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SYSTEM AND ESTIMATOR VARIABLES IN EYEWITNESS IDENTIFICATIONS:
EFFECTS ON ACCURACY AND THE
POSTIDENTIFICATION FEEDBACK EFFECT

Thesis

Submitted to

The College of Arts & Sciences of the
UNIVERSITY OF DAYTON

In Partial Fulfillment of the Requirements for

The Degree

Master of Arts in Psychology

By

Dario N. Rodriguez

UNIVERSITY OF DAYTON

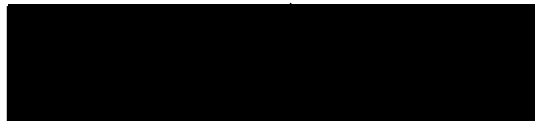
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May 2008

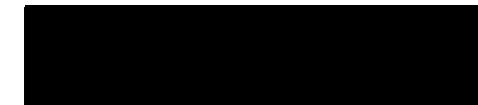
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ABSTRACT

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System and estimator variables were examined regarding their influence on participant eyewitnesses' susceptibility to postidentification feedback using a customized computer program. Participants viewed a 20 s mock crime video depicting an attempted car theft and, following a delay (15 min or 1 week), attempted to make an identification from a photo lineup (sequential or simultaneous, target-present or target-absent). After making an identification decision, half of the participants received confirming postidentification feedback (specific for identifications or non-identifications). Following a second delay (15 min or 1 week), participants' retrospective reports were assessed using a brief questionnaire. Results indicate that the conceptualization of the postidentification feedback effect as a function of the relative strength of internal to external cues may not be appropriate. Alternatively, viewing the effect as related to the hindsight bias accounts for the results well.

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CHAPTER 1

INTRODUCTION

Well-known TV programs such as *CSI* and *Law and Order* have contributed to the rise in popularity of forensic research over the past several years, but research psychologists' interest in the intersection of psychology and the legal system has existed for nearly a century. Although the degree of interest in forensic psychology has waxed and waned over the decades, its roots can be traced to the publication of Hugo Münsterberg's (1908) groundbreaking book, *On the Witness Stand* (Wrightsman & Fulero, 2005). Münsterberg was one of the first researchers to outline the utility of applying psychological principles to the legal arena. Recently, academic interest in psychological issues surrounding lineup administration, interrogation techniques, and false confessions has increased tremendously (Wrightsman, 2001). In addition to receiving research attention, these forensic issues are also becoming more widely known to the public at large. For example, the findings of the Illinois Police Department eyewitness identification investigation (Mecklenburg, 2006a, 2006b, 2006c) and the conviction of 17-year-old Marty Tankleff (*People v. Tankleff*, 1990) have drawn much media attention (e.g., Dowdy & Topping, 2005; Zernike, 2006) and brought the issues associated with eyewitness identifications and false confessions into the public eye.

Eyewitness identification is one of the many areas of forensic psychology that has the potential to spark heated debates among forensic researchers. Currently there is

disagreement among researchers as to some of the procedures that police personnel should use (e.g., Ebbeson, 2006; Ebbeson & Flowe, 2001; Malpass, 2006; McQuiston-Surrett, Malpass, & Tredoux, 2006, cf., Wells, Malpass, et al., 2000; Wells, Memon, & Penrod, 2006; Wells, Small, et al., 1998), and regarding whether sufficient certainty exists in the literature to warrant the immediate changes called for by some researchers (e.g., Wells, Small et al., 1998). Recent advances in forensic psychology have increased the eyewitness memory knowledge base and led to many changes in law enforcement policy recommendations regarding lineup identification procedures (Technical Working Group for Eyewitness Evidence, 1999, 2003). For example, Wisconsin's new model for eyewitness identification recommends the use of double-blind, sequential lineups that include innocent fillers (to minimize suggestiveness), non-biased instructions, and the immediate assessment of eyewitness identification confidence (*Model Policy and Procedure for Eyewitness Identification*, 2005). Although important applications of forensic findings are becoming more evident in police procedures, much is still left unexplored. The quest to understand the variables involved in the eyewitness identification process is just beginning.

Factors Affecting Accuracy

Forensic psychologists have already identified many variables that can influence eyewitnesses in their identification of a suspect from a photo or live lineup. These variables are classified into two distinct categories: estimator variables and system variables (Wells, 1978). Estimator variables are aspects of the crime event that influence eyewitnesses' memory and, therefore, their ability to make accurate identifications. Some examples of estimator variables include characteristics of the criminal (e.g., the use

of a disguise), characteristics of the witness (e.g., stress, the quality of the witness's view of the perpetrator), and environmental conditions (e.g., the lighting at the time of the crime, whether a weapon was present during the crime). Extensive research has documented the influence of estimator variables on eyewitnesses' ability to identify culprits accurately (e.g., Cutler, Penrod, & Martens, 1987; Narby, Cutler, & Penrod, 1996; Pickel, 1999; Steblay, 1992; Wells, 1984; Wells & Loftus, 2003). Because they are aspects of the event itself, estimator variables are beyond the control of the individuals responsible for investigating the crime. However, it is important that the influence of estimator variables be understood and communicated to the triers of fact (e.g., jurors, judges) in legal proceedings.

In addition to the extensive literature on estimator variables, a considerable portion of the eyewitness research has been conducted on system variables (see Wells, Memon, et al., 2006). System variables are procedural factors that may influence the accuracy of an eyewitness's decision. They are factors that crime investigators do have the power to control. Some examples of system variables include lineup construction, the instructions given to witnesses prior to the administration of the lineup, the method of lineup presentation, and the behavior of those administering the lineup. Because they are factors that can be controlled by law enforcement, system variables can be modified to effect real change in applied settings (Wells & Olson, 2003). In an effort to contribute to this knowledge base, the current research is focused on the influence of both system and estimator variables.

Many problems can occur at various points in the identification process. Forensic research on live and photo lineups has revealed that the methods used by police during

these identifications are often inherently flawed and can unduly influence eyewitnesses in their identifications. In a typical photo lineup, photos of multiple subjects are presented to the eyewitness simultaneously, often in what is called a “six pack” (i.e., two rows of three suspect photos). Substantial research indicates that presenting photos in this type of simultaneous lineup leads the eyewitness to make an identification by employing a relative judgment process (Kneller, Memon, & Stevenage, 2001; Wells, 1993; Wells, Memon et al., 2006; Wells, Small et al., 1998). That is, the witness often selects the individual featured who, in the witness’s memory, most resembles the perpetrator relative to the other individuals shown. In other words, the eyewitness compares the individuals’ faces to each other and makes a selection from the available options rather than exclusively comparing each face to his or her memory of the perpetrator’s face to make an identification. Research has shown that this type of judgment process can lead to a high rate of misidentification, especially in simultaneous, culprit-absent lineup (e.g., Kneller et al., 2001; Wells, 2006; Wells & Olson, 2003). This specific finding has implications for real-world situations in which a particular suspect is believed to be guilty, but is, in fact, innocent. Although this judgment process is potentially not as troublesome when the actual perpetrator of a crime is included in a lineup, if the lineup contains a suspect who is wrongly accused, the innocent person who most closely resembles the perpetrator may likely be identified as the perpetrator rather than correctly nonidentified (Kneller et al., 2001; Wells, 1993; Wells, Small et al., 1998).

One procedure that has been proposed to help reduce this relative judgment problem is the presentation of suspect photos sequentially (i.e., one at a time), rather than simultaneously (Lindsay & Wells, 1985; Wells, 1984; Wells, Memon et al., 2006; Wells,

Small et al., 1998). Using this method, eyewitnesses are required to determine whether or not the one suspect shown is the perpetrator of the crime before being shown the remaining suspects' photos. The sequential presentation of photos makes a "multiple choice" style of identification much more difficult, reducing eyewitnesses' reliance on the relative judgment process while encouraging an absolute judgment process (Lindsay & Wells, 1985; Lindsay et al., 1991). Eyewitness identification researchers have found that because the sequential method of lineup presentation encourages an absolute judgment process, eyewitnesses are more sensitive to the presence or absence of the perpetrator in a lineup when viewing a sequential lineup as opposed to a simultaneous lineup (see Wells, 1993, for a discussion of the removal-without-replacement effect; see also, Cutler & Penrod, 1988; Kneller et al., 2001; Lindsay et al., 1991; Sporer, 1993; Wells & Olson, 2003). That is, eyewitnesses presented with a sequential lineup are more likely to correctly reject a lineup composed of all innocent individuals (i.e., fillers and innocent suspects).

Many studies on sequential and simultaneous lineups have indicated the possibility of an interaction between method of photo presentation and target presence (i.e., whether or not the perpetrator is placed in the lineup). Lindsay and Wells (1985) found that sequential lineups yielded comparable rates of correct identifications in target-present lineups, but much higher rates of correct rejections in target-absent lineups when compared to simultaneous lineups, an overall increase in accuracy rates now called the "sequential superiority effect." A meta-analysis conducted by Steblay, Dysart, Fulero, and Lindsay (2001) revealed that identification accuracy rates were higher in target-present, simultaneous lineups than in target-present, sequential lineups (50% vs. 35%,

respectively), and that correct rejections were significantly higher in target-absent, sequential lineups than in target-absent, simultaneous lineups (72% vs. 49%, respectively). An updated meta-analysis using additional studies on the phenomenon yielded very similar results (Stebay, 2007). Unfortunately, research has also shown that, overall, both methods of presenting photos yield unimpressive identification accuracy rates irrespective of target presence; Stebay revealed overall accuracy rates of 55% in sequential conditions and 47.5% in simultaneous conditions.

Low identification accuracy rates raise concerns about how jurors perceive and weigh eyewitnesses' testimony about crimes, including their identifications of suspects. Even though much evidence shows that the certainty with which eyewitnesses testify is not strongly correlated with accurate recollections of people, events, and/or details (Bothwell, Deffenbacher, & Brigham, 1987; Penrod & Cutler, 1995), jurors often perceive the confidence with which eyewitnesses give their testimony as a reliable indicator of accuracy (e.g., Bradfield & Wells, 2000; Brewer & Burke, 2002; Wells, Olson, & Charman, 2002; Whitley & Greenberg, 1986). Because the certainty with which eyewitnesses testify is weighted so heavily by jurors, many forensic psychologists have begun to focus their research on system variables that can impact eyewitnesses' certainty in their identifications of culprits and recollections for crime events (e.g., administrator actions prior to, during, and after the identification process).

There is considerable research evidence to support the idea that eyewitnesses are highly susceptible to the powers of suggestion from police (Luus & Wells, 1994; Wells & Luus, 1990; Wells, Small et al., 1998; Wrightsman & Fulero, 2005). Subtle cues like a lineup administrator's body language or tone of voice during the identification process

can be perceived as guidance and thus may influence an eyewitness to identify one lineup member over another. For example, an administrator might unwittingly encourage an eyewitness to look more closely at a particular lineup member or pressure an eyewitness to make an identification from the suspects presented. Such subtle behaviors may also influence eyewitnesses' identification certainty. To avoid these problems, double-blind identification procedures – when the administrator does not know which, if any, member of the lineup is the actual suspect – have been proposed to help eliminate these possible influences (Wells & Luus, 1990; Wells, Small et al., 1998). By employing this procedure, administrator biases that may influence eyewitness identifications and/or identification certainty are greatly reduced.

Factors Affecting Confidence

Although forensic researchers have long been concerned with factors that may influence eyewitnesses prior to viewing a lineup, only relatively recently has attention been turned to factors that may influence eyewitnesses after the identification task is completed. Studies have shown that eyewitnesses' identification certainty and memories for crime events can change between the time they make an identification and when they are called to provide courtroom testimony regarding that identification (e.g., Loftus, 1979; Wells, 2006; Wells, Olson, & Charman, 2002, 2003; Wrightsman & Fulero, 2005). One specific question researchers have investigated is whether eyewitnesses' reports of identification certainty change based on feedback they receive after they have made their initial decisions (i.e., postidentification feedback). If eyewitnesses' reports of certainty can be influenced by feedback, jurors' perceptions of the accuracy of the witnesses' reports can also be considerably influenced. Because jurors often perceive an

eyewitness's certainty as an indication of accuracy, such effects in court could be disastrous, particularly in situations in which an innocent person is wrongly identified.

Studies have revealed that postidentification feedback has powerful effects on eyewitnesses' recollections of the crime event as well as on eyewitnesses' recollections of the identification task itself, an effect called the postidentification feedback effect (Wells & Bradfield, 1998, 1999). Many researchers have found that eyewitnesses' identification certainty can be influenced by giving them feedback that the suspect they identified was (or was not) the perpetrator of a crime (e.g., Bradfield, Wells, & Olson, 2002; Dixon & Memon, 2005; Douglass & Steblay, 2006; Luus & Wells, 1994; Semmler, Brewer, & Wells, 2004; Rodriguez & Cahoon, 2006; Wells & Bradfield, 1998, 1999; Wells, Olson, et al., 2003). Other studies have shown that this feedback can even influence eyewitnesses' recollections of the witnessing experience. That is, eyewitnesses' memories of specific aspects of the events in question can also be altered by the provision of feedback. For example, witnesses' recollections of the quality of their view of the criminal have been altered as a function of postidentification feedback (Wells & Bradfield, 1999).

Although the postidentification feedback effect has been documented in numerous studies, the underlying mechanism of the effect is not yet clearly understood. Some researchers have argued that the postidentification feedback is conceptually related to Fischhoff's (1977) hindsight bias, or the "I-knew-it-all-along effect" (e.g., Douglass & Steblay, 2006). There are two hindsight bias paradigms that are typically used: the "hypothetical" and the "memory" paradigms. In the hypothetical paradigm, participants learn outcome information and then provide reports about what outcome they would have

predicted. The hindsight bias occurs when participants overestimate the likelihood that they would have predicted the same outcome of which they were informed. In the memory paradigm, participants are asked to predict an outcome and are then provided with outcome information. Later, they are asked about their previous predictions. In this paradigm, the hindsight bias occurs when participants misremember their earlier predictions so that they conform to the outcome information.

Some conceptualize the hindsight bias as an automatic process that occurs outside of conscious awareness, whereby outcome information automatically and permanently distorts participants' recollections of the past ("creeping determinism": Fischhoff, 1975). The hindsight bias is also conceptualized as a motivational process, whereby participants consciously alter their responses or their recollections of original responses when provided with outcome information so as to make a favorable impression (e.g., to appear consistent, knowledgeable, or competent)¹. Applied to an eyewitness identification paradigm, the automatic explanations of the hindsight bias suggest that, when provided with postidentification feedback regarding identification performance, eyewitnesses automatically incorporate this outcome information into their memories, which distorts subsequent recollections of the identification task and, interestingly, the witnessing experience as well; motivational explanations suggest that witnesses alter their reports to be consistent with outcome information to appear credible and to be helpful to investigators and attorneys (Douglass & Steblay, 2006).

Bradfield et al. (2002) have argued that the influence of postidentification feedback is determined by the strength of internal cues to accuracy relative to the strength of external cues. This is conceptually similar to Festinger's (1954) social comparison

¹ In general, more research support has been found for automatic explanations (see Pohl & Hell, 1996).

theory, which states that when internal cues are weak (i.e., when objective information is not readily available and people are uncertain), people evaluate themselves by looking to the behaviors of similar others. That is, when uncertain, people look to others as sources of information regarding the correctness of their own behavior. Perhaps the provision of feedback in the form of telling witnesses that they have correctly (or incorrectly) identified the perpetrator functions in a manner consistent with the process of social comparison. Memory trace, feelings of familiarity, and ecphoric similarity (the degree of perceived similarity between a stimulus and a person's memory of the stimulus: Tulving, 1981) have been identified as internal cues relevant to the eyewitness identification process (Semmler et al., 2004). To the extent that these cues are weak, eyewitnesses will rely on external, more "objective" information revealed in others' behavior (e.g., postidentification feedback from lineup administrators) to guide them and aid in their understanding of the situation.

The Present Study

Regardless of the underlying mechanism, clear postidentification feedback effects have been observed in numerous studies (e.g., Bradfield et al., 2002; Dixon & Memon, 2005; Semmler et al., 2004; Wells & Bradfield, 1998, 1999; Wells, Olson, et al., 2002, 2003). However, there is much about this phenomenon that remains to be explored. The aim of the current research was to extend the postidentification feedback knowledge base by examining the effect in conjunction with other factors that influence eyewitnesses in their identifications. Specifically, in the current study the effects of method of photo presentation, target presence (or absence), and specific time delays between various phases of the eyewitness identification process were investigated. It is plausible that each

of these factors may moderate the effect of postidentification feedback on eyewitnesses' identification certainty and specific recollections of witnessing the event in question because they may influence the strength of eyewitnesses' internal cues to identification accuracy. In light of the research indicating that jurors often equate confidence with accuracy, any factors found to influence eyewitness confidence merit inquiry.

In the present study, I addressed several questions that have been raised in the eyewitness identification research, and focused particularly on issues revealed in investigations of the effects of postidentification feedback. One question addressed in the current study was determining the specific effects of the two methods of photo presentation (simultaneous or sequential). That is, I investigated which method of photo presentation yields higher accuracy rates and greater susceptibility to influence from postidentification feedback. Another question that was addressed involves the relationship between identification accuracy and susceptibility to influence. More specifically, I investigated the issue of whether accurate (vs. inaccurate) eyewitnesses differ in the degree to which their retrospective reports are susceptible to influence as a result of feedback. A unique contribution of the current study is determining the effects of time delays between various phases of the identification process (i.e., between the witnessing and identification phases, and between the identification and reporting of witnessing experience phases; referred to as the retention and amplification intervals, respectively). Specifically, the questions addressed in the current experiment involved the effects of length and placement of delay on both identification accuracy and susceptibility to influence from postidentification feedback. Many of these research questions were based on the internal cues (social comparison) conceptualization of the

postidentification feedback effect. Convergent evidence from tests of each of these questions may provide useful information regarding the processes underlying the phenomenon.

A 5-factor (2^5) between-subjects factorial design was used to assess the moderating roles of various system and estimator variables on the postidentification feedback effect, as well as their effects on eyewitness identification accuracy. Variables manipulated included retention interval (i.e., delay between viewing the crime and making an identification: 15 min or 1 week), method of lineup presentation (sequential or simultaneous), target presence in the lineup (present or absent), postidentification feedback (confirming or none), and amplification interval (i.e., delay between receiving feedback and providing retrospective reports: 15 min or 1 week). Dependent measures included identification accuracy and responses to an 8-item questionnaire assessing participants' recollections of the crime event and the identification task (modified from Wells & Bradfield, 1999). If participants made an identification from the lineup, a ninth item assessing their willingness to testify regarding the identification was appended to the questionnaire. Inflated responses to these items (8 or 9 items total, depending on whether an identification was made) as a function of feedback comprise what will be referred to in this report as the postidentification feedback effect.

Hypotheses

(1) The cognitive processes involved in making an identification from a photo lineup differ according to the method used to present the photos. Simultaneous lineups lead witnesses to compare multiple photos of suspects to each other (using a relative judgment process), but sequential lineups encourage witnesses to compare one suspect's

photo at a time to their memory of the perpetrator of the crime (using an absolute judgment process: Lindsay et al., 1991). Therefore, consistent with the findings of Steblay and colleagues (Steblay, 2007; Steblay et al., 2001) and current procedural recommendations (Technical Working Group on Eyewitness Evidence, 1999; Wells, Small, et al., 1998), use of the sequential lineup was expected to yield higher overall identification accuracy.

(2) Much eyewitness research has demonstrated the existence of an interaction between method of photo presentation and target presence with respect to identification accuracy (e.g., Lindsay et al., 1991; Steblay, 2007; Steblay et al., 2001). Many studies indicate that simultaneous and sequential lineups may yield relatively comparable identification accuracy rates when the target is present. Sequential (vs. simultaneous) lineups, however, may yield higher identification accuracy rates in target-absent lineups. The differential identification accuracy rates may be attributable to the judgment process encouraged by each type of lineup. Specifically, a relative judgment process may make the identification of a perpetrator easier, whereas an absolute judgment process may make the correct rejection of fillers and innocent suspects easier. Therefore, consistent with the findings of Steblay and colleagues, method of photo presentation was expected to interact with target presence to yield patterns of identification accuracy similar to those outlined above (sequential superiority effect).

(3) As evidenced by rather low eyewitness identification accuracy rates overall (Steblay, 2007; Steblay et al., 2001), eyewitnesses' internal cues to identification accuracy (e.g., memory trace) are generally weak. Because of the weakness of these internal cues, eyewitnesses may rely heavily on external cues (e.g., feedback) to guide

them in making sense of the identification task. Consistent with previous research (e.g., Wells & Bradfield, 1998, 1999), the prediction of Hypothesis 3 was that postidentification feedback would significantly inflate eyewitnesses' reports of their identification decisions. That is, participants were expected to report greater identification certainty, greater ease in making an identification decision, greater clarity of their mental images of the perpetrator of the crime, and greater willingness to testify regarding the identification (if one was made). Additionally, participants were expected to report having had a better view of the perpetrator, being better able to make out the perpetrator's facial features, having paid more attention to features of the perpetrator's face, feeling that they had more information on which to base their identification decision, and needing less time to make the identification. Inflated ratings on these measures were interpreted as evidence for the postidentification feedback effect.

(4) As addressed earlier, sequential photo lineups have been shown to yield higher identification accuracy rates than simultaneous lineups (Steblay, 2007; Steblay et al., 2001). This may be due to the nature of the two lineups. Perhaps, as a function of the task itself, eyewitnesses who view sequential lineups are able to preserve stronger internal cues to identification accuracy than those who view simultaneous lineups. It is possible that the sequential presentation of photos allows for careful discrimination and comparison of each face to the eyewitnesses' memories of the perpetrator's face, whereas the simultaneous presentation of many similar faces overwhelms and interferes with eyewitnesses' memories. If this is the case, then perhaps it is the relatively greater strength of internal cues that remain after a witness views a sequential lineup that contributes to higher accuracy rates of this method (as compared to simultaneous

lineups). The difference in the strength of these internal cues to accuracy could also result in differences in susceptibility to influence from events that occur after the identification task, as stronger memory traces are more resistant to distortion from outcome information than weaker ones (Bradfield et al., 2002; Semmler et al., 2004). The method of photo presentation was therefore expected to significantly affect eyewitnesses' susceptibility to influence from postidentification feedback. Specifically, the prediction of Hypothesis 4 was that participants in sequential conditions were expected to be less influenced by postidentification feedback than those in simultaneous conditions. That is, their reports on the dependent measures assessing the postidentification feedback effect would be less inflated than the reports of participants in simultaneous conditions.

(5) Ideally, eyewitnesses who make a correct identification or nonidentification from a lineup do so because they preserve stronger internal cues to identification accuracy than do eyewitnesses who make incorrect identification decisions. That is, the ecphoric similarity between the perpetrator's face and the eyewitness's mental image of the perpetrator should be greater for eyewitnesses who make correct identification decisions. Presumably, this greater similarity between the memory trace and the external stimulus (i.e., stronger internal cue to identification accuracy) would reduce their reliance on feedback as an external cue by which to guide their inference of internal states (Bradfield et al., 2002). Consistent with Douglass and Steblay (2006), accuracy of identification decision was therefore expected to be significantly related to susceptibility to influence from postidentification feedback. More specifically, the prediction of Hypothesis 5 was that participants who made correct identification decisions (i.e., correct

identifications for target-present lineups, and correct nonidentifications for target-absent lineups) would be less influenced by postidentification feedback than would participants who made incorrect identification decisions (i.e., nonidentifications/incorrect identifications for target-present lineups, and incorrect identifications for target-absent lineups). That is, their responses to the dependent measures assessing the postidentification feedback effect would not be as inflated as those of participants who made incorrect identification decisions.

(6) People's recollections of past events are often imperfect, and the quality of memories can be influenced by the mere passage of time. The degenerative effects of delay between learning and retrieval (retention interval) have been documented in numerous memory studies (e.g., King, Jones, Pearlman, Tishman, & Felix, 2002). Many forensic psychologists (e.g., Shapiro & Penrod, 1986; Wells, Malpass et al., 2000; Wells, Memon et al., 2006) and court rulings (e.g., *Manson v. Brathwaite*, 1977; *Neil v. Biggers*, 1972) have recognized the damaging effects of retention interval with respect to eyewitnesses' ability to make accurate identifications, indicating that, generally, the shorter the period of time between crime and identification task, the greater the likelihood of an accurate identification. Although the mechanisms by which people forget are debatable (e.g., memory decay, interference, faulty retrieval cues, faulty encoding), eyewitnesses' internal cues to identification accuracy (e.g., ecphoric similarity, memory trace) become less reliable as retention interval increases (Ebbeson & Rienick, 1998; King et al., 2002; Wells, Memon, et al., 2006). In light of these premises, the length of retention interval (i.e., delay experienced between viewing the mock crime video and the identification task) was expected to significantly affect eyewitnesses' identification

accuracy. That is, the prediction of Hypothesis 6 was that participants who experienced the 15-min delay would have an overall higher identification accuracy rate than those who experienced the 1-week delay.

(7) Eyewitnesses' internal cues (e.g., memory trace) regarding the crime event can be weakened due to the influence of various estimator variables (e.g., stress, brief exposure time). A longer period of time between viewing the crime event and making an identification allows greater opportunity for the memories regarding the crime event to be influenced by post-event information (Loftus, 1979), and can make the retrieval of these memories more difficult (King et al., 2002; Odnot & Wolters, 2006). As a result, eyewitnesses who experience a longer retention interval are likely to possess rather weak internal cues to identification accuracy and rely more heavily on external feedback to guide their inferences of internal states. Therefore, retention interval was expected to influence participants' susceptibility to influence from postidentification feedback. More specifically, the prediction of Hypothesis 7 was that participants who experienced a 1-week delay would be more influenced by postidentification feedback than those who experienced the 15-min delay.

(8) Low identification accuracy rates (see Steblay et al., 2001) indicate that eyewitnesses' internal cues to identification accuracy (e.g., memory trace) are often weak, or perhaps even inappropriate or nonexistent. Given that witnesses' memories for the crime events themselves may be weak, some researchers have proposed that memories for feedback received regarding identifications are more salient than memories for the witnessing experience itself, perhaps due to a recency effect (Bradfield et al., 2002; Wells, Olson, et al., 2003). Thinking about the explicit feedback received

regarding the identification task may make the memory for that feedback stronger, while the memory of the actual witnessing experience and ambiguous identification task becomes weaker as time passes. As a result, the postidentification feedback effect may be exaggerated for those who are asked to report on certainty (and related measures) after more time has elapsed. Therefore, amplification interval (i.e., delay between making an identification/receiving feedback and reporting on dependent measures) was expected to affect susceptibility to influence from postidentification feedback. More specifically, the prediction of Hypothesis 8 was that participants in the second 1-week delay conditions would be more influenced by postidentification feedback than those in the 15-min conditions.

In addition to these hypotheses, one 3-way interaction of interest was examined in an exploratory fashion. Research to date has yet to examine the interaction of method of photo presentation and target presence in light of the length of retention interval. It may be possible that, due to the degenerative effects of retention interval on memory, a lineup procedure that encourages an absolute judgment (i.e., sequential procedure) would elicit greater accuracy (particularly more correct rejections from a target-absent lineup) after a longer retention interval, whereas a lineup procedure that encourages a relative judgment (simultaneous procedure) would elicit greater accuracy (particularly more correct identifications from a target-present lineup) after shorter retention intervals. Therefore the presence of a three-way interaction of method of photo presentation, target presence, and retention interval was investigated with respect to identification accuracy rates.

CHAPTER 2

METHOD

Design

A 5-factor (2^5) between-subjects design was used. Participants were randomly assigned to one of 32 conditions, which varied with respect to retention interval (15 min or 1 week), method of photo presentation (sequential or simultaneous), target presence in the lineup (target-present or target-absent), postidentification feedback (confirming or none), and amplification interval (15 min or 1 week). Dependent measures included identification accuracy (correct identification, incorrect identification, correct nonidentification, or incorrect nonidentification), and responses to a brief questionnaire that assessed participants' retrospective reports of the witnessing experience and identification task (e.g., identification certainty, quality of view of the crime, willingness to testify regarding identification).

Participants

Data were collected from 164 undergraduate participants² (51.8% male) from the Introduction to Psychology subject pool at the University of Dayton in exchange for experimental credit. Participants ranged in age from 18 to 51 years ($M = 19.26$, $SD =$

² Due to logistic constraints (e.g., limited participant hours available), a power analysis was conducted to determine the number of participants needed to detect the effects of interest. The literature indicates that postidentification feedback, lineup type, and retention interval all have medium to large effect sizes (Wells, Memon, et al., 2006). According to Cohen (1988), 160 is an adequate sample size to detect medium effects ($f = .25$) up to the level of 3-way interactions with power of .80 and alpha set at .05; no higher-order relationships were of interest in this study.

2.683) and 89.6% identified themselves as White. Full descriptive statistics regarding the demographics of the sample can be found in Table 1.

Materials

Stimulus event. Participants viewed a 20 s color video excerpt depicting a mock crime. The video featured a young Black man apparently attempting to break into a car. No crime was actually committed; the actors in the video volunteered their time and the use of their property to help with this research. At the beginning of the video, the camera focused on a birthday barbeque until one of the actors yelled that someone was trying to break into one of the guests' cars. At the 8 s mark, the camera then panned right and zoomed in to focus on the would-be car thief's face. The car thief's face remained in view for approximately 3 s before he ran down the driveway and out of view of the camera. After the video was filmed, the actor's picture was taken for use in the lineups.

Lineups. The photo lineups consisted of six color pictures showing a frontal view of each suspect from the neck up. To construct the lineups, photos of six individuals who are similar in appearance to the perpetrator (specifically, male, approximately 18 – 25 years of age, with dark skin tone and short- to medium-length black hair) were obtained from a website that hosts an archive of law enforcement mugshots available in the public domain (www.mugshots.com). To ensure that these individuals were similar enough in appearance to the perpetrator to be used in the lineups, a manipulation check was conducted, in which individuals were shown the mock crime video and asked to make an identification from either a target-present sequential or target-present simultaneous lineup. An overall identification rate of 36% was obtained (25% in sequential lineups and 43% in simultaneous lineups). Because these volunteers were able to correctly

Table 1

Descriptive Statistics Regarding Demographics of Sample

Characteristic	Frequency	Percent
Sex		
Male	85	51.8
Female	79	48.2
Race		
White	147	89.6
Black	10	6.1
Asian-American	1	.6
Latino/a	1	.6
Other	4	2.4
No Response	1	.6
Year in school		
First	86	52.4
Second	54	32.9
Third	12	7.3
Fourth	11	6.7
Fifth and beyond	1	.6

Note. Participants' ages ranged from 18 – 51, $M = 19.26$, $SD = 2.68$.

identify the perpetrator at rates similar to those obtained in other eyewitness identification studies (e.g., Steblay, 2007; Steblay et al., 2001), it was concluded that the individuals in the photos were appropriately similar to the perpetrator in appearance.

These six photos were presented either sequentially or simultaneously via computer. In the sequential conditions, each photo was presented one at a time. The question “Is this the perpetrator?” appeared above the photo, and two buttons (“Yes” and “No”) appeared underneath it. Participants who viewed sequential lineups provided an identification response by clicking one of the two buttons (i.e., clicking “Yes” indicated the participant believed the individual shown was the car thief from the video, whereas clicking “No” indicated the participant believed the individual shown was not the car thief). If participants clicked “No,” they were shown the next photo; if they clicked “Yes,” the identification task was stopped. Clicking “No” to all photos indicated that the participant rejected the lineup as including the perpetrator. In the simultaneous conditions, the same six photos were shown, but they were presented all at once, in two rows of three. Participants who viewed simultaneous lineups provided an identification response by clicking on the picture of the individual they believed appeared in the video. If participants did not believe the perpetrator was present, they had the option of clicking a “Perp Not Present” button.

Target presence in the lineups was also manipulated. In target-present lineups, the photo of the perpetrator of the “crime” was included in the lineups. The position of this photo in the lineups was randomized to control for any effects of target position. In target-absent lineups, the perpetrator’s photo was replaced with the photo of a filler of similar appearance. The positions of filler photos were not randomized.

Procedure

All stimulus materials were presented via computer (1024 × 768 pixels) except Informed Consent and Debriefing. Participants were seen individually in the experimental sessions and, upon entering the laboratory, were given an Informed Consent sheet to read and sign. This sheet explained that they would be asked to play the role of an “eyewitness” to a crime, make an identification of the perpetrator from a photo lineup, and lastly, respond to a brief questionnaire assessing their perceptions of the crime and identification task. Upon granting consent, each participant began the session by providing demographic information on the computer (Appendix A). When participants completed the demographic survey, the video of the mock crime played.

After viewing the video of the crime, participants experienced one of two retention interval conditions. Some participants were asked to solve word puzzles (see Appendix B for examples: Davis & Bakowski, under review) as a distracter task for 15 min (to prevent mental rehearsal of the crime) and record their answers on an answer sheet that was provided; the others were asked to return to the lab after 1 week.

Following the interval, each participant received identification instructions specific to the lineup presented (sequential or simultaneous), and was not be able to continue until the “Continue” button beneath the instructions was clicked. Participants in sequential conditions viewed the following instructions on the computer screen:

You will be shown a series of photos one at a time. For each photo, please indicate whether the individual shown is the perpetrator or not. You will see each photo only once; you will not be permitted to go back and view earlier photos. If

you indicate “Yes” to any photo, the identification phase will stop and you will not be shown additional photos.

Participants in simultaneous conditions viewed the following instructions: “Please look at the following photos. If you see the perpetrator’s photo, click the corresponding button. If you do not see the perpetrator’s photo, click the ‘Perp Not Present’ button.”

After viewing these instructions, participants were presented with up to six photos (320×400 pixels) of suspects via the computer, with the opportunity to identify the perpetrator. They viewed one of four lineups, which varied with respect to two variables: method of photo presentation (sequential or simultaneous) and target presence (target-present or target-absent). From these photos, participants were asked to indicate which of the suspects, if any, they believed appeared in the video. They made their selections via the indication methods outlined above.

When this phase of the experiment was complete, half of the participants were given confirming feedback regarding their identification decision (i.e., “Good, you identified the suspect!” or “Good, you correctly recognized that the suspect was not present!”) via text appearing on the computer screen with a “Continue” button beneath it. Participants were not allowed to continue with the experiment until they clicked this button. The feedback provided was dependent on the nature of the participants’ decisions (identification vs. nonidentification) rather than on the accuracy of their identifications. Participants in the no-feedback conditions did not receive any feedback regarding their identifications. Regardless of feedback condition, participants then experienced one of two amplification intervals. Some participants completed word puzzles for 15 min, and the others were asked to return to the lab 1 week later. Following this second interval, all

participants were asked to complete a brief questionnaire containing the dependent measures as the last part of the experiment (see Appendix C). Participants were given a written partial debriefing upon the conclusion of their participation. A full debriefing detailing the purpose of the research was provided to all participants via email when the data collection phase of the study was completed (see Appendix D for screenshots of the procedure).

CHAPTER 3

RESULTS

Preliminary Analyses

Identification rates. The target's position in both the sequential and simultaneous lineups was randomized and Chi Square analyses revealed no significant effect of target position on identification accuracy or filler identification rates for either lineup procedure, $\chi^2s < 1.00, ps > .05$. Table 2 displays identification accuracy rates as a function of method of photo presentation, target presence, and retention interval. The overall accuracy rate was 48.2% (correct identifications and correct rejections). Although low, this accuracy rate is rather consistent with accuracy rates reported in other studies (e.g., Steblay, 2007; Steblay et al., 2001). An additional Chi Square analysis revealed that participants were significantly more likely to reject a lineup (63.4%) than to make a positive identification (36.6%), $\chi^2 (1, N = 164) = 11.805, p = .001$.

Postidentification measures. Participants' ratings of the ease with which they made an identification decision (item 6) and the time it took for them to make a decision (item 7) were reverse-scored. Bivariate correlations were computed among participants' responses for the first eight items (see Table 3). All items were significantly and positively correlated with each other (all $rs > .247, ps < .001$) using Holm's sequential Bonferroni procedure to control for Type I error; responses to these items were also sufficiently reliable (Cronbach's $\alpha = .89$). Ratings on these eight items were then averaged to form a composite measure of participants' postidentification ratings, which

Table 2

Identification Responses as a Function of Method of Photo Presentation, Target Presence, and Retention Interval

Identification response: Target-present lineup									
Predictor	Correct ID		Incorrect ID		Incorrect Rejection		Total		
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	
Method of Photo Presentation									
Sequential	6	14.6	9	21.9	26	63.4	41		
Simultaneous	14	33.4	9	21.4	19	45.2	42		
Retention Interval									
15 min	11	27.5	9	22.5	20	50.0	40		
1 week	9	20.9	9	20.9	25	58.2	43		
Overall	20	24.1	18	21.7	45	54.2	83		
Identification response: Target-absent lineup									
Predictor	Correct rejection		False ID		Total				
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	
Method of Photo Presentation									
Sequential	31	77.5	9	22.5	40				
Simultaneous	28	68.3	13	31.7	41				
Retention Interval									
15 min	30	75.0	10	25.0	40				
1 week	29	70.7	12	29.3	41				
Overall	59	72.8	22	27.2	81				

Note. *N* = 164.

Table 3

Bivariate Correlations Among Postidentification Questionnaire Items

	ID	QV	F	A	I	E	T	CI	WT
ID certainty (ID)	—								
Quality of View (QV)	.57	—							
Features (F)	.53	.54	—						
Attention (A)	.49	.45	.50	—					
Information (I)	.70	.56	.63	.51	—				
Ease of ID (E)	.62	.42	.55	.36	.58	—			
Time (T)	.52	.32	.25	.40	.43	.49	—		
Clarity of Image (CI)	.58	.47	.41	.46	.67	.47	.44	—	
Willingness to Testify (WT)	.69	.58	.64	.59	.73	.54	.45	.65	—
<i>n</i> = 60									

Note. Items assessing Ease of ID (E) and Time to make ID (T) were reverse-scored. All participants ($N = 164$) responded to the first eight items. Only participants who made a positive identification ($n = 60$) reported their Willingness to Testify (WT). All *rs* are significant using Holm's sequential Bonferroni procedure to control for Type I error, $ps < .001$.

was used as a dependent variable in the analyses discussed below³. The ninth item assessing participants' willingness to testify regarding the identification was analyzed separately due to differences in sample size; this item was also significantly and positively correlated with each of the other items ($r_s > .441, p_s < .001$) using Holm's sequential Bonferroni procedure (Table 3) and was used as an additional dependent variable in the analyses below.

Hypothesis 1

Method of photo presentation was expected to affect participants' identification accuracy. More specifically, sequential lineups were expected to yield higher overall identification accuracy rates (i.e., correct identifications and correct rejections) than simultaneous lineups. Method of photo presentation was entered into a binary logistic regression analysis (along with the main and interactive effects of target presence and retention interval, which are reported under the appropriate hypotheses below), but was not found to be a significant predictor of identification accuracy, odds ratio = .406, $p = .21$. There was no significant difference in accuracy rates for sequential (45.7%) and simultaneous lineups (50.6%).

Hypothesis 2

Method of photo presentation was expected to interact with target presence to affect identification accuracy. Specifically, simultaneous target-present lineups were expected to yield comparable identification accuracy rates to sequential target-present lineups, but sequential target-absent lineups were expected to yield higher identification accuracy rates than simultaneous target-absent lineups. A binary logistic regression

³ The tests of hypotheses below were also conducted with each item of the postidentification questionnaire as a dependent variable. Conducting the analyses in this manner yielded the same patterns of results. Therefore, only the results of tests using the composite measure as a dependent variable will be reported.

analysis⁴ revealed that target-presence significantly predicted accuracy, odds ratio = 4.333, $p = .03$; participants were more likely to correctly reject a target-absent lineup (72.8%) than correctly identify the perpetrator from a target-present lineup (24.1%).

However, the predicted two-way interaction between method of photo presentation and target presence did not reach significance, odds ratio = 5.538, $p = .108$.

Hypothesis 3

Confirming feedback was expected to inflate eyewitnesses' reports of identification certainty and influence their recollections of various aspects of the identification task (e.g., greater ease in making an identification, greater willingness to testify on the basis of the identification). ANOVAs revealed significant main effects of feedback on both the composite postidentification measure, $F(1, 132) = 36.896$, $p < .00000001$, partial $\eta^2 = .218$, and on willingness to testify, $F(1, 32) = 8.864$, $p = .006$, partial $\eta^2 = .217$. As predicted, participants who received confirming postidentification feedback, on average, provided more inflated retrospective reports ($M = 4.09$, $SD = 1.06$) and greater willingness to testify ($M = 4.03$, $SD = 1.64$) than those who did not receive feedback ($M = 3.05$, $SD = .99$, and $M = 2.39$, $SD = 1.71$, see Table 4)

Hypothesis 4

Method of photo presentation was expected to significantly affect eyewitnesses' susceptibility to influence from postidentification feedback. Specifically, participants in sequential conditions were expected to be less influenced by postidentification feedback than those in simultaneous conditions (i.e., their reports on the dependent measures

⁴ Accuracy rates for both target-present and target-absent lineups tend to be near 50% (Stebly et al., 2001). As a result, binary logistic regression is one appropriate procedure to detect main and interactive effects of the variables of interest on the dichotomous outcome variable of accuracy of identification decision (e.g., Perfect, Hunt, & Harris, 2002). Additionally, many psycholegal researchers have called for increased use of such regression tests when examining eyewitness identification accuracy (e.g., Ross & Malpass, 2008).

Table 4

Mean Postidentification Ratings

Postidentification Rating								
Predictor (Hyp. #)	Composite Measure				Willingness to Testify			
	Feedback		None		Feedback		None	
	<i>n</i>	<i>M (SD)</i>	<i>n</i>	<i>M (SD)</i>	<i>n</i>	<i>M (SD)</i>	<i>n</i>	<i>M (SD)</i>
Retention Interval (7)								
15 min	40	4.02 (1.08)	40	3.12 (1.07)	17	4.33 (1.09)	13	3.46 (1.48)
1 week	42	4.16 (1.05)	42	2.98 (.92)	15	4.60 (.94)	15	2.91 (.75)
Photo Presentation (2)								
Sequential	41	3.99 (1.04)	40	3.02 (1.09)	12	4.22 (1.10)	12	3.47 (1.34)
Simultaneous	41	4.20 (1.09)	42	3.08 (.91)	20	4.60 (.96)	16	2.94 (.99)
Amplification Interval (8)								
15 min	41	4.13 (.98)	40	3.11 (.97)	19	4.54 (.79)	11	3.47 (1.09)
1 week	41	4.06 (1.15)	42	2.98 (1.02)	13	4.34 (1.30)	17	2.97 (1.20)
ID Accuracy (5)								
Correct	42	4.14 (1.00)	37	3.20 (1.15)	11	4.73 (.63)	9	3.88 (1.41)
Incorrect	40	4.04 (1.03)	45	2.93 (.84)	21	4.32 (1.15)	19	2.83 (.88)
Overall (3)	82	4.09 (1.06)	82	3.05 (.99)	32	4.03 (1.64)	28	2.39 (1.71)

Note. Ratings were made on 7-pt scales. All differences in means between feedback and no feedback groups are significant, $p < .001$. No other differences are significant.

would be less inflated than the reports of those in simultaneous conditions). ANOVAs did not reveal significant interactive effects of method of photo presentation and postidentification feedback on either the composite postidentification measure, $F(1, 132) = .212, p = .646$, or willingness to testify, $F(1, 32) = .664, p = .421$. The prediction that participants who viewed sequential (vs. simultaneous) lineups would be less susceptible to influence from feedback was not supported (see Table 4).

Hypothesis 5

Accuracy of identification decision was expected to significantly affect susceptibility to influence from postidentification feedback. More specifically, those participants who made correct identification decisions (i.e., correct identifications for target-present arrays, and correct nonidentifications for target-absent arrays) were expected to be less influenced by postidentification feedback than participants who made incorrect identification decisions (i.e., incorrect identifications/nonidentifications for target-present arrays, and incorrect identifications for target-absent arrays). Consistent with the tests of Hypothesis 3, two-way ANOVAs revealed significant inflating effects of feedback on both the composite postidentification measure, $F(1, 160) = 40.889, p = .000000002$, partial $\eta^2 = .204$, and willingness to testify⁵, $F(1, 34) = 7.675, p = .009$, partial $\eta^2 = .184$. However, neither identification accuracy (correct vs. incorrect), nor the interaction between accuracy and postidentification feedback had a significant effect on either the composite measure or willingness to testify, all F s $< 3.4, p$ s $> .05$. The prediction that participants who made correct identification decisions would be less

⁵ The item assessing participants' willingness to testify was presented only to participants who made an identification. Because the correct decision for target-absent conditions was a rejection of the lineup, all responses to this item in target-absent conditions were from inaccurate participants. Therefore, only responses from participants in target-present conditions were analyzed to explore the main and interactive effects of identification accuracy and feedback on willingness to testify.

influenced by postidentification feedback than those who made incorrect decisions was not supported (see Table 4).

Hypothesis 6

The length of delay experienced between viewing the mock crime video and the identification task (i.e., the retention interval) was expected to significantly affect eyewitnesses' identification accuracy. That is, participants who experienced a 15-min retention interval were expected to have an overall higher identification accuracy rate (i.e., higher overall percentage of correct identifications and correct rejections) than those who experienced a 1-week retention interval. A binary logistic regression revealed that retention interval was not a significant predictor of identification accuracy, odds ratio = .542, $p = .37$. Participants who experienced a 15-min retention interval (51.3%) were not significantly more likely to be accurate than those who experienced a 1-week retention interval (45.2%).

Hypothesis 7

The length of retention interval (i.e., the delay between viewing the crime video and making an identification from a photo array) was expected to influence participants' susceptibility to influence from postidentification feedback. More specifically, participants who experienced a 15-min retention interval were expected to be less influenced by postidentification feedback than those who experienced the 1-week retention interval. ANOVAs did not reveal significant interactive effects of retention interval and postidentification feedback on either the composite postidentification measure, $F(1, 132) = .615, p = .434$, or willingness to testify, $F(1, 32) = .988, p = .328$. Although the expected trend was observed, the prediction that participants who

experienced a longer retention interval would be more susceptible to influence from feedback not was supported (see Table 4).

Hypothesis 8

The postidentification feedback effect may be exaggerated for those who are asked to report on certainty (and related measures) after more time has elapsed. Therefore, amplification interval (i.e., the time between the identification task/provision of feedback and participants' completion of the postidentification questionnaire) was expected to affect susceptibility to influence from postidentification feedback. More specifically, participants who experienced a 1-week delay were expected to exhibit a greater effect of postidentification feedback than those who experienced a 15-min delay. ANOVAs did not reveal significant interactive effects of amplification interval and postidentification feedback on either the composite postidentification measure, $F(1, 132) = .035, p = .853$, or willingness to testify, $F(1, 32) = .003, p = .959$. The prediction that participants who experienced a longer amplification interval would be more susceptible to influence from feedback not was supported (see Table 4).

Exploratory Hypothesis and Additional Analyses

To test Hypotheses 1, 2, and 6, the main and interactive effects of method of photo presentation, target presence, and retention interval were entered into a binary logistic regression analysis as predictors of identification accuracy. Neither the three-way interaction of interest, nor any of the two-way interactions reached significance, odds ratios $< 2.500, ps > .05$. To test Hypotheses 3, 4, 7, and 8, retention interval, method of photo presentation, target presence, feedback, and amplification interval were entered into two ANOVAs with the composite postidentification measure and willingness

to testify as dependent variables. There were no significant interactive effects of any independent variables on either the composite postidentification measure or willingness to testify, $F_s < 2.40$, $p_s > .05$. In addition, no sex differences were found with respect to identification accuracy, retrospective reports, or susceptibility to influence from postidentification feedback.

Method of photo presentation was examined with respect to its effect on participants' willingness to make an identification from a lineup irrespective of accuracy (i.e., choose rates). A Chi Square analysis revealed a marginally significant effect, $\chi^2 (1, N = 164) = 3.338$, $p = .068$. Participants were less likely to make an identification from sequential lineups (26.9%) than simultaneous lineups (43.4%). The sequential lineup procedure is considered superior, particularly with respect to protecting innocent suspects (i.e., correct rejections of target-absent lineups: sequential superiority effect, Wells, Memon et al., 2006). However, an additional Chi Square analysis revealed that the proportions of correct rejections to total lineup rejections for the sequential (.54) and simultaneous (.59) lineups were very similar, failing to reveal a sequential superiority effect, $\chi^2 (1, N = 104) = .238$, $p > .05$.

CHAPTER 4

DISCUSSION

Overview

The purpose of the present study was to investigate the main and interactive effects of numerous system and estimator variables on eyewitnesses' identification accuracy and retrospective reports of the identification task and crime event.

Identification decisions and retrospective reports following the identification task were obtained from each participant and analyzed.

Hypothesis 1

Hypothesis one addressed the expected difference in identification accuracy rates as a function of lineup presentation method. Specifically, consistent with the results of Steblay and colleagues (Steblay, 2007; Steblay et al., 2001), sequential lineups were expected to yield higher overall identification accuracy than simultaneous lineups. In the present study, however, lineup type was not found to be a significant predictor of accuracy of identification decision. The reason for this is not quite clear. Although a manipulation check was conducted, one possible explanation is that the fillers used in the lineups were too similar in appearance to the perpetrator shown in the video and to each other as compared to those used in other similar studies (or in real-world lineups). This might have made correct identifications of the perpetrator difficult overall, regardless of photo presentation method.

One other possible explanation for the low overall accuracy rates (particularly correct identifications) observed in the present study and the similar accuracy rates for sequential and simultaneous lineups may be that participants were not able to fully encode the perpetrator's face from the video. Laboratory eyewitness studies are limited in one sense because crime simulations do not entail the same degree of personal arousal or stress that individuals are likely to experience in real-world crime situations (McQuiston & Malpass, 2002; Morgan et al., 2004). Because high stress has been shown to adversely affect eyewitness memory and identification performance via faulty encoding of the crime event (Deffenbacher, Bornstein, Penrod, & McGorty, 2004), the crime video used in the present study was created in an attempt to simulate this impaired encoding (see Semmler & Brewer, 2006; Weber & Brewer, 2004) while still maintaining a basic level of believability (i.e., once spotted, a car thief is not likely to wait around to be seen or recognized). That is, participants were only given a short period of time (approximately 3 s) to encode the perpetrator's face. It is possible that this was an "overcorrection" in that participants' opportunity to properly encode the perpetrator's face in a manner that approximated real-world encoding was too limited, preventing higher rates of correct identifications⁶.

Although the rate of correct identifications in the present study was low (24.1%), it was well above chance level⁷. This identification rate indicates that, even though many participants may not have been able to fully encode the perpetrator's face, they may have

⁶ Indeed, for participants in "no feedback" conditions, responses to item 5 of the postidentification questionnaire (the item assessing the degree to which participants felt they had enough information to make an identification) were low ($M = 2.70$, $SD = 1.22$).

⁷ Theoretically, for a properly-constructed lineup, the chance of an innocent suspect being selected is $1/N \times P$, where N equals the number of lineup members and P equals the proportion of eyewitnesses who make an identification; a suspect who is identified at a rate higher than this chance level is considered more likely to be the perpetrator in question (Levi & Lindsay, 2001). In the present study, the chance level identification rate from target-present lineups was $1/6 \times .458 = 7.6\%$.

encoded enough information to make an “educated guess” during the identification task. By encoding certain aspects or features of the perpetrator’s face, participants may have been able to rule out some lineup members rather easily, but not others (which is still possible, even in properly-constructed lineups: Penrod, 2006, 2007). As a result, regardless of the type of judgment predicted to be encouraged, (i.e., absolute judgments for sequential lineups and relative judgments for simultaneous lineups) participants may have relied on guessing (from a smaller number of lineup faces, or smaller *functional size* of the lineup: Wells, Leippe, & Ostrom, 1979) when making an identification from either type of lineup. This may account for the low, but similar, correct identification rates yielded by sequential and simultaneous lineups.

Hypothesis 2

Hypothesis two addressed the expected differential accuracy rates of sequential and simultaneous lineups as a function of target-presence (i.e., a two-way interaction predicting identification accuracy: Steblay, 2007; Steblay et al., 2001). More specifically, sequential lineups were expected to yield comparable identification performance to simultaneous lineups in target-present conditions (correct identifications), but superior identification performance in target-absent conditions (i.e., more correct rejections and fewer filler identifications than simultaneous lineups: sequential superiority effect). In the present study, sequential and simultaneous lineups were found to yield comparable rates of correct identifications, but the predicted sequential superiority effect was not found. Instead, target-presence was found to significantly predict lineup performance (i.e., higher accuracy in target-absent conditions).

The restricted opportunity for encoding posited above may also account for the comparable rates of correct rejections in sequential and simultaneous lineups, as well as the difference in accuracy as a function of target presence. Participants were significantly more likely to correctly reject a lineup composed of fillers than to correctly identify the perpetrator from a target-present lineup. Significantly higher overall rates of lineup rejection (63.4%, irrespective of accuracy) may suggest that many participants chose not to identify a particular lineup member because they simply did not feel they had enough information to make an identification (restricted opportunity for encoding: see footnote 6). As a result, when distributed across target-present and target-absent conditions (irrespective of lineup condition), the high rate of lineup rejections may have resulted in the significantly higher rate of correct lineup rejections found in target-absent conditions, whereas rates of correct identifications in target-present conditions remained constant. One potential problem from such an explanation is the possibility that the overall low identification accuracy rate (48.2%) obtained in the present study may actually be inflated, as the majority of correct identification decisions (i.e., correct rejections) may not have resulted from participants' having strong memories of the perpetrator, but rather from having weak memories and no opportunity to make an "I don't know" identification response⁸.

One other possible explanation for the observed choose rates and, as a result, differential accuracy rates as a function of target-presence, may come from the decision criterion encouraged for identification as the result of the pre-lineup instructions. Many

⁸ Although participants were provided with a "Perp Not Present" option, this is qualitatively different from an "I don't know" identification response option. Despite the resulting reduction in interpretability, it is typical in many eyewitness studies to provide participants with the same (or fewer) response options used in the present design (e.g., Wells & Bradfield, 1998, 1999; Lindsay & Wells, 1985).

researchers have suggested that, simply because they are viewing a lineup, eyewitnesses may assume that the perpetrator is in the lineup and that it is their job to pick him or her out (Wells, Small et al., 1998). To reduce this pressure, forensic psychologists have recommended that lineup administrators remind witnesses that the perpetrator “may or may not” be present in the lineup (unbiased lineup instructions); such unbiased lineup instructions have been found to lower overall identification rates (of both the perpetrator and fillers), supposedly by raising the decision criterion for identification (see Clark, 2005; Steblay, 1997). Although the instructions used in the present study did not contain the same exact phrase, participants were informed that a nonidentification was a valid identification decision, perhaps raising their decision criterion and resulting in lower overall choose rates. Additionally, it is possible that participants were skeptical of the perpetrator’s presence in the lineups simply because it was a psychology experiment, a context in which deception has been known to occur. This lower overall choose rate, then, would account for higher rates of correct rejections in target-absent conditions and lower rates of correct identifications in target-present conditions.

The size of the sample used in the present study may provide one more explanation for the non-significant interaction of method of photo presentation and target presence. Identification accuracy rates as a function of method of photo presentation and target presence were found in the predicted pattern, but did not reach significance ($p = .108$). Due to various logistic constraints (e.g., insufficient number of available research participant hours, time constraints), the size of the sample used was reduced from the usual 20 per cell to only 5 per cell (see footnote 1). It is possible that the trends in

identification accuracy as a function of the interaction between these two variables may have reached significance with a larger sample and more power.

Hypothesis 3

Hypothesis three addressed the influence of confirming postidentification feedback on participant eyewitnesses' retrospective reports. The specific prediction of hypothesis three was that confirming feedback would inflate participants' retrospective reports in a manner that indicated that they were more certain of the accuracy of their identification and more confident in their recollections of the crime event (e.g., that they paid more attention while viewing the crime event) and identification task (e.g., that the identification task itself was easier). The results obtained in the current study supported this hypothesis.

The present study yielded feedback effects that are of considerable practical concern. Although such trends were not observed in the current research, some studies have revealed that eyewitness identification certainty can be highly diagnostic of identification accuracy under certain conditions (Brewer & Wells, 2006; Sporer, Penrod, Read, & Cutler, 1995). Results from the present study indicate that additional factors must be considered when making such assessments. In the present study, participants who received confirming postidentification feedback provided inflated retrospective reports of certainty and many other relevant aspects of courtroom testimony that jurors are instructed to consider when weighing eyewitness evidence (*Manson v. Braithwaite*, 1977; *Niel v. Biggers*, 1972). For example, despite having a limited opportunity to encode the perpetrator's face (which may account for low identification accuracy rates), participants who received feedback provided significantly inflated reports regarding their

ability to identify the perpetrator; these artificially inflated reports could have disastrous effects in court.

These findings on the influence of explicit confirming feedback, in combination with the potential influence of myriad other less explicit factors (e.g., charges being filed against the suspect, pre-trial publicity), indicate that eyewitnesses' courtroom expressions of their recollections may be rather unreliable. Considering the influence of confirming feedback on eyewitnesses' willingness to testify regarding the identification, and the weight jurors place on confident witnesses, the current results underscore the necessity of double-blind lineup administration and the assessment of witnesses' certainty at the time of the identification. Such "objective" measures may be used to more accurately communicate eyewitnesses' retrospective reports to jurors.

Hypothesis 4

Hypothesis four addressed the effect of photo presentation method on participants' susceptibility to influence from postidentification feedback. Ideally, higher identification accuracy in sequential (vs. simultaneous) lineups in other eyewitness studies (see Steblay et al., 2001) may indicate that the sequential presentation of lineup photos may allow witnesses to better preserve internal cues to identification accuracy (e.g., ecphoric similarity between memory of the perpetrator and photo of the perpetrator in the lineup). The potential difference in strength of these internal cues was expected to result in differences in susceptibility to postidentification feedback. Specifically, participants who viewed sequential lineups were expected to be less influenced by postidentification feedback than those who viewed simultaneous lineups (i.e., a two-way interaction). Although results from the current study failed to support this hypothesis,

they are consistent with the results from another recent study investigating similar questions (Douglass & McQuiston-Surrett, 2006); in both studies, participants were equally influenced by postidentification feedback regardless of the lineup they viewed.

The hypothesized differential identification accuracy rates as a function of lineup type were not obtained in the present study. One explanation for this, as discussed above, may be that participants were not able to properly encode the perpetrator's face from the crime video (footnote 6). If this was the case, then the majority of participants' internal cues to identification accuracy (e.g., memory trace) may have been weak from the outset. Because the effect of postidentification feedback was predicted to be determined by the strength of these internal cues to identification accuracy, overall weak internal cues may have allowed feedback to have a pronounced effect on all participants in feedback conditions, regardless of the type of lineup viewed.

An additional explanation for the lack of support for the current hypothesis may come from a re-examination of the assumptions of the hypothesis and the cognitive mechanisms underlying eyewitnesses' decisions when viewing sequential and simultaneous lineups. The underlying assumption of the present hypothesis was that, ideally, witnesses who make correct identification decisions from a lineup do so because they preserve strong enough internal cues to identification accuracy. Therefore, it was assumed that higher overall identification accuracy in sequential conditions may be attributed to witnesses' preserving internal cues to identification accuracy better than those in simultaneous conditions because they are not overwhelmed by multiple faces that all look similar to one another. However, an examination of filler identification rates indicates that, in the current study, correct identifications were not necessarily made

under such ideal conditions⁹; therefore, there are likely additional explanations for the differential identification rates between those in the current study and those typically observed in sequential and simultaneous lineups.

Further breakdown of identification accuracy rates typically reported indicate that although sequential lineups yield higher overall identification accuracy than simultaneous lineups, this is due primarily to a higher rate of correct rejections in target-absent conditions rather than correct identifications in target-present conditions (Stebly, 2007; Stebly et al., 2001). Some researchers have suggested that this pattern may be due to a decision-criterion shift in sequential lineups, whereby eyewitnesses who view sequential lineups set their criterion for identification higher than those who view simultaneous lineups (Clark & Davey, 2005; Ebbeson & Flowe, 2001; Gronlund, 2004, 2005; Meissner, Tredoux, Parker, & MacLin, 2005). This raised identification decision criterion is suggested to account for the overall decrease in choose rates (and, sometimes correct identification rates), and the increase in correct rejection rates for sequential lineups reported in other studies. Indeed, the marginally significant effect of lineup type on choose rates in the present study may suggest that such a criterion shift occurred.

Although psychologists, law enforcement officials, and the triers of fact would like to believe that correct identifications are solely the result of eyewitnesses' preserving strong internal cues to accuracy, real-world (and laboratory) identification performance clearly indicates that this ideal is not a reality. The proposed shift in judgment strategy (see Wells, 1993, for a discussion of the removal-without-replacement effect) and

⁹ The rate of filler identification can be divided by the number of fillers to obtain an estimate of the percentage of correct identifications that can be considered "lucky guesses" (Penrod, 2007). The filler identification rate for 6-person, target-present lineups in the present study was 22%, indicating that $.22/5 = 4.4\%$ of correct identifications can be considered due to chance rather than memory for the perpetrator.

decision criterion shifts in sequential lineups may account for the typically observed differences in identification accuracy rates for sequential and simultaneous lineups, and indicate that the present assumption (i.e., that those who view sequential lineups are better able to preserve internal cues to accuracy than those who view simultaneous lineups) may have been inappropriate as the basis for a hypothesis concerning real-world applications of psychological concepts.

Hypothesis 5

Hypothesis five addressed the expected influence of accuracy of identification decision on susceptibility to influence from postidentification feedback. As stated above, in ideal conditions, witnesses who make correct identifications (and nonidentifications) do so because they possess strong memories for the perpetrator. Because research has shown that stronger memories tend to be more resistant to distortions from postevent information (e.g., Loftus, 1979), participants who made correct identification decisions (i.e., correct identifications in target-present conditions or correct nonidentifications in target-absent conditions) were expected to be less influenced by postidentification feedback than participants who made incorrect identification decisions (Douglass & Steblay, 2006). However, this hypothesis did not receive sufficient support.

The underlying assumption for the present hypothesis is similar to that of the previous hypothesis. Although this assumption may not have been an appropriate basis for Hypothesis four, it has been shown to be appropriate with regard to identification accuracy and postidentification feedback (see Bradfield et al., 2002; Douglass & Steblay, 2006). In these studies, inaccurate participants were more influenced by postidentification feedback than accurate participants, which the authors attributed to

differences in the strength of their internal cues to accuracy. The lack of an effect of accuracy of identification decision on susceptibility to influence from postidentification feedback in the current study may therefore be attributed to other factors.

Low overall identification accuracy rates (particularly low correct identification rates) may suggest that most participants were not able to properly encode the perpetrator's face. As a result, many of the correct identifications may have been the result of "educated guesses," as addressed above. If this is the case, then those participants who made correct identifications did not necessarily possess the stronger internal cues to identification accuracy as currently assumed and previously posited by other researchers (e.g., Bradfield et al., 2002); instead, their cues have been rather similar to those of inaccurate participants. Because the effect of postidentification feedback was expected to be determined by the strength of internal cues to accuracy, the similar strength in cues between the two groups may have prevented the observation of this differential effect (particularly among those who made an identification).

In the present study, target presence was a significant predictor of identification accuracy. Specifically, participants were more likely to correctly reject a target-absent lineup than to correctly identify the perpetrator from a target-present lineup. As addressed above, a limited opportunity to encode the perpetrator's face and the lack of an "I don't know" response option may indicate that not all participants who correctly rejected the target-absent lineups necessarily did so because they had good memories of the perpetrator (i.e., had strong internal cues to identification accuracy); perhaps some rejected the lineup because they had poor memories and did not feel confident enough to make an identification decision. The accurate identification decision group, then, may

have included many participants who had strong internal cues to identification accuracy and many who did not, preventing the detection of the hypothesized effect.

These results may also be indicative of the mechanism underlying the postidentification feedback effect. The current hypothesis was based on the “cues” conception of the effect, a process whereby participants weigh the relative strength of internal to external cues to accuracy (similar to social comparison: Festinger, 1954). Differences in the strength of these cues were predicted to determine participants’ susceptibility to influence from feedback. However, accuracy (which is generally a good indicator of the strength of internal cues) did not influence participants’ susceptibility. Because the “cues” hypothesis cannot account for these trends, such results may provide indirect support for the conceptualization of the postidentification feedback effect as a type of hindsight bias (Fischhoff, 1975, 1977). Converging evidence from tests of hypotheses addressed later may provide more support for this interpretation.

Even though the present hypothesis was not supported and the underlying mechanism of the effect is not yet fully understood, the results are of great concern. Identification confidence is one factor that jurors and judges are explicitly instructed to consider when weighing eyewitness evidence (*Manson v. Brathwaite*, 1977; *Neil v. Biggers*, 1972), and research shows that they are heavily influenced by witnesses who provide confident testimony (Brewer & Burke, 2002). One subtle but inherent problem is that usually only highly confident witnesses are placed on the stand to testify (Bradfield & Wells, 2000), which provides jurors with a very restricted range of confidence by which to judge the accuracy of testimony. The issue quickly becomes even more complicated. In the present study, inaccurate participants were just as confident and just

as influenced by postidentification feedback as accurate participants. Although such trends may be attributed in part to factors addressed above, these results (as well as results that indicate that inaccurate witnesses tend to be more influenced by postidentification feedback) suggest that eyewitnesses' appraisals of their memories and identification performance may not be a reliable predictor of accuracy (particularly in instances where feedback is provided). Given the instructions jurors are provided and the conditions under which they are to weigh eyewitness evidence, the issue of eyewitness certainty becomes more troublesome and casts doubt as to how jurors should be instructed to weigh eyewitness testimony.

Hypothesis 6

Hypothesis six addressed the effect of retention interval on identification performance. Numerous studies have revealed that longer retention intervals result in poorer memory performance (e.g., Ebbeson & Rienick, 1998; King et al., 2002; Odinet & Wolters, 2006), and the effects of delay (i.e., intervening events) on identification accuracy are well documented in the forensic literature (see Shapiro & Penrod, 1986, and Wells, Memon, et al., 2006). Consistent with these findings, participants who experienced a 1 week retention interval were expected to perform more poorly on the identification task than those who experienced a 15 min retention interval. In the present study, although the predicted differential accuracy rates were observed, sufficient support for the hypothesis was not obtained.

The size of the sample used in the current design may provide an explanation for why the relationship between retention interval and identification accuracy did not reach significance. Due to various logistic constraints, the size of the sample used was reduced

from the usual 20 per cell to only 5 per cell (see footnote 1). It is possible that the trends in identification accuracy as a function length of retention interval may have reached significance with a larger sample and more power.

The nature of the encoding opportunity in the present design may provide an alternative explanation for why the hypothesized (and well-established) effect was not detected. As discussed above, in an attempt to simulate the quality of encoding that the stress of viewing an actual crime event is likely to encourage, participants were only exposed to the perpetrator for a few seconds (see Semmler & Brewer, 2006; Weber & Brewer, 2004). However, this may have too severely encumbered participants' encoding and resulted in many participants' retaining rather poor memories of the perpetrator. Although overall their memories may have been poorer than expected, participants may have been to encode salient characteristics of the perpetrator that allowed them to effectively reduce the functional lineup size and make an "educated guess" (see discussion of Hypothesis 1), regardless of retention interval experienced.

An examination of overall response trends may provide an additional explanation for the results. As addressed above, participants were significantly more likely to reject a lineup than to make a positive identification, and most correct identification decisions were correct rejections of target-absent lineups (rather than correct identifications of the perpetrator from target-present lineups). It is possible that participants who experienced the 15-min retention interval were more likely to reject target-absent lineups because they preserved better memories for the perpetrator and were able to accurately conclude that he was not present in target-absent arrays. Perhaps those who experienced the 1-week retention interval experienced the predicted degeneration in memory to the point where

they did not feel confident in making an identification decision; their correct rejections, therefore, may have been the result of poor memories (and lucky rejections) rather than good memories of the perpetrator. The predicted relationship between retention interval and identification accuracy may be present in the data, but the absence of an “I don’t know” response option makes further interpretation of these trends difficult.

Hypothesis 7

Hypothesis seven addressed the effect of retention interval on participants’ susceptibility to influence from postidentification feedback. Similar to the rationale for Hypotheses four and five, participants who experienced the longer retention interval of 1 week (and, therefore, were more likely to have weaker memories for the perpetrator’s face at the time of the identification task) were expected to report more inflated retrospective reports of the crime event and identification task as a function of postidentification feedback than those who experienced the 15-min retention interval. However, insufficient support was found for this hypothesis.

One possible explanation for these results may be extrapolated from an explanation for the trends observed in tests of the previous hypothesis. In numerous studies, longer retention intervals have been shown to adversely affect eyewitness identification performance by allowing more time for intervening events to distort eyewitnesses’ memories (e.g., Ebbeson & Rienick, 1998; Loftus, Miller, & Burns, 1978; Shapiro & Penrod, 1986), resulting in weaker internal cues to identification accuracy (Odinot & Walters, 2006; Wells & Loftus, 2003), and presumably increased susceptibility to influence from postidentification feedback. The predicted difference in identification rates as a function of retention interval was observed, but did not reach

significance, perhaps due to insufficient power. Similarly, the average differences in the mean ratings on the composite postidentification measure and willingness to testify as a function of feedback were greater for the 1-week retention interval group than for the 15-min group; however, the interaction did not reach significance, perhaps also due to insufficient power. Although a reduced sample size may have prevented detection of these effects, these trends may indicate that participants in longer retention interval conditions experienced greater degeneration in memory trace (weaker internal cues) resulting in lower identification accuracy (Hypothesis 6) and greater susceptibility to postidentification feedback. However, more data must be collected to verify this possibility

Another interpretation of the current results is that the relationship between the strength of internal cues and susceptibility to influence from postidentification feedback (a process related to social comparison) does not exist. As addressed above, it is very possible that participants in the 1-week retention interval conditions experienced greater memory degeneration than those in the 15-min conditions. However, because participants were not provided with an “I don’t know” identification response option, they may have been more likely to reject the lineups (rather than make an identification when uncertain), which may have inflated identification accuracy rates in target-absent conditions (see Hypothesis 2). This may suggest that identification accuracy was not a reliable indicator of the strength of participants’ internal cues and, indeed, participants in longer retention interval conditions may have had weaker internal cues to accuracy.

If this is assumed, and the “cues” explanation for the postidentification feedback effect is accurate, then, as predicted, the retrospective reports of the participants in the

longer retention interval conditions would still have been more distorted (i.e., inflated) than those in the shorter conditions because their internal cues to accuracy were weaker (despite comparable identification accuracy rates). However, these results were not found; all participants' retrospective reports were equally influenced by feedback regardless of retention interval (i.e., the predicted interaction did not reach significance). Although it is still possible that a small sample size prevented the detection of this effect, these results may more strongly suggest that the process of weighing the relative strength of internal and external cues, which could influence the effect of postidentification feedback, does not actually occur. This may provide indirect support for the conceptualization of the postidentification feedback effect as a type of hindsight bias (Douglass & Steblay, 2006); this is addressed in greater depth below.

Hypothesis 8

Hypothesis eight addressed the effect of amplification interval on participants' susceptibility to influence from postidentification feedback. Some researchers have suggested that, because eyewitnesses' internal cues to accuracy are relatively weak (as evidenced by low identification accuracy rates: Wells et al., 2003), the feedback they receive regarding their identification performance may be more salient than their initial memory trace. As more time passes and memory traces fade, eyewitnesses' memories of the explicit and salient feedback regarding their performance on the ambiguous identification task may have a greater distorting effect on their retrospective reports. Therefore, participants who experienced the longer (1 week) amplification interval were expected to report more inflated retrospective reports as a function of feedback than those who experienced the shorter (15 min) interval. Results did not support this hypothesis;

participants were equally susceptible to influence from postidentification feedback regardless of the length of amplification interval.

Like other hypotheses regarding the influence of postidentification feedback in the present study, the rationale underlying this prediction was based on the “cues” explanation of the postidentification feedback effect. Although the current hypothesis was not supported, the results may provide some valuable information regarding the mechanisms that underlie this effect. Wells and colleagues (Bradfield et al., 2002; Wells et al., 2003) suggested that the effect of postidentification feedback may depend on the relative strength of eyewitnesses’ internal to external cues to accuracy, a weighing process similar to social comparison (Festinger, 1954); they posited that explicit postidentification feedback (an external cue) remains salient in the eyewitnesses’ memory, whereas memory for the crime event and ambiguous identification task weakens. If so, then the relative strength of this external cue to internal cues would increase as time passes (i.e., with a longer amplification interval), resulting in a more pronounced effect of postidentification feedback. However, these trends were not observed in the present study.

Although the “cues” hypothesis cannot be used to effectively account for these results, the conceptualization of the postidentification feedback effect as a manifestation of the automatic hindsight bias (Fischhoff, 1975, 1977) accounts for these trends (and those observed in tests of other hypotheses) relatively well. Much research on the mechanisms underlying the hindsight bias indicates that outcome information immediately and drastically distorts participants’ judgments of the past (e.g., Pohl & Hell, 1996). Bradfield and Wells (2005) suggested this effect is elicited because participants

are not likely to consider their judgments prior to being asked to do so. Because they are asked to provide retrospective judgments after being provided outcome information, the only way participants can consider these judgments is through the lens of the outcome information. This lens distorts their memories to make them consistent with newly acquired information. In the present design, participants were provided with outcome information immediately after making an identification (i.e., postidentification feedback). Using this conceptualization of the hindsight bias, all subsequent retrospective judgments (whether after 15 min or 1 week) would have been equally tainted by outcome information. For example, when asked to rate how much attention they paid during the crime task, regardless of how much time had passed, participants may have been equally likely to make a quick assessment like, "I must have paid close attention to the perpetrator's face because I made the correct identification decision." Indeed, that is what was found in the present study. Participants' retrospective reports were equally distorted by postidentification feedback, regardless of the length of the amplification interval. Similarly, these comparable results were also obtained regardless of accuracy of identification (Hypothesis 5), length of retention interval (Hypothesis 7), and type of lineup viewed (Hypothesis 4), all of which can be accounted for by conceptualizing the postidentification feedback effect as a type of hindsight bias.

Although the automatic mechanism may account for the results, motivational mechanisms may also provide an additional explanation. Motivational conceptions of the hindsight bias indicate that participants distort their memories to make them more consistent with the outcome information so as to portray themselves more favorably (Bradfield & Wells, 2005). It is possible that participants consciously incorporated this

outcome information (i.e., confirming postidentification feedback) when providing retrospective reports so as to make themselves appear to be more credible and reliable witnesses (or better research participants). Because the results of this process are not dependent on the length of time between the provision of outcome information and the making of these judgments (or on identification accuracy or any of the other factors manipulated), participants' retrospective reports in both amplification interval conditions would be expected to be comparable; such results were obtained.

More generally, if the motivational explanation of the hindsight bias accurately describes the process at work in this study, the results may provide some additional information. According to one conception of motivation, people will be likely to make internal attributions of success when a successful outcome is achieved in the presence of external barriers. This process whereby people maximize positive impressions is called augmentation (Kelly, 1973). To take the opportunity for augmentation, people will likely emphasize the external barrier to success (Bradfield & Wells, 2005). Applied to the current study, in order to engage in augmentation, participants who received confirming feedback may have reported inflated certainty and ease of identification, but indicated that they had much less information with which to make an identification decision. Doing so, participants would have shown that, *despite* the external barriers to success, they still managed to make the right identification decision, which portrays them in a positive light (i.e., as excellent observers). However, in the present study, all postidentification measures were significantly and positively correlated with each other. That is, as ratings of retrospective identification certainty increased, so did ratings on all other measures, including those variables that *facilitated* their judgments (e.g., good view

of perpetrator, good basis for identification). Such trends indicate that participants did not take the opportunity to engage in augmentation and may suggest that the process of augmentation is more situation-specific than originally proposed. Perhaps only certain situations lend themselves to emphasizing external barriers to success as a positive impression-formation strategy. That is, in some situations (e.g., a crime event) individuals may achieve the desired impression (e.g., being viewed as credible) by *downplaying* any external barriers.

Exploratory Hypothesis

In addition to the above hypotheses, one three-way interaction was of interest in the present study. A photo presentation method \times target presence \times retention interval interaction was examined with respect to its influence on identification accuracy. It may be possible that, due to the degenerative effects of retention interval on memory, a lineup procedure that encourages an absolute judgment (i.e., sequential procedure) would elicit greater accuracy (particularly more correct rejections from a target-absent lineup) after a longer retention interval, whereas a lineup procedure that encourages a relative judgment (simultaneous procedure) would elicit greater accuracy (particularly more correct identifications from a target-present lineup) after shorter retention intervals. However, the interaction did not reach significance. Potential explanations of the previous hypotheses addressed earlier in this report may account for these results (e.g., limited encoding opportunity, “educated guess” strategy, lack of an “I don’t know” response option). Another possibility is that such an interaction simply does not exist, and that, in the real-world as well as in the present study, the effects of lineup type and other system

variables (e.g., lineup instructions, filler selection, lineup administration) exert a greater influence on eyewitnesses' decisions (for better or worse).

Limitations of the Present Study

The present study provides much information regarding the nature of the effects of numerous system and estimator variables on eyewitness identification accuracy and the postidentification feedback effect. However, there are a few aspects of the design that limit the extent to which these results may be interpreted and generalized.

Inferential statistics in the present study did not reveal an effect of lineup type (or a two-way interaction of lineup and target presence) on identification accuracy. Despite similar accuracy rates, a marginally significant effect of lineup type on choose rates may indicate that identification decisions from the sequential lineup may have been more diagnostic of accuracy than identifications from the simultaneous lineup¹⁰. That is, theoretically, correct identifications and correct rejections from sequential lineups may provide more information about the quality of eyewitnesses' memories (and, as a result, probability of guilt/innocence of a suspect in question) than the same decisions from simultaneous lineups; specifically, the diagnosticity ratios for identifications and nonidentifications from sequential lineups may be higher than those from simultaneous lineups. However, calculating these ratios requires the *a priori* designation of an innocent suspect in target-absent conditions; due to programming constraints, this was not done, making it impossible to compute diagnosticity ratios for the present study. As a result, fuller interpretation of identification accuracy rates is prevented.

¹⁰ See Wells & Lindsay (1980) for a more complete discussion of diagnosticity ratios and information gain in eyewitness identification.

The identification response options provided to participants are another limitation of the present study. Like many other eyewitness identification studies, participants were not provided with an “I don’t know” response option during the identification task, particularly because a very small percentage of real-world eyewitnesses provide such a response when viewing a lineup (Behrman & Richards, 2005; Wright & McDaid, 1996; Wright & Skagerberg, 2007). However, the absence of such a response option has the potential to inflate accuracy rates in target-absent lineups, particularly in situations in which the eyewitness was not able to fully encode the perpetrator’s face. If, in the present study, there was a substantial number of participants who would have otherwise opted to *not* make an identification decision (i.e., to say that they were not sure if the perpetrator was in the lineup or not), then much information gained from identification accuracy rates would be suspect. Although these trends would still provide some information that could be applied to real-world identification procedures (e.g., situations in which witnesses feel pressured to give yes/no rather than “I don’t know” responses), deeper analysis would be prevented. It should be noted, however, that the primary aim of eyewitness research is not to show estimates of actual misidentification rates, but cause-effect relationships among variables that may be at work in the real world (Wells & Lawson, 2007); the present study was successful in this regard.

An additional limitation of the present study concerns the nature of the postidentification feedback. The present study was conducted to investigate numerous potential moderators of the postidentification feedback effect. For this reason, extreme measures were taken to ensure that the only factor to which distortions in retrospective reports could be attributed was the outcome information. That is, participants’ inflated

reports could only be attributed to their knowledge that they made the correct identification decision, rather than a combination of other factors (e.g., lineup administrator's behavior or tone of voice). As a result, the feedback provided to participants via text on a computer screen was not necessarily comparable to the types of postidentification feedback real-world eyewitnesses may be likely to receive (e.g., a smile, a sigh, or in some cases, applause). Although the presentation of feedback in this manner was appropriate for the purposes of the study, it may perhaps limit the immediate generalizability of the results¹¹.

One additional limitation of the study concerns the small sample used. The nature of applied (particularly eyewitness identification) research is such that at any time there are nearly innumerable external factors that exert main and interactive effects on the process of interest. Because of this, the variance accounted for by a given factor may be significant, but rather small when considered in the context of the other forces at work (Cutler, Penrod, & Stuve, 1988). Due to logistic constraints, the size of the present sample was reduced to detect only the interactions of interest (i.e., two- and three-way); however, it is possible that the effect sizes of these interactions were smaller than anticipated (see footnote 1), particularly in the context of a five-way factorial design. As a result, the predicted effects may have either been present, but remained undetected, or truly not existed. The low power observed in some of the analyses makes stronger interpretation of the results difficult.

¹¹ However, the fact that such strongly significant effects were found using extremely contrived feedback may make the results more alarming. Perhaps more natural forms of feedback (e.g., an excited officer saying "Great job! We got 'em!") may have more pronounced effects on the confidence of a witness who is emotionally involved in the identification task.

Implications and Suggestions for Future Research

Although there are limitations to the present study, the results do have some noteworthy implications, particularly with respect to the nature of the postidentification feedback effect. All hypotheses concerning the moderated influence of postidentification feedback on participants' retrospective reports were based on the "cues" hypothesis that the postidentification feedback effect is elicited to the degree that the external cues to identification accuracy (i.e., feedback) are stronger than internal cues (i.e., memory trace: Bradfield et al., 2002). However, none of the hypotheses regarding these moderator variables was supported; participants were equally influenced by postidentification feedback regardless of the levels of any other factors. Although alternative explanations could be provided for the results of each hypothesis, when considered together, the results may suggest that the underlying mechanism of the postidentification feedback effect is not characterized by a process of weighing the relative strength of internal and external cues (similar to social comparison processes), but perhaps the mechanism is more closely linked to the hindsight bias.

The results reported here may lend support to automatic conceptualizations of the hindsight bias; however, motivational processes may be at work as well. Future research should be focused on determining which conceptualization of the hindsight bias (i.e., automatic and/or motivational) underlies the postidentification feedback effect, and the conditions under which augmentation and motivational processing occur. Further, an understanding of the cognitive mechanism responsible for the effect could lead to other investigations of how to inoculate eyewitnesses against influence from such feedback. For example, if automatic processes are responsible for the effect, measures could be

taken to preserve eyewitnesses' retrospective reports on a variety of forensically relevant variables prior to the provision of feedback, or even prior to the identification task itself (see Bradfield & Wells, 2005; Wells & Bradfield, 1999). If motivational processes are found to underlie the effect, then such findings might have implications for explicit instructions that should be provided to eyewitnesses prior to the provision of retrospective reports of identification certainty, or perhaps at the start of the initial interview phase that follows the crime event.

Virtually all research on the influence of social factors (particularly administrator biases) at the time of the identification task on eyewitness confidence leads to the same conclusions: double-blind lineups should always be used, and identification confidence should be assessed immediately following the identification task before any feedback is provided (Douglass & Steblay, 2006; Wells, Memon, et al., 2006). The implications of the present study are consistent with these recommendations. These procedures ensure eyewitnesses' initial and unbiased reports of certainty can be preserved for use in court. However, problems may still exist further along the criminal justice process. Even if eyewitnesses' ratings of certainty are obtained, it is still possible for witnesses' retrospective reports of certainty to become distorted by a variety of factors after the identification task (e.g., charges filed against the person they identified, pre-trial publicity). In such cases, eyewitnesses' testimony in court regarding their identification certainty may not be consistent with the "objective" record of certainty obtained at the time of the identification. Jurors may be faced with weighing an abstract rating of identification certainty obtained months (or years) prior against a highly confident and passionate eyewitness providing testimony in the present. Future research may be

focused on determining which of these reports of certainty is more likely to influence jurors' decisions. Additionally, the proper way to ensure that jurors are able to evaluate the facts of the case and the reliability of the testimony without being unduly influenced by extralegal factors should also be investigated (e.g., via expert testimony, juror education programs).

Summary and Concluding Comments

In conclusion, the findings of this research contribute to the existing literature in several ways. First, the results revealed that the postidentification feedback effect is robust and may not be moderated by numerous system and estimator variables. Such findings provide additional support for recommendations for double-blind lineup administration. Second, converging evidence from multiple hypotheses provided information regarding the underlying mechanism of the postidentification feedback effect, suggesting that the "cues" explanation for the effect may not be appropriate. Rather, the underlying mechanism for the effect may be more conceptually related to the hindsight bias. Additionally, if motivational processes are found to be at work, the present results may suggest that certain mechanisms of impression-formation (i.e., augmentation) thought to underlie the motivational conceptions of the hindsight bias may be more situation-specific than originally proposed.

Third, no relationship was found between identification accuracy and retrospective identification certainty (or ratings on other forensically relevant variables). These results further indicate that jurors and investigators should use caution when using eyewitness confidence to postdict identification accuracy and evaluate testimony. Finally, although direct support was not found for all hypotheses, the questions raised by

this study provide fertile ground for further research on eyewitness identification procedures and juror decision making. Results from such investigations can then be used to effect positive change in the criminal justice system.

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APPENDIX A:
Demographics Questionnaire

Sex: _____ Male _____ Female

Age: _____

Year in School: _____ First Year
 _____ Second Year
 _____ Third Year
 _____ Fourth Year
 _____ Fifth Year and Beyond

Ethnicity: _____ White/Caucasian
 _____ Black/African-American
 _____ Asian-American
 _____ Latino/a
 _____ No Response
 _____ Other

APPENDIX B:
Examples of Distracter Tasks

Word Puzzles (from Davis & Bakowski, under review)

Fesssharkted
H₂O H₂O

TTOTID

Word Scrambles

SLSAC

AFELPRP

EEYNM

LRDIOFA

APPENDIX C:
Dependent Measures Questionnaire

1. At the time that you viewed the photo array, how certain were you of your decision?

1	2	3	4	5	6	7
not at all certain				totally certain		
2. How good a view did you get of the car thief?

1	2	3	4	5	6	7
very poor				very good		
3. How well were you able to make out specific features of the car thief's face from the video?

1	2	3	4	5	6	7
not at all				very well		
4. How much attention were you paying to the car thief's face while viewing the video?

1	2	3	4	5	6	7
none				my total attention		
5. To what extent do you feel you had enough information to make a decision regarding an identification?

1	2	3	4	5	6	7
no basis at all				a very good basis		
6. How easy or difficult was it for you to make an identification decision regarding the car thief?

1	2	3	4	5	6	7
extremely easy				extremely difficult		
7. After you were first shown the photos, how long do you estimate it took you to make a decision regarding the car thief?

1	2	3	4	5	6	7
I needed almost no time to decide				I had to look at the photos for a long time to decide		
8. How clear is the image you have in your memory of the car thief you saw in the video?

1	2	3	4	5	6	7
not at all clear				very clear		

Only participants who identified a suspect were prompted to answer question 9

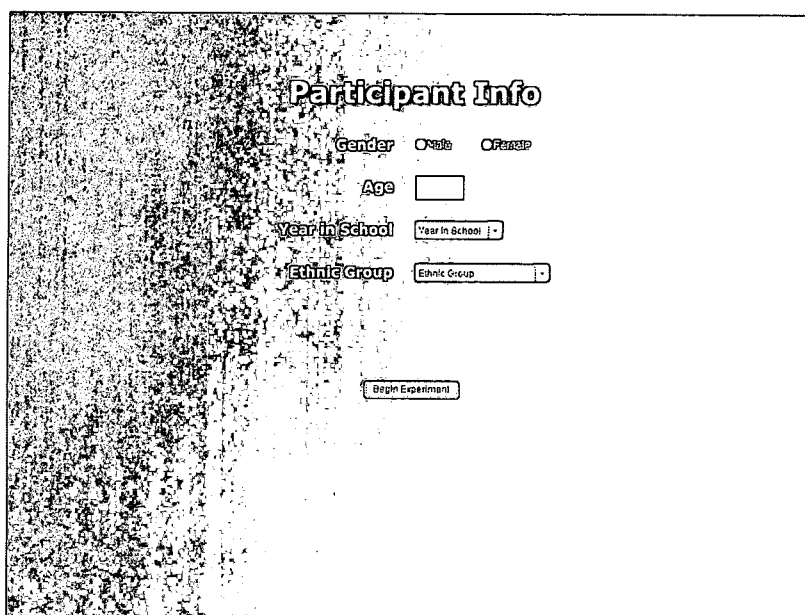
9. On the basis of your memory of the car thief, how willing would you be to testify in court that the person you identified was the car thief in the video?

1	2	3	4	5	6	7
not at all willing				totally willing		

APPENDIX D:

Screenshots of the Eyewitness Program

Figure D1: Participant information questionnaire



A screenshot of a web-based participant information questionnaire. The title "Participant Info" is centered at the top. Below the title, there are four input fields: "Gender" with radio buttons for "Male" and "Female", "Age" with a text input box, "Year in School" with a dropdown menu, and "Ethnic Group" with a dropdown menu. At the bottom of the form is a button labeled "Begin Experiment".

Participant Info

Gender ☐ Male ☐ Female

Age

Year in School

Ethnic Group

Begin Experiment

Figure D2: Crime video

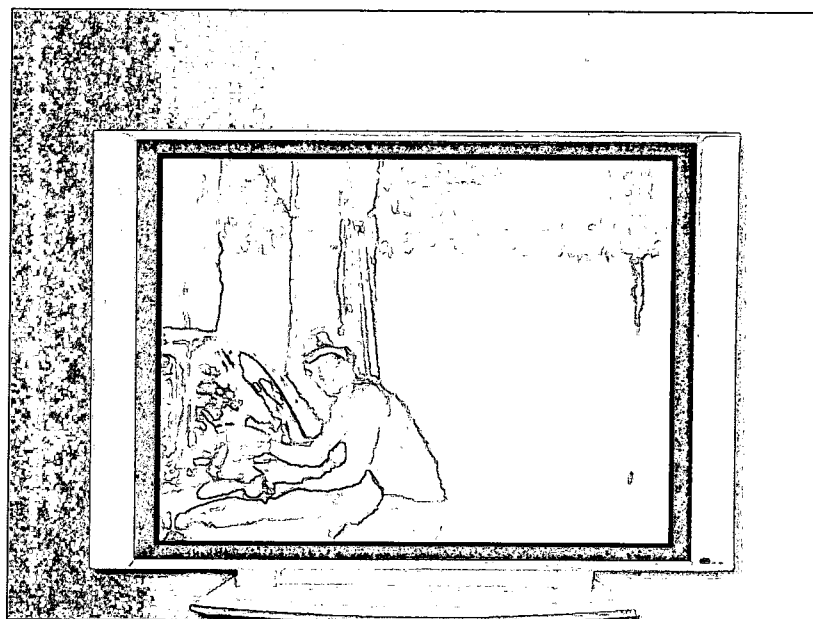


Figure D3: Puzzle instructions

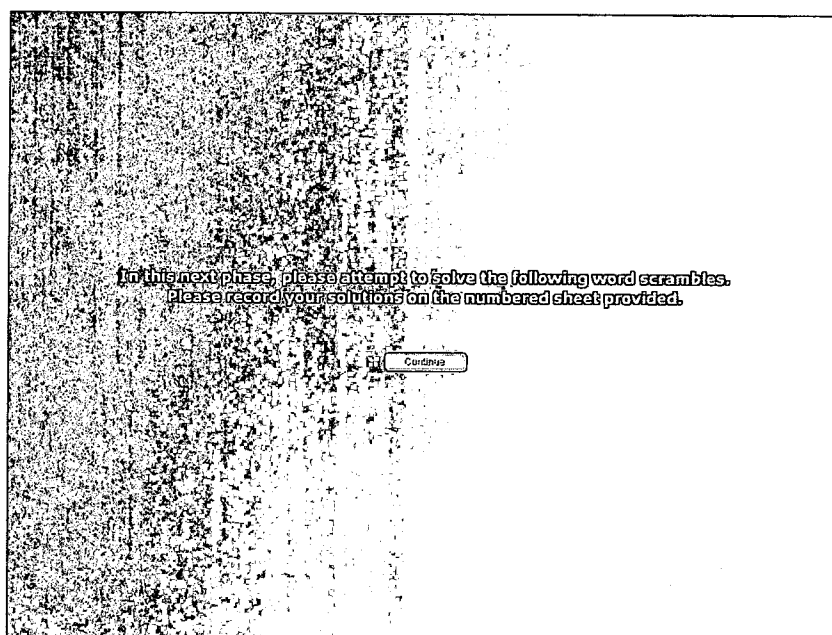


Figure D4: Sequential lineup instructions

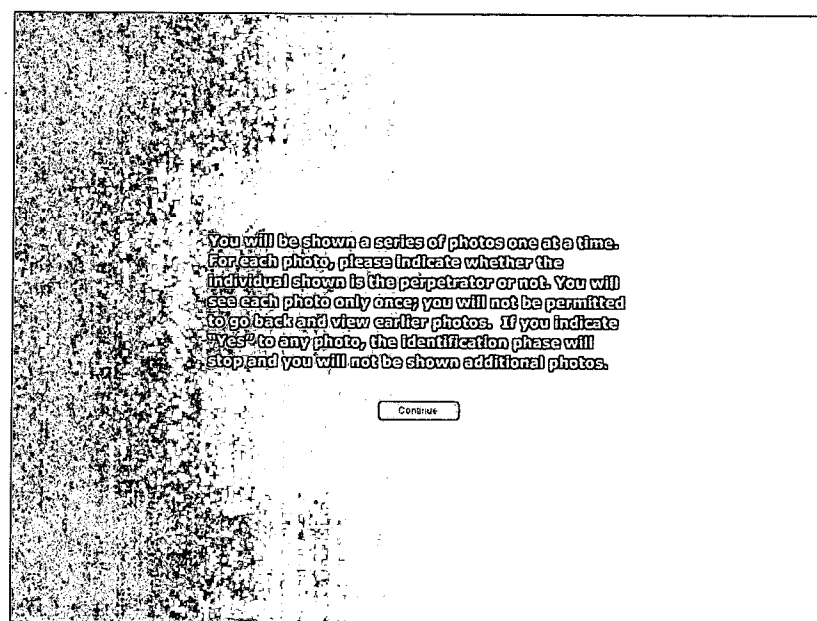


Figure D5: Simultaneous lineup instructions

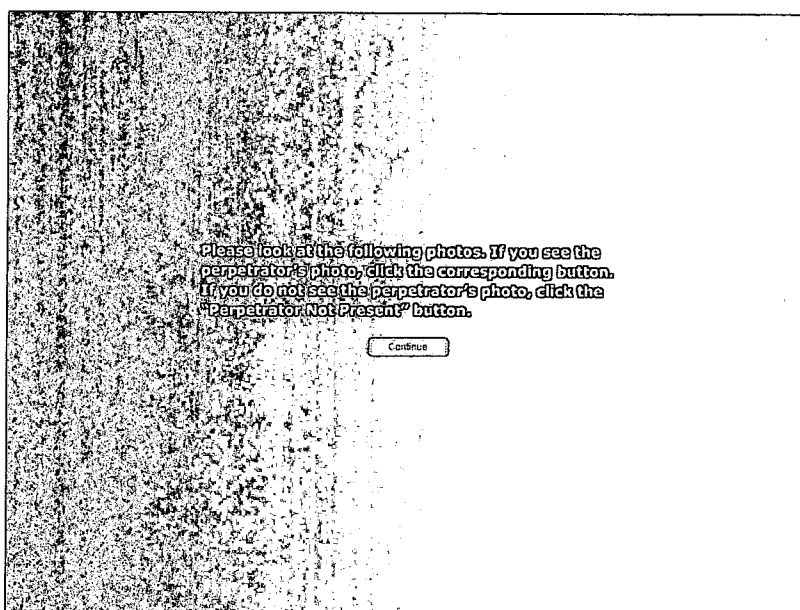


Figure D6: Example of sequential lineup

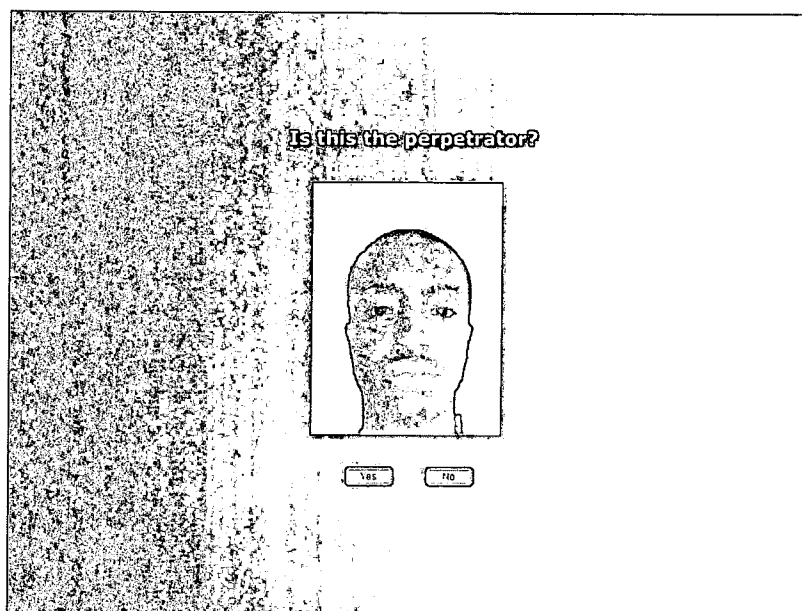


Figure D7: Example of simultaneous lineup

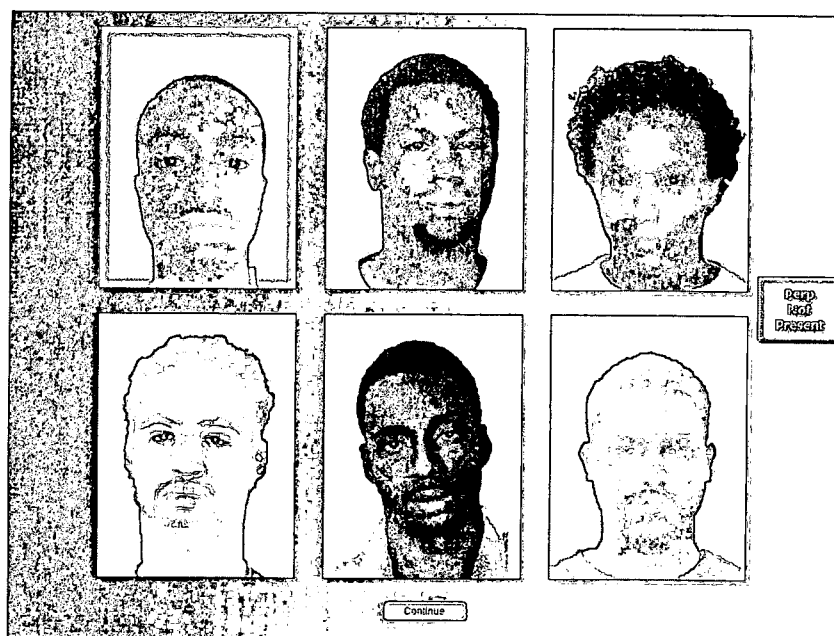
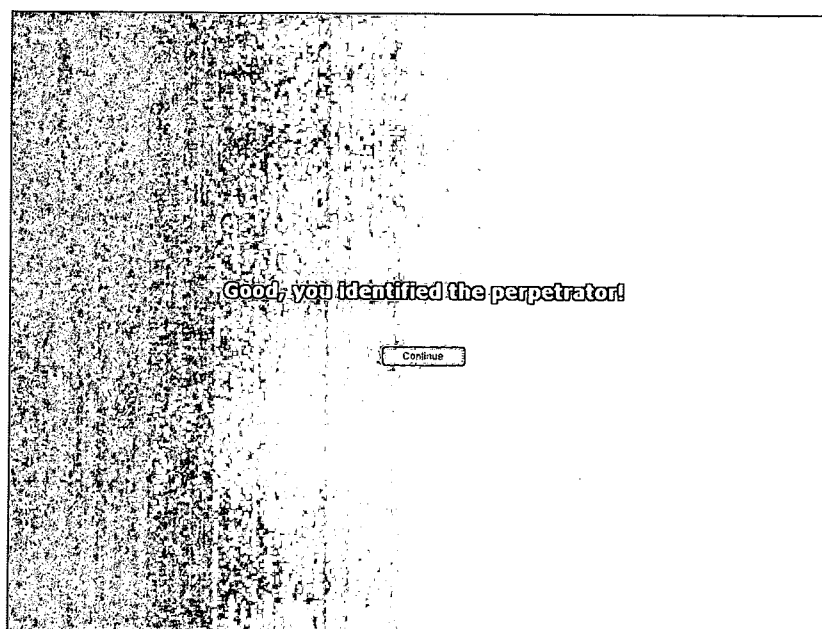


Figure D8: Postidentification feedback



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Figure D9: Questionnaire screen

1. At the time that you viewed the photo array, how certain were you of your decision?

not at all certain ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 totally certain

2. How good a view did you get of the car thief?

very poor ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 very good

3. How well were you able to make out specific features of the car thief's face from the video?

not at all ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 very well

4. How much attention were you paying to the car thief's face while viewing the video?

none ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 my total attention

5. To what extent do you feel you had enough information to make a decision regarding an ID?

not at all ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 a very good basis

6. How easy or difficult was it for you to make an identification decision regarding the car thief?

extremely easy ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 extremely difficult

7. After you were first shown the photos, how long do you estimate it took you to make a decision regarding identifying the car thief?

almost no time ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 a long time

8. How clear is the image you have in your memory of the car thief you saw in the video?

not at all clear ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 very clear

Continue

Figure D10: Ninth item presented to participants who made an identification

9. On the basis of your memory of the car thief, how willing would you be to testify in court that the person you identified was the car thief in the video?

not at all willing ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 totally willing

Continue