either was or was not the culprit. Some participants then received confirming feedback about their show-up decision and others received no feedback. Although the authors did not find significant effects of feedback on accuracy or choosing rates from a subsequent lineup, a few methodological considerations may account for the null findings.

First, culprit presence was manipulated during the initial show-up, such that only half of the participants viewed a culprit-absent show-up. Within the culprit-absent show-up condition, only 19.3% of participants made a false identification, and presumably only half of those (~9.6%) were assigned to the confirming feedback conditions. Thus, only about 4.8% of the entire sample (approximately 15 participants) made an inaccurate identification from the show-up and then received confirming feedback. These numbers do not constitute a legitimate test of the idea that confirming feedback about a prior

inaccurate identification impairs memory for the original culprit person. In addition, the misleading show-up person was always included in the final lineup. As previously discussed, this type of test is better suited for studying commitment effects rather than memory impairment. Finally, like Dixon and Memon's (2005) study, the final memory test shortly followed the feedback manipulation, potentially further limiting these findings.

The present experiment involved two procedural nuances that are regarded as crucial to detecting feedback effects on memory of the culprit. First, the photo of the misidentified person was visible to participants during and shortly after the feedback manipulation. The null findings in the aforementioned studies (Dixon & Memon, 2005; Lawson &, Dysart, 2010, unpublished) may be due at least in part to the fact that participants were likely not able to process the identified person's face after receiving feedback. In the real world, witnesses are typically exposed to the misidentified person on multiple occasions before the trial hearing takes place. Thus, in an attempt to best recreate what may be an important precondition of this phenomenon, participants were able to continue viewing the identified person during and shortly after the receipt of feedback.

Based on the assumption that feedback exerts its influence on memory over time rather than immediately, the second procedural consideration was to introduce a period of delay between the first identification procedure and the final memory test. In addition, rarely (if ever) would a real eyewitness receive confirming feedback about an identification and then be asked immediately to perform a new photo lineup procedure for the same person. More likely is that after new facts have surfaced (i.e. the identified

suspect provides an iron-clad alibi or is otherwise proven to be innocent), the witness may then be asked to perform a new identification. In Jennifer Thompson's case, she viewed Bobby Poole for the first time more than three years after the crime occurred—after she had already identified Ronald Cotton from a photo lineup, a live lineup, and in court. In her interview, Jennifer recollected, "When I would have a nightmare, when I would re-live the night in my head, Ronald Cotton's head, his face was right there for me to see for years."

CHAPTER 4.  MATERIALS AND METHODS

*Participants and Design*

A total of 125 participants were recruited through the on-line SONA system in the Psychology Department at Iowa State University.

The study used a between-participants design with three levels of the independent variable: confirming, disconfirming, or no feedback.  It was conducted in two sessions, 48 hours apart.

*Materials*

The stimulus video viewed by participants depicted an airport scene in which a suspicious individual switched his luggage bag with another passenger's bag at the check-in line (Appendix A). After switching the bag, the culprit exited the airport. The video lasted one minute-twenty eight seconds and showed multiple views of the culprit's face.

The first lineup viewed by participants was a six-person culprit-absent photo lineup in which all six lineup members fit the general description of the culprit, but none of whom was the actual culprit (Appendix B).  After making an identification, participants answered a series of questions (Appendix C) intended to assess certainty in their identification and other testimony-relevant judgments.  The questionnaire, adapted from Wells and Bradfield (1998), has been used in a large share of the research on eyewitness identification and was based in part on the U.S. Supreme Court's criteria for identifying a reliable witness (*Neil v. Biggers*, 1972; *Manson v. Braithwaite*, 1977).

The final memory test was in the form of a six-person culprit-present photo lineup, which consisted of a photo of the actual culprit and five new filler photos of

individuals who matched the general description of the culprit (Appendix D).  The

culprit's photo was rotated throughout all six positions in six different versions of the

lineup to which participants were randomly assigned.  Response latencies were collected

for all measures.

***Procedure***

The experiment took part during two sessions, 48 hours apart.  Both sessions were

conducted on a lab computer, and all of the dependent measures were collected in

MediaLab in order to minimize experimenter expectancy effects.

*Session 1: Video and Feedback Misinformation*

Upon entering the lab, participants were instructed to read the informed consent

document and sign it if they agreed to participate.  Participants were told that the study

involved "perceptions of people" and that they would watch a short video and answer

questions.  They were instructed to watch the video carefully and to pay attention to any

suspicious activity.

After watching the video, participants were told that the actual purpose of the

study was for them to identify from a lineup the person who switched bags.  All

participants were then shown the six-person culprit-absent lineup.  In line with

procedures from the original postidentification feedback study (Wells & Bradfield, 1998),

participants were given biased lineup instructions, meaning that they were not informed

that the culprit "may or may not be present" nor were they given the option to select "Not

There". Previous experiments utilizing this procedure have found that nearly 100% of the

participants make an identification.

Following their identification decision, participants were randomly assigned to receive either confirming feedback ("Good!  You identified the actual suspect"), disconfirming feedback ("Actually, that's incorrect. That wasn't the suspect") or no feedback.  The feedback was administered both on the computer screen and by the experimenter.  The feedback administered on the computer was presented concurrently with the image of the identified person.

Finally, participants answered a series of questions (Appendix C) to assess certainty in the identification and other testimony-relevant judgments.  They were instructed to return 48 hours later in order to answer additional questions about what they witnessed and whom they identified.  Before leaving, the experimenter told participants:

"Try to imagine that you are a real eyewitness to a crime.  You will be coming back to answer more questions in two days, similar to what a real eyewitness might have to do.  So it is important for you to try not to forget about what you witnessed today.  Just like a real eyewitness to a crime, you may want to think about what you witnessed so that you can provide accurate information when you come back."

*Email reminder*

Immediately following the first session, a member of the research team e-mailed the participant ostensibly to remind him/her of the upcoming session.  The true purpose of the reminder email was to induce the participant to reflect upon what occurred during the first session.  In doing so, the email served as an attempt to replicate the experience of a real eyewitness, who would likely ruminate over the crime event and the identification experience.

The e-mail specifically reminded the participant of the time and date of the upcoming session.  The participant was informed that among other tasks, he or she would be asked to provide a written description of the culprit and should therefore make an effort to retain a memory of the person who was viewed in the video.  The e-mail reminded participants that they would be asked additional questions about what they witnessed and whom they identified.  Instructions similar to these are customarily given to real eyewitnesses to crimes.  For example, a police officer may tell a witness to expect to speak with a prosecuting attorney or the defense attorney about the identification and the witnessed event.

*Session 2: Memory test*

When participants returned to the lab 48-hours after the first session, they were prompted to provide a detailed written description of the culprit.  The purpose of obtaining this description was to reinstate the context of their prior visit.

Participants were then presented with the culprit-present lineup (Appendix D) and were asked to rate on a scale from 0%-100% the similarity of each lineup member to their memory of the culprit.  After collecting the similarity ratings, which constituted the main dependent measure, participants were also asked to rank the photos from who is most to least similar to their memory of the culprit and to indicate whether they think any of the people in the lineup was the person from the video (Yes/No). If they answered "yes", they were asked to indicate who.  If they answer "no", they were asked, "If you had to choose someone who looks most like your memory of the person who switched the bags, whom would you choose?"

Participants then answered the same dependent measure questions to assess their original witnessing experience (Appendix C). Last, they completed a manipulation check in which they were asked to identify their feedback condition and they answered a question about whether they received and read the reminder e-mail. Following their participation, participants were debriefed and given an opportunity to ask questions.

CHAPTER 5.  RESULTS

*Attrition*

A total of eight participants did not return for the second session—two from the confirming feedback condition, one from the disconfirming feedback condition, and five from the control condition.  Because complete data did not exist for these participants, they were excluded from further analyses.

*Receipt of e-mail and Manipulation Check*

At the end of the second session, all participants were asked whether they received and read the reminder e-mail that was sent to them after their first session. Ninety-eight of the 117 remaining participants (83.3%) reported having received and read the e-mail. These rates did not differ as a function of feedback condition.  As a manipulation check, participants were asked to identify the kind of feedback (if any) that they received after their first-session identification.  Only three of the participants were unable to accurately report on their feedback condition—two in the confirming feedback condition and one in the disconfirming feedback condition.  These participants were excluded from the analyses, leaving a total of 114 participants for the remaining analyses.

*Primary Measures*

*Similarity ratings*

On the whole, participants rated the percent similarity of the culprit to their memory of the culprit as quite high ($M = 80.12$) relative to the filler photo with the highest average rating (Number 5, $M = 47.39$).  This finding suggests that participants retained a relatively strong memory of the culprit.  The average of all the filler similarity ratings was 22.59.  A one-way between-subjects ANOVA was conducted to assess the

main effect of postidentification feedback on participants' similarity ratings of the culprit, the average similarity ratings of the fillers, and the difference between the culprit and the average filler ratings (Table 1). There were no significant differences between feedback conditions for participants' perceptions of the similarity of the culprit to their memory of the culprit, $F(2, 111) = 1.33$, $p = .27$, nor was there a significant difference in the average similarity rating for the filler photos, $F(2, 111) = 1.58$, $p = .21$. There was, however, a marginally significant effect of feedback on the difference ratings, which measured "discriminatory recognition", or the extent to which participants judged the culprit to be similar to their memory of the culprit over and above the fillers, $F(2, 111) = 2.57$, $p = .08$. Discriminatory recognition was computed by subtracting the average filler similarity rating from the culprit similarity rating. The disconfirming feedback group exhibited the lowest discriminatory recognition, ($M = 49.88$) compared to the confirming feedback group ($M = 58.12$) and the control group ($M = 65.65$). Follow up Games-Howell simple effects tests indicated that relative to the control group, participants who received disconfirming feedback were less able to accurately discriminate between the culprit and the fillers, $Mdiff = 15.77$, $p = .06$, $d = .53$, 95% CI [-.46, 32.00]. In other words, the ability for participants to detect differential similarity of the culprit relative to the filler photos was reduced for participants who received disconfirming feedback. There were no significant differences between the confirming feedback and control groups; however, the pattern of differences was in the predicted direction.

**Table 1 - Mean Similarity Ratings (0% - 100%)**

| Condition | Culprit | Filler Average | Culprit-Filler Ave (Difference) |
|---|---|---|---|
| Confirming | 81.49 | 23.36 | 58.12 |
| Disconfirming | 75.12 | 25.24 | 49.88 |
| Control | 84.42 | 18.77 | 65.65 |
| **Total Average** | **80.12** | **22.59** | **57.88** |

*Identification accuracy*

After rating and ranking the photos, participants were asked whether they believed that the culprit was in the photo lineup. If they answered affirmatively, they were asked to indicate who; if they answered negatively, they were prompted to provide a "best guess" of the identity of the culprit. The responses of participants who chose voluntarily and those who chose when forced were combined to create a measure of identification accuracy. Identification accuracy was analyzed using a Pearson Chi-square Goodness-of-fit test, which did not reach statistical significance, $\chi^2 = 3.98$, $p = .14$. However, the group patterns of identification accuracy reflected the trend of the culprit rank scores, such that participants who received disconfirming feedback tended to be less accurate (70.73% accuracy) in identifying the culprit from the group of photos than were participants in the confirming feedback (81.08% accuracy) and control (88.89% accuracy) groups. These trends were not a result of differential choosing rates; the three groups did not differ in the belief that the culprit was among the set of photos. In other words, the proportion of participants who chose voluntarily and those who were forced to choose did not differ systematically as a function of feedback condition.

An examination of the accuracy rates of participants who chose voluntarily versus choosing only when forced indicates that the disparate accuracy rates were driven primarily by participants who chose only when forced to do so. Whereas the accuracy rates for participants who chose voluntarily were within five percentage points of one another (Table 2), the accuracy rates for participants who were forced to choose varied greatly: 85.71% of participants in the control group were accurate versus 70.00% in the confirming feedback group and 36.36% in the disconfirming feedback group. In exhibiting caution due to small cell sizes (7, 10, and 11, respectively), statistical tests were not conducted for the "forced choice" subset of participants.

**Table 2 - Identification Accuracy**

|  | Confirming | Disconfirming | Control |
| --- | --- | --- | --- |
| Voluntary Choosers | 85.19% | 83.33% | 89.66% |
| Forced Choosers | 70.00% | 36.36% | 85.71% |
| **Combined** | **81.08%** | **70.73%** | **88.89%** |

*Response Latencies*

An examination of response latencies from the Time 2 memory test measures indicated a marginally significant effect of feedback condition on the time it took participants to render a similarity rating for the culprit's photo, $F(2, 111) = 2.91$, $p = .06$. Participants in the control condition took more time to render a similarity rating for the culprit ($M = 14928$ ms) than did participants in the confirming ($M = 11243$ ms) and disconfirming feedback conditions ($M = 10247$ ms). Results of follow-up Games-Howell simple effects tests suggested that participants in the control condition took significantly

longer than did participants in the disconfirming feedback condition to render a similarity judgment (*Mdiff* = 4680 ms, *p* = .07, *d* = .54, 95% CI [227 ms, 9589 ms]).  There was not a reliable effect of feedback on response latency times to rate the similarity of the filler photos or to complete the ranking or choosing tasks.

*Self-report measures*

The next set of analyses examined participants' answers to the traditional postidentification feedback effect self-report measures both from Time 1 and from Time 2.  In line with past research, there was a main effect of postidentification feedback on participants' self-reports of attention, basis, certainty, ease, face, image, strangers, time, view, and willing, both at Time 1 and at Time 2 (all *p*s ≤ .01, see Appendix C for variable descriptions).  Because the postidentification feedback effect has been widely established and the present research was not intended to examine the effects of feedback on the self-report variables, details regarding the pair-wise analyses for each of these variables will not be provided, but means are reported in Table 3.  Instead, a one-way MANOVA was conducted for all ten self-report variables, with the time variable being reverse-coded. Past research has used MANOVAs to examine these variables together because they can be conceived of as underlying a common "witness self-reported reliability" dimension. In other words, witnesses who tend to report that they were highly certain also tend to have higher standing on the other criteria, and vice versa.

During the first session, participants who received confirming feedback had a significantly higher standing on the "witness reliability" criteria than participants who received disconfirming feedback or no feedback (*p*s < .01).  The self-reports of participants who received disconfirming feedback were lower than those of participants

in the control group, and this difference was marginally significant ($p = .09$). The same pattern (Confirming > Control > Disconfirming) held for participants' reports during the second session, however all three groups' Time 2 reports were statistically different from one another (all $p$s <.01).

**Table 2 - Time 1 and Time 2 Self-Report Dependent Measures**

|  | Confirming | | Disconfirming | | Control | |
|---|---|---|---|---|---|---|
|  | Time 1 | Time 2 | Time 1 | Time 2 | Time 1 | Time 2 |
| Certainty | 75.4 (18.2) | 83.2 (19.0) | 46.1 (25.4) | 45.4 (26.0) | 56.1 (29.0) | 54.2 (29.0) |
| View | 9.46 (1.52) | 9.41 (1.59) | 7.90 (2.02) | 7.61 (1.97) | 8.58 (2.58) | 8.61 (2.35) |
| Face | 8.43 (1.88) | 8.46 (1.88) | 6.93 (1.90) | 7.15 (2.02) | 7.89 (2.46) | 8.17 (2.09) |
| Attention | 8.62 (1.77) | 8.49 (2.06) | 7.05 (1.96) | 6.78 (2.16) | 7.92 (2.14) | 7.94 (2.11) |
| Basis | 8.62 (2.03) | 8.54 (1.84) | 6.68 (2.06) | 5.90 (2.30) | 7.92 (2.14) | 6.72 (2.75) |
| Ease | 7.38 (2.31) | 7.89 (1.98) | 3.90 (2.40) | 3.95 (2.01) | 5.78 (2.60) | 6.17 (2.81) |
| Time | 5.30 (2.30) | 5.19 (2.20) | 7.34 (2.22) | 6.93 (2.45) | 5.81 (3.11) | 5.92 (3.15) |
| Willing | 7.89 (2.46) | 8.14 (2.32) | 3.56 (2.51) | 3.41 (2.10) | 5.28 (3.02) | 5.25 (2.90) |
| Strangers | 7.81 (1.94) | 7.95 (1.80) | 6.00 (2.62) | 5.93 (2.22) | 7.56 (3.00) | 7.67 (2.56) |
| Image | 8.22 (1.53) | 7.51 (2.06) | 6.20 (2.22) | 5.93 (2.42) | 7.50 (2.38) | 7.53 (2.18) |

*Mean*(SD)

## *Ancillary analyses*

The nature of the time-delay paradigm used in the present research allowed for an assessment of change in witnesses' retrospective self-reports from the first session to second session, 48-hours later. Past research has found that eyewitness confidence increases as a result of repeated questioning (Shaw, 1996; Shaw & McClure, 1996) or if witnesses are told to prepare for cross-examination (Wells et al., 1981). In the present

study, participants were instructed to prepare for additional questioning, and they answered questions about their certainty, attention, view etc. two times. Thus, there is some reason to expect that participants' certainty would be higher at Time 2 than at Time 1. On the other hand, the well-established finding that people are motivated by a need to appear consistent with their previous behaviors and commitments (Cialdini & Trost 1998) poses the possibility that participants' self-reports may not vary significantly between sessions. Because participants answered all of the self-report questions during the first session, they should, in theory, be committed to those responses (if they can recall them), and, therefore, give consistent responses during the second session.

To investigate these competing hypotheses, difference scores were computed by subtracting participants' Time 1 scores from their Time 2 scores for all the self-report variables. A positive difference score indicates an increase from Time 1 to Time 2 and a negative difference score indicates a decrease from Time 1 to Time 2. A one-way ANOVA on the difference scores (equivalent to a test of the condition by time interaction) indicated that there was a significant effect of feedback condition for the difference in participants' identification certainty, $F(2, 111) = 3.47$, $p = .04$. The reported certainty for participants who received confirming postidentification feedback increased substantially ($Mdiff = 7.8$; $t(36) = 3.813$, $p = .001$) from Time 1 to Time 2 relative to the certainty reports of the disconfirming feedback and no feedback groups, which remained relatively stable over the 48-hour delay, (Disconfirming $M = -.7$, No feedback $M = -1.9$). Follow-up Games-Howell simple effects tests revealed that there was a significant difference between the confirming feedback and no feedback groups, $Mdiff = 9.8$, $p = .02$, $d = .66$, 95% CI [1.3, 18.3], and a marginally significant difference between the

confirming feedback and disconfirming feedback groups, *Mdiff* = 8.6, *p* = .08, *d* = .50, 95% CI [-0.7, 17.9]. The difference scores for the disconfirming feedback and no feedback groups did not differ significantly.

A significant effect of feedback condition was also found for the change in participants' reported basis for having made an identification, $F(2, 111) = 3.29$, *p* = .04. Participants in the control group exhibited more of a decrease in the belief that they had a good basis to have made an identification during the first session (*M* = -1.19) than did participants who received confirming feedback (*M* = -.08) or disconfirming feedback (*M* = -.78). Games-Howell pair-wise comparisons indicated that the only significant difference was between the confirming feedback and no feedback groups, *Mdiff* = 1.11, *p* = .03, *d* = .64, 95% CI [.10, 2.12]. None of the participants' responses on the other self-report measures differed significantly from Time 1 to Time 2.

CHAPTER 6.  DISCUSSION

*Primary Measures*

The principal aim of this experiment was to test the hypothesis that postidentification feedback hampers witnesses' recognition memory of the originally-witnessed culprit.  This was carried out by comparing similarity ratings, rankings, and identification choices in a memory test of individuals who received confirming feedback, disconfirming feedback, or no feedback about their inaccurate identification.  Results suggest that postidentification feedback has some negative consequences for eyewitness memory.  It was found that giving participants feedback about an identification that is inaccurate can hamper their ability to make recognition-based distinctions between the originally-witnessed culprit and other never-before-viewed individuals.  Participants who received disconfirming feedback exhibited the lowest performance on the three aspects of the memory test (similarity ratings, rankings, and identification accuracy).  Participants who received confirming feedback also tended to underperform relative to participants in the control group; however, these differences failed to reach statistical significance.

It is interesting to note that feedback primarily exerted an influence on the similarity ratings for the filler photo ratings rather than for the culprit's photo.  All three feedback groups rated the culprit as being relatively equally similar to their memory of the culprit; group differences only emerged on the similarity ratings of the filler photos. Participants in the disconfirming feedback condition (and to a lesser extent, the confirming feedback condition), rated the filler photos as relatively more similar to their memory of the culprit than did the control group.  Supporters of the McCloskey and Zaragoza (1985) argument that the original memory trace is not affected by

misinformation would likely see these data as consistent with the notion of memory permanence.  Indeed, the present findings seem to suggest that the feedback created memory interference by planting additional faces in memory without actually harming memory for the original face. Nevertheless, this effect of feedback on filler similarity ratings resulted in smaller difference scores between the culprit and the fillers for the groups that received feedback relative to the control group.  To put it a different way, giving participants feedback about their inaccurate identifications seemed to impair their ability to discriminate between the culprit and never-before-seen individuals.

Further evidence supporting the claim that feedback negatively affects witnesses' recognition memory can be seen in the pattern of choosing accuracy rates.  When prompted to make an identification, participants who received feedback tended to be less accurate at picking out the culprit from the set of photos than participants who were not given feedback about their identification.  This effect was not due to a difference in the belief or expectation that the culprit was in the second photo set; the three groups were equally likely to respond "yes" to the question "Do you think any of the people in the lineup was the person from the video?"  This is an important consideration because it rules out the possibility that the feedback manipulation led some participants, but not others, to be more or less likely to believe that the man from the video was in the photo spread.

Given that the clearest effects of feedback were when it was disconfirming, the focus of the discussion will be oriented predominantly around the finding that disconfirming feedback leads to a decrease in memory test performance.  Recall that predictions regarding the effects of disconfirming feedback on witness memory took two

forms. The first hypothesis was that witnesses who received disconfirming feedback would retain a stronger memory of the originally-witnessed culprit. This was based on the idea that if witnesses are "forced" to make an identification from a lineup, they may pick someone who does not exactly match their memory of the culprit. Thus, being told that their identification was inaccurate would allow them to revert back to their memory of the culprit from the video, thereby reinforcing the (accurate) memory. Conversely, the second hypothesis—the memory interference hypothesis—held that disconfirming feedback would negatively affect witnesses' memory of the culprit. The memory-interference hypothesis was based on the idea that that to the extent that witnesses assume that the culprit was present in the first lineup, disconfirming feedback suggested to them that their judgment of who looked most like the culprit was incorrect and that it was one of the rejected lineup members instead. Because the rejected lineup members were less similar to the culprit than was the identified lineup member, there was greater potential to lead them to adjust their memories away from their original memory and toward one of the rejected lineup members. This was presumed to be a potential source of interference that would lead to decreased performance on the memory test. Because participants in this study were given biased lineup instructions that have been shown to increase the expectation that the culprit is present in the lineup (e.g., they were not told that the culprit may or may not be present and they were not given an option to select "not there"), it is reasonable to think that participants who received disconfirming feedback assumed that the culprit was one of the rejected members of the lineup.

The results of this study lend support to the memory-interference hypothesis; participants who received disconfirming feedback performed more poorly on a test of

recognition memory than did participants who did not receive feedback.  Whereas individuals in the confirming feedback group were confronted with interference resulting from the reinforcement of the misidentified individual, participants who received disconfirming feedback were potentially faced with interference from a number of photos—as many as five—from the first lineup who, on average, would resemble the culprit less than did the one they originally identified.  The resulting interference would conceivably be more destructive, then, for participants who received disconfirming feedback than for those who received confirming feedback.  Hence, the memory-interference interpretation posits a general process that underlies memory impairment for both feedback groups: postidentification feedback reinforces a memory (or memories) that interfere(s) with witnesses' memory for the originally-witnessed person.  Confirming feedback leads to the reinforcement of the misidentified person, whereas disconfirming feedback leads to the potential reinforcement of rejected members of the initial lineup, thereby causing decreased performance on a memory test of the culprit.

Another possible interpretation for the decreased performance of participants who received disconfirming feedback is that the feedback caused them to doubt the accuracy of their own memory. If participants who received disconfirming feedback simply lost confidence in their memory, the results of this study could be explained by the idea that these participants strategically exhibited caution when they completed the memory test. For example, they may have avoided making any extreme judgments or commitments to any of the photographs because they had already in a sense been "burned" by a bad decision.  This interpretation would not require a memory impairment to have occurred at

all; rather, the pattern of results may simply reflect a deliberate attempt to avoid being wrong again.

Perhaps the best evidence against this interpretation is that participants in the disconfirming feedback group were no less likely to voluntarily attempt to identify the culprit during the final memory test, suggesting that they were not simply "gun shy", but rather that their memory was legitimately impaired by the feedback. Furthermore, the relative extremity of participants' ratings for the culprit's photograph did not differ between feedback conditions. It was the similarity ratings of the filler photos that contributed primarily to differences in discriminatory recognition memory between groups. If the impaired performance of participants who received disconfirming feedback was due to a strategic effort to exhibit caution during the memory test, it is not clear why participants would not have rendered a more conservative judgment on their similarity rating for the culprit. The memory-interference interpretation provides a more parsimonious explanation for the observed pattern of results.

The results become even clearer when one considers the unique characteristics of the interfering lineup photographs for participants who received disconfirming versus confirming feedback. It is safe to say that most, if not all, of the participants chose from the first lineup the person who most closely resembled their memory of the man in the video. Indeed, there is a strong line of research indicating that when witnesses expect that the culprit is in the lineup, they tend to choose the person who, relative to the other members of the lineup, most closely resembles their memory of the culprit (Wells, 1984). An examination of the choosing rates from the first lineup indicated that one of the lineup members, Number 4, was preferred above all others; he was chosen by 54.4% of the

sample, with the remainder of the identifications being distributed more or less evenly across the other photos. The fact that Number 4 was chosen by a majority of the participants suggests that, relative to the other lineup members, he most closely matched the appearance of the culprit. It stands to reason, then, that reinforcing this choice among the confirming feedback group could potentially benefit those participants in terms of the subsequent memory test because it reinforces the image of the person who is arguably the most similar in appearance to the actual culprit.  On the other hand, telling participants in the disconfirming feedback group that they made an inaccurate identification may suggest that the culprit looks different than the misidentified individual.

If this proposition is true, then it would be expected that participants who received confirming feedback after choosing photo Number 4—the closest match to the culprit— would perform better than participants who received confirming feedback after choosing someone other than Number 4. It would also be expected that the performance of participants who received disconfirming feedback after choosing Number 4 would be lower than participants who chose Number 4 but were given no feedback.  An examination of the choosing accuracy rates for the three conditions supports both of these predictions (Table 4).  And it is not the case that participants who failed to pick Number 4 from the first lineup were simply worse witnesses than participants who picked Number 4; in the control group, the choosing accuracy rates were effectively identical for those who chose Number 4 and those who did not.  But participants who received confirming feedback after picking photo Number 4 were more accurate in identifying the culprit during the memory test than were participants who received confirming feedback after choosing someone other than Number 4 ($\chi^2 = 4.75$, $p = .04$).  This finding is particularly

interesting because it violates the general pattern that has been seen thus far—namely, that the confirming feedback group tended to perform more poorly on the memory test than the control group. In fact, participants who were given confirming feedback after picking photo Number 4 had the highest choosing accuracy rates (94% accuracy).

**Table 4 - Identification Accuracy Rates by Condition and Filler Selection**

|  | Confirming | Disconfirming | Control |
|---|---|---|---|
| Chose Number 4 | 94.74% | 79.17% | 89.47% |
| Did not choose Number 4 | 66.67% | 58.82% | 88.24% |

In contrast, participants who picked photo Number 4 but then received disconfirming feedback were relatively less accurate in identifying the culprit during the final memory test (79% accuracy) relative to control group participants who chose Number 4 (89% accuracy). Finally, participants who picked someone other than Number 4 from the first lineup and then received disconfirming feedback were the least accurate during the memory test identification task (59% accuracy). A plausible explanation for this finding is that the effects of disconfirming feedback for participants who chose someone other than Number 4 were particularly devastating because the feedback "moved them away" from an identification of someone who did not closely resemble the culprit to begin with.

Because the majority of participants picked photo Number 4 from the first lineup, it can be argued that on the whole, participants who received confirming feedback had a relative advantage over those who received disconfirming feedback because the

misinformation that they received was not as discordant with their original memory as it was for those who were given disconfirming feedback. In other words, the misinformation that was given to the disconfirming feedback group (that the person who best matched their memory of the culprit was not the culprit) may have led them astray from their original, potentially rather strong memory of the culprit. These results beg the question of what happens in the real world when a suspect who does not very closely resemble the crime culprit is mistakenly identified and reinforced with confirming feedback. According to the relative judgment conceptualization (Wells, 1984), this may happen more often than one might expect, because relative judgments allow the witness to make an identification based on relative, rather than absolute, similarity judgments. Because there will always be someone who most closely matches the appearance of the culprit than do the other lineup members, the person who ends up being identified may actually look quite dissimilar to the person who committed the crime. These findings suggest that the degree to which the misidentified person resembles the culprit is an important determinant of the amount of memory interference that may result from reinforcement of the misidentification.

Another argument that can be made in light of the present data is that witnesses with the weakest memory are the ones who are most affected by postidentification feedback. To the extent that we can assume that participants who chose someone other than Number 4 from the culprit-absent lineup were the participants with the weakest memory, it suggests that the feedback effects on memory might be greatest for witnesses who, for whatever reason, have a weaker memory to begin with. In theory, witnesses with a very strong memory of the culprit may be able to perform reasonably well on a

recognition memory test, even when they are first forced to make an identification and then are given misleading postidentification feedback. In this study, overall memory is rather strong. Participants had a clear view of the culprit's face in a high quality color video, and their memory of the culprit was tested just 48-hours after viewing the video. Introducing an appreciably longer delay, giving participants a poorer view, or implementing any other manipulation that serves to reduce the quality of participants' initial memory may have led to more pronounced effects of feedback on the final memory test. Because this study did not manipulate memory strength, conclusive statements cannot be made about the role played by memory strength in moderating the effects of feedback on memory of the culprit. However, results of the above analyses suggest that feedback may be most impactful when witnesses' memory is weaker.

### *Ancillary measures*

Another interesting and perhaps unexpected finding was that the certainty of participants who received confirming postidentification feedback increased from Time 1 to Time 2 whereas the certainty reports of participants in the disconfirming and no feedback conditions remained stable over time. Past research has found that eyewitness confidence increases as a result of repeated questioning (Shaw, 1996; Shaw & McClure, 1996) or if witnesses are told to prepare for cross-examination (Wells et al., 1981). It is important to point out that the present experiment did not specifically manipulate participants' expectations for cross-examination or the number of times participants were questioned; all participants were told that they would be asked additional questions about their identification, and all participants were questioned two times. But in the present study, it was only among the confirming feedback group that an inflation of certainty

occurred, suggesting at the very least that the tendency for certainty to become inflated may be even more pronounced among witnesses who receive confirming postidentification feedback. Furthermore, it is reasonable to presume that the observed effect would be even stronger if participants were not asked about their certainty during the first session. Indeed, providing an initial certainty statement may have anchored participants to their response, thereby limiting the extent to which inflation could occur.

The dominant theory of how confirming postidentification feedback exerts such strong effects on witnesses' retrospective certainty reports may be able to shed some light on this intriguing finding. According to the theory, witnesses do not form online memory traces for how certain they were at the time of the identification, so witnesses who receive postidentification feedback rely on the feedback to infer and reconstruct their level of certainty when they are asked (Wells et al., 2003). The feedback effect is theorized to persist over time because witnesses' memory trace for their pre-feedback certainty is weak (if present at all), but the memory for the feedback itself remains relatively strong. It is not a far stretch to reason that as time passes, witnesses' internal cues to their pre-feedback certainty become increasingly weaker while memory for the feedback remains quite robust, thereby exerting a disproportionate influence on witnesses' retrospective certainty estimates with the passage of time. Why then, wasn't there a parallel affect of certainty deflation for participants who received disconfirming feedback? One possibility is that participants who received disconfirming feedback remembered being surprised by the feedback. Given that they probably "gave it their best shot" during the first identification, they may have experienced a feeling of surprise when they were told that their identification was inaccurate. If participants remembered

the feedback and their reaction to the feedback, this could have provided a clue about their level of certainty before the feedback, rendering it less susceptible to deflation effects. Another possibility is that floor effects were at play for participants who received disconfirming feedback. Their certainty at Time 1 was below the midpoint of the scale (45.4%), which was already considerably lower than the 56.1% certainty of the control group. It would be improbable for participants in the disconfirming feedback group to report having been even less certain, given the necessity of having some justification for making an identification.

Little research has examined whether the effects of postidentification feedback on witnesses' certainty reports vary as a function of when the certainty report is collected, and the research that has been conducted is rather inconclusive. In a study by Wells, Olson, and Charman (2003), feedback and time delay for the collection of a certainty statement were manipulated. Witnesses received confirming, disconfirming, or no feedback, and they were asked about their certainty immediately after receiving feedback or after a 48-hour delay. Although not statistically significant, the data conformed to a similar pattern as was seen in the present work. Specifically, witnesses who received confirming feedback and were asked immediately about their certainty were on average 64% certain in their identification, whereas witnesses who received confirming feedback and were asked about their certainty 48 hours later were on average 76% certain in their identification. Further paralleling the present findings, the control group in the Wells et al. study showed less of an increase from immediate to delayed assessments (6%), and the disconfirming feedback group showed a slight decrease from immediate to delayed assessments (-4%), though neither of these differences was statistically significant. The

12-point inflation among the confirming feedback group in the Wells et al. study was an even larger increase than the 7.8-point increase in the present study.  So why wasn't their result statistically significant?  It could be due to the fact that certainty was a between-subjects variable in the Wells et al. study—witnesses were asked about their certainty either immediately or after 48 hours, whereas in the present research, it was a within-subjects variable—witnesses were asked about their certainty immediately and again after 48 hours.  Lacking the benefit of within-group comparisons, the standard deviations in the Wells et al. study were slightly larger than they were in the present study.  On the whole, their findings are consistent with the notion that the certainty of witnesses who receive confirming feedback may continue to inflate over time, whereas the certainty of witnesses who receive disconfirming or no feedback seems to remain relatively stable.

In another study, Neuchatz and his colleagues (2007) manipulated feedback and delay of confidence assessment in an examination of the efficacy of a confidence prophylactic, which is designed to protect against the inflating effects of feedback.  All witnesses were asked to rate their confidence after their identification and before the experimental manipulations (confidence prophylactic).  Some witnesses were then given confirming feedback and others were given no feedback.  Witnesses completed a confidence assessment either immediately or after a one-week delay.  The mean level of confidence was 4.1 (on a seven point scale) for witnesses who were asked about their certainty immediately after receiving feedback and 5.4 for witnesses who were interviewed after the one-week delay.  The researchers concluded that the confidence prophylactic works immediately but not after a period of delay, but the results of the current research provide a different perspective on these data.   Because the researchers

did not include a control group with no confidence prophylactic, there is no way to know whether the inflation in witness certainty between the immediate and delay conditions was truly due to the confidence prophylactic wearing off or if witnesses who received confirming feedback became more confident over time. In other words, it is possible that there was a main effect of the confidence prophylactic in addition to a main effect of the passage of time. It is impossible to draw any definitive conclusions from these data, but they are certainly not inconsistent with the current study's findings.

There are some limitations to the present research that need to be considered. First, at the time of the final memory test, participants were still under the impression that the feedback was accurate. Although this was seen as a unique and desirable characteristic of the present study, it would also be useful to perform another experiment in which the feedback is discredited before witnesses are tested on their memory. This is what sometimes happens in the real world when witnesses are informed that the person they misidentified is found to be factually innocent. A replication of the present findings under these circumstances would provide even stronger evidence in support of the idea that postidentification feedback about an inaccurate identification impairs witnesses' memory of the original culprit.

Another limitation of the present research is with regard to the apparent certainty inflation that occurred over time among participants in the confirming feedback group. Because the change in participants' certainty between Time 1 and Time 2 was of peripheral interest to the present study, the order in which the certainty measure was collected may have created a peculiar confound. Before participants were asked about their certainty during the second session, they performed other tasks such as rating,

ranking, and picking from a photo spread the person who they believed most resembled the man from the video. Critics could argue that characteristics particular to these tasks are responsible for the certainty inflation effect. However, this contention does not seem like a plausible explanation for the results because the certainty inflation occurred only among the participants who received confirming feedback. There is no apparent reason that performing the memory test tasks during the second session would uniquely inflate the certainty of participants who received confirming feedback. On the other hand, there is theoretical support for the idea that certainty inflation would occur over time for witnesses who received confirming postidentification feedback. It could be the case that time exerts an influence only when witnesses have already "started in the direction" of feeling more confident. In other words, providing confirming postidentification feedback may start a process of inflation that continues to grow as witnesses' memory for their phenomenological experience of the identification fades and the memory for the feedback remains. But, these are theoretical speculations that should be tested in future research.

Future research can rather easily deal with the limitations of this work as well as address some of the theoretical interpretations that were proposed as opposing accounts to the memory-interference hypothesis. It would be useful to test the possibility that decreased performance on the final memory test among participants who received disconfirming feedback resulted because of an increased caution and an avoidance of making extreme judgments during the final test. Although multiple internal analyses largely discredited this interpretation, it is important to rule it out more definitively. More importantly, it is critical to perform an empirical test of the memory-interference hypothesis, which is based on the assumption that the poor performance of participants in

the disconfirming feedback condition was due to interference from other members of the first photo lineup. Future research should examine whether witnesses who receive disconfirming feedback actually attempt to recall the other photos from the first lineup. If this were the case, witnesses should be expected to have (1) believed that the culprit was someone else in the first lineup and (2) deliberately reflected about the other members of the lineup after they received disconfirming feedback. These two points could be addressed in a study that asks witnesses (1) whether or not they believed that the culprit was someone else in the lineup and (2) whether they found themselves "thinking back" to the first lineup in an effort to determine who was the culprit. Another method of examining whether this reasoning took place without relying on witnesses' self-reports of their mental processes is to give witnesses a test of their memory for the filler photos. If giving disconfirming feedback prompts witnesses to attempt to recall the other photos from the first lineup, then we would expect them to have a stronger memory for these photos than would the other two groups. Yet another way to test the memory-interference hypothesis as it applies to the disconfirming feedback group is by manipulating the expectation that the culprit is present in the first lineup or by outright telling witnesses that the culprit is not in the lineup. This would obviate the necessity for witnesses to recollect the first lineup, and these witnesses should then show equal performance to the control group on a memory test of the culprit. Until these empirical tests are carried out, the memory-interference interpretation provides a coherent explanation for the present research finding that postidentification feedback negatively affects witness memory, with disconfirming feedback being relatively more destructive than confirming feedback.

The lack of highly statistically significant effects of feedback on memory test performance could be interpreted as a lack of support for the hypothesis that feedback impairs witnesses' ability to later recognize the originally-witnessed culprit. On the other hand, the fact that the hypothesized trends were observed at all within the present experimental paradigm could be viewed as rather compelling, albeit preliminary, support of the hypothesis. The misinformation-absent test is known to be rather insensitive to detecting misinformation effects. Nevertheless, recognition memory test performance was impaired by the feedback. Moreover, participants in this study were under little stress during the witnessed event and had a rather strong memory to begin with, had minimal personal investment in the outcome of their performance, and completed the memory test only 48 hours after witnessing the original event. What might have happened if other characteristics that exist in real cases were included in the study? For example, over the course of criminal cases, an eyewitness will likely view the original photo lineup on multiple occasions. The witness may also be exposed to pre-trial publicity in which the identified person's image is depicted in local media sources. Furthermore, real eyewitnesses to crimes are usually highly personally involved with the event, especially if they were the victim of the crime. The results of this study suggest that any factor that makes postidentification feedback more salient or that makes witnesses' initial memory of the culprit weaker would lead to even more pronounced feedback effects on memory.

In the case of Jennifer Thompson, there were multiple and extended sources of confirming feedback regarding her identification of Ronald Cotton. First, Jennifer was given feedback by the detective after making the identification from the photo lineup and

from the live lineup.  In addition, a second rape victim came forward after Jennifer's trial

and fingered Cotton as her rapist.  Perhaps the ultimate reinforcement was the fact that

Ronald Cotton was convicted of both rapes and served hard time in prison.  In contrast to

laboratory settings, in the real world there is often repeated reinforcement and the

influence of such reinforcement is magnified.  To the extent that the present study

produced overly favorable conditions for memory and thus failed at fully simulating a

real eyewitness' experience, the observed effect may not have had the robustness that it

would have in the real world.  Future research that exposes participants to a staged crime

and more closely reproduces the powerful reinforcements that often occur in real cases of

eyewitness identification may better uncover the magnitude of this effect.  Nevertheless,

the present research can be viewed as preliminary support for the contention that

postidentification feedback has deleterious consequences for witnesses' recognition

memory of the culprit.

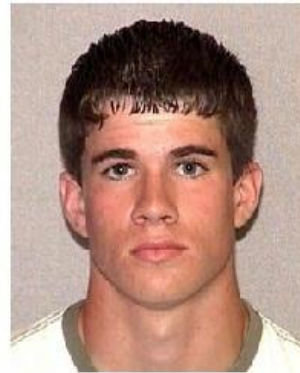APPENDIX A.  STILL SHOTS FROM VIDEO

APPENDIX B.  CULPRIT-ABSENT LINEUP

APPENDIX C.  SELF-REPORT MEASURES

| Question (variable names in bold) | Scale |
|---|---|
| At the time you identified the person from the photo lineup, how **certain** were you that the person you identified from the photo lineup was the person you saw in the video? | 10% (not at all certain) to 100% (totally certain), in 10% intervals |
| How good a **view** did you get of the person in the video? | 0 (very poor) to 10 (very good) |
| How well were you able to make out specific features of the person's **face** from the video? | 0 (not at all) to 10 (very well) |
| How much **attention** were you paying to the face of the person in the video while viewing the tape? | 0 (none) to 10 (my total attention) |
| To what extent do you feel that you had a good **basis** to make an identification? | 0 (no basis at all) to 10 (a very good basis) |
| How easy or difficult was it for you to figure out which person in the photo lineup was the person from the video? (**ease**) | 0 (extremely difficult) to 10 (extremely easy) |
| From the time the lineup started, how much **time** do you estimate it took you to make an identification? | 0 (I needed almost no time) to 10 (I had to think about the lineup for a long time) |
| On the basis of your memory of the person in the video, how **willing** would you have been to testify in court that the person you identified was the same person you saw in the video? | 0 (not at all willing) to 10 (totally willing) |
| Generally, how good is your recognition memory for faces of **strangers** you have encountered on only one prior occasion? | 0 (very poor) to 10 (excellent) |
| How clear is the **image** you have in your memory of the person you saw in the video? | 0 (not at all clear) to 10 (very clear) |

APPENDIX D.  CULPRIT-PRESENT LINEUP
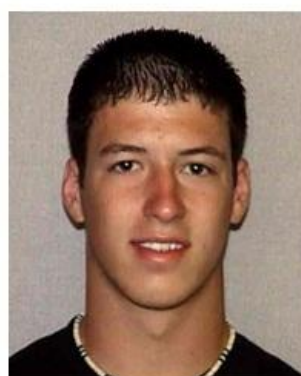


Culprit is Number 3

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