Multiple Culprits and Identification Accuracy of Eyewitnesses:
Examining Lineup Procedures

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Abstract

This study examined the accuracy of eyewitness identification in a two culprit crime from simultaneous lineups, sequential lineups, two-person serial lineups, and a paired-serial lineup, as well as the ability of witnesses to describe and match culprits to their actions. Participants ($N = 200$) were presented with either target-present or -absent lineups. When the culprits were present in the lineup, identification accuracy did not vary as a function of lineup presentation mode. Participants were significantly more likely to correctly identify the accomplice than the assailant. When the culprits were absent from the lineup, there was a trend for the two-person serial lineup to produce greater correct rejections. Witnesses were significantly more likely to describe the actions and appearance of the assailant, however, they were more accurate in their appearance descriptions of the accomplice than the assailant. The implications of these results, along with future directions, are discussed.

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Multiple Culprits and Identification Accuracy of Eyewitnesses:

Examining Lineup Procedures

It is surprising that very little empirical research has examined the impact of multiple culprits on eyewitness identification. A key task for eyewitnesses is to accurately identify the culprits and recall the roles they played. The Canadian criminal justice system has no definitive set of guidelines in place to guide identification procedures when there is more than one culprit, as the technical operation of the lineup in cases of multiple culprits is left to the discretion of individual police departments (Deutscher & Leonoff, 1991). Such research may benefit the criminal justice system when one considers the different sentences available to, for example, the gunman versus the driver of the get-away car, in multiple culprit crimes. The present research will examine various lineup procedures when two culprits are involved in a crime and the ability of witnesses to describe and match culprits to their actions.

Memory

The standard theory of human memory and information processing assumes that there are three components to memory; sensory memory, short-term memory, and long-term memory (Atkinson & Shiffrin, 1968). For example, when an individual is witness to a crime, some details of the event are initially encoded into auditory and visual sensory memory, perhaps the colour of the culprit's jacket. From here, the information can move to short-term memory, the register that holds information currently being used, then to long-term memory, the register responsible for storing information on a relatively permanent basis. Within long-term memory, a distinction is often made between the different types of information that is stored. One type is semantic memory, which refers to general world knowledge information, and the other is

episodic memory, which is characterized as pertaining to autobiographical memories.

Beginning with the studies of Bartlett (1932), episodic memory was recognized as far from reproductive and accurate, rather it was found to be reconstructive. Bartlett proposed that individuals' memories do not exist in a vacuum. He viewed memory as a constructive process, by which personal schemata influence memory to rationalize it and create a more coherent whole. Recall of information is subject to various constructions using pre-existing knowledge. The memory being retrieved is not a single, unitary item, but consists of remnants of the initial event being pieced together. Such pioneering research has led to a flurry of studies examining memory distortion in relation to various factors. For example, during the 1970's Loftus began her influential work on eyewitness testimony and memory. These experiments began to assess the impact of leading questions on participants' recall of events (Loftus & Palmer, 1974; Loftus, 1975), and that post-event misinformation can alter memory (Loftus, Miller, & Burns, 1978).

Encoding, Storage, and Retrieval

Memory is typically conceptualized as involving three stages: encoding, storage, and retrieval (Melton, 1963). Encoding refers to the initial acquisition of information, storage refers to maintaining that information over some period of time, and retrieval involves gaining access to that stored information. Eyewitness testimony is a memory task that involves all three stages. It is acknowledged that how information is encoded and stored determines how effectively that information will be retrieved and what cues will best access it. The present research is most concerned with retrieval. Two key aspects of retrieval are given the most attention in eyewitness testimony tasks; recall and recognition.

Recall

Recall is a measure of a person's retention of an event or object where no aid is given to the recaller in his/her attempt to describe the event (Ashcraft, 1994). Recall memory tasks are central to the descriptions that witnesses provide police after viewing a crime. Witnesses are typically asked to describe the events that took place and the culprit(s) appearance(s). This questioning can either be obtained through free or cued-recall. Free-recall is open ended and is analogous to the police officer asking a witness "Can you tell me everything you remember about what took place?", while cued-recall is specific and would entail the officer asking "Can you describe the colour of the culprit's hair?".

Recognition

Recognition memory is involved when the original stimulus (in this case a photograph of the culprit) is presented and the individual has to express whether the stimulus is familiar. This memory task is involved in police lineups. Generally, recognition yields greater memory performance than recall (Roediger & Guynn, 1996). Researchers interested in studying retrieval of faces have developed several methods for conducting research. The following brief discussion provides some basic distinctions between face recognition versus eyewitness identification areas of research that are often thought to be similar to each other.

Eyewitness Identification versus Face Recognition Paradigms

Eyewitness identification and facial recognition studies share some basic similarities, but they also differ in some important respects. At its most basic, participants in both paradigms are presented with some form of an image of a face that they are required to encode. Later they are asked to retrieve that image from short-term or long-term memory through comparing it with an

image or images of other faces in order to determine if they recognize the face as the original image. Face recognition research is not typically concerned with the applied context of eyewitness identification. As a result, there are numerous differences between the two paradigms. First, in face recognition the face is typically encoded from still photographs. Eyewitness identification generally involves staged live or video re-enactment's of criminal activities that provide a full view of the culprit, including more than a close-up of the face. Second, the test images used in face recognition are chosen randomly from a pool of photographs and uses the same target photos as used at encoding, whereas, eyewitness identification carefully selects filler photographs to be used in the lineup task and a novel photograph of the culprit (Weber & Brewer, 2003). Third, face recognition generally presents participants with a target-present test. However, eyewitness identification is not only concerned with a witness' ability to accurately identify a previously seen culprit, but also a witness' ability to judge that the previously seen face is not present at test (Pozzulo & Lindsay, 1998). Therefore, the benefit of eyewitness identification research is its increased generalizability, yielding findings that are more easily applied to real world conditions.

Witness Memory and Lineup Identification

System versus Estimator Variables

Wells (1978) initially introduced the basic distinction between system and estimator variables. System variables are those variables under the direct control of the criminal justice system and are, therefore, variables that lend themselves well to laboratory research (e.g., the effects of lineup instructions). In contrast, estimator variables are those variables that are not under the control of the justice system and whose effect can only be estimated after the fact (e.g.,

characteristics of the culprit, such as sex and race, and characteristics of the witness). To date, the majority of eyewitness identification research has focused on system variables because of its ability to influence the justice system (Lindsay & Pozzulo, 1999). The goal of the present research is to deal with the interface between system and estimator variables, an area that currently has received little attention. Specifically, the system variable of lineup procedure will be examined in conjunction with the estimator variable of number of culprits present at the scene of the crime. In the present paper, the term multiple culprits refers to instances when there are two or more culprits involved in a crime.

Function

A lineup is a procedure whereby a suspect is presented to a witness to verify that s/he is the person who committed the crime in question. Lineups are used by the criminal justice system to obtain proof of a suspect's identity beyond the culprit's description provided by the witness (Wells, 1993). Lineups typically contain the suspect and a number of individuals chosen by the police who are innocent and are referred to as foils, fillers, or distractors. The identification of the suspect in a lineup increases the likelihood s/he is the culprit; the nonidentification of the suspect decreases the likelihood that s/he is the culprit.

Lineup Models

Two types of lineups are possible in reality. Police may arrest a guilty suspect, in which case the culprit is presented to the witness (i.e., a target-present lineup is shown). Alternatively, police may arrest an innocent suspect. In that case, the culprit is absent from the lineup and a target-absent lineup is shown to the witness. Of course, in reality, police have no way of knowing whether their suspect is guilty or innocent.

Target-present lineup. With a target-present lineup, the correct decision is a correct identification; that is, identifying the guilty suspect from the lineup. Two types of errors also are possible; 1) foil identification (identifying a known-to-be-innocent lineup member), 2) deciding that the culprit is not present in the lineup, known as a false rejection.

Target-absent lineup. The only correct decision that is possible with a target-absent lineup is to reject the lineup, declining to choose any member from the lineup. Such an outcome is termed a correct rejection. The target-absent lineup also provides for two types of errors; 1) an eyewitness may again identify a foil, or 2) incorrectly identify the innocent suspect, known as a false identification. Occasionally in eyewitness identification research, a foil is specially selected a priori to represent an innocent suspect. This designation is done to represent the very real possibility that law enforcement may have the wrong suspect in custody and examines the likelihood of eyewitnesses identifying an innocent suspect.

Research has revealed that target-absent lineups are considerably more problematic for eyewitnesses (Wells & Olsen, 2003). For example, in an experiment conducted by Wells (1984) it was reported that inaccurate identifications such as false identifications and foil identifications increased to 56% in culprit-absent lineups, compared to a rate of 6% identification errors, such as foil identifications and incorrect rejections, in culprit present-lineups.

Single suspect models. A single suspect model is one in which there is only one suspect and a set of foils. Foils are used to make the identification a discriminative task because identification of a foil by a witness is a known error (Wells, 1993). The single suspect model is employed most often in research because it provides a pattern of responses that then can be

easily interpreted and applied to the real world (see Table 1).

Multiple suspect models. Within the multiple suspect model, every member of the lineup is a suspect; there are no foils. In this way, it is impossible for the eyewitness to commit a known identification error (see Table 2). The multiple suspect model has been likened to a multiple choice exam with no wrong answer (Wells & Turtle, 1986). It is to be avoided and recommendations have been made to forgo its use by legal authorities (Brooks, 1983; Lindsay, 1999a; Wells, 1988). If more than one suspect is placed in the lineup and the eyewitness simply guesses, the value of the lineup as a test is greatly diminished (Lindsay, 1999b). The lineup can no longer be thought of as a discriminative task whereby the foils are used to create a category of known errors to identify inaccurate from accurate eyewitnesses.

Table 1
Possible Lineup Decisions with the Single-Suspect Lineup

Type of Lineup	Witness Identifies			
	Culprit Innocent	Suspect	Foil	No Identification
Target-present	correct	cannot occur	error*	error**
Target-absent	cannot occur	error***	error*	correct

*foil identification, **incorrect rejection, ***false identification Adapted from Wells (1993).

Wells (1993) makes an important distinction between multiple culprits and multiple suspects that is quite relevant to the present paper. Multiple suspect refers to cases when the police have numerous potential leads that they suspect of committing the crime but have not yet narrowed the choice down to one individual. Multiple culprits refers to a crime involving more

than one culprit. For example, one culprit (the assailant) may have mugged a victim while another (the accomplice) distracted the victim. Therefore, the term multiple suspect model does not denote a lineup containing more than one culprit for the same crime. Rather, it refers to a type of lineup that contains only suspects and no foils.

Table 2
Possible Lineup Decisions with the Multiple-Suspect Lineup

Type of Lineup	Witness Identifies			
	Culprit	Innocent Suspect	Foil	No Identification
Target-present	correct	error*	cannot occur	error**
Target-absent	cannot occur	error*	cannot occur	correct

*false identification, **incorrect rejection

Adapted from Wells (1993).

Each identification outcome outlined in Tables 1 and 2 has practical consequences in the real world. Most attention has been given to the implications of a false identification. Recent research into DNA exoneration cases in the U.S. has confirmed the fears of many and has illustrated that false identifications are the leading cause of wrongful convictions (e.g., Wells & Seelau, 1995; Wells et al., 1998; Wells, Malpass, Lindsay, Fisher, Turtle, & Fulero, 2000). With a false rejection the fear is the possibility that a culprit will go unidentified and never be brought to justice. Errors have important implications for the justice system and have contributed to fuelling important applied research endeavours, such as how to construct lineups and how to conduct lineups.

Constructing Lineups

Foils may be selected on the basis of their resemblance to the suspect, or on the basis of their resemblance to the culprit's description. The suspect and the culprit may not be the same person. A suspect is selected by the police and is suspected of having committed the crime, while the culprit is the individual who did in fact commit the crime. Therefore, a suspect-resemblance selection strategy has foils chosen on the basis of their similarity to the physical appearance to the suspect in custody. For example, if the suspect is of medium height, has dark hair, and a pale skin tone, all of the foils chosen would be of medium height, with dark hair, and a pale skin tone. In contrast, if foils are chosen on the basis of a culprit-description strategy, each suspect would match the physical description that is provided by the eyewitness to the police. Descriptors provided by the eyewitness but that did not match the suspect's appearance would then be matched to the suspect. If neither of these methods are used to select foils, the lineup may be unfair and the odds of a false identification may be greatly increased (Wells, 1993). The lineup would be biased, for example, if the culprit was described as having blonde hair and all the foils chosen had dark hair and the suspect had blonde hair. In this example, the suspect would stand out and is at risk of being chosen as the only likely member in the lineup that could be the culprit.

Wells (1993) recommends in most cases that law enforcement conducting identification tasks should adopt a culprit-description strategy when choosing foils because it is more likely to generate correct identifications. Wells (1993) notes that when a culprit-description strategy is used, there will be more natural variation in the physical appearance of the lineup. Such a strategy is referred to as propitious heterogeneity (Wells, 1993), and it assists the eyewitness in

the identification task through recognition, but does not create bias against an innocent suspect. Essentially, when using the description of the culprit, rather than the suspect's appearance, the lineup will contain members that generally match the witness' pre-lineup memory of the culprit, but will not contain clones of the suspect. Too much similarity between the suspect and foils will confuse witnesses and hinder accurate identifications (Luus & Wells, 1991). However, if the description provided by the witness is lacking in sufficient detail a suspect-resemblance strategy of foil selection may be more beneficial (Wells, 1993).

Conducting Lineups

The nominal size (i.e., the number of members in the lineup) of a lineup varies; however, in Canada, a 12-person lineup is typical, while the use of a six-person lineup is typical in the U.S. and in research (Nosworthy & Lindsay, 1990). Nominal size of six versus 12 does not appear to yield different identification accuracy rates. It is logical that as the number of viable lineup members increases, the probability of false identifications is lessened because identifications are spread out over foils (i.e., known errors). For example, Levi (2002) points out that "a 40-person lineup affords eight times the protection than a 5-person lineup" (p. 40). Research examining lineup identification accuracy has typically used a nominal size of six, which may be based on the standard practices of law enforcement in the U.S. However, research that has examined the impact of variations in nominal size on identification rates has typically found that it has little effect for sequential lineups (Lindsay, Smith, & Pryke, 1999; Nosworthy & Lindsay, 1990). Therefore, the present research will continue to use a lineup size of six.

The lineup can be presented to witnesses via pictures (photo-lineup), live, or video. Research indicates that that there is not a substantial impact on identification accuracy between

live versus photo lineups on eyewitness identification (Cutler, Berman, Penrod, & Fisher, 1994). The police prefer photo-lineups because of the reduced time and cost involved in finding suitable foils. Video presentation of the lineup is rare. However, in England video identifications are being used more frequently (Valentine & Heaton, 1999).

Some researchers are now recommending computer display of the lineup (Levi & Jungman, 1995). Computer display is more useful and frequently used for mug-shot tasks where the police do not yet have a suspect and the witness must search through a large number of pictures (Lindsay, Nosworthy, Martin, & Martynuk, 1994). A city the size of Ottawa, for example, may expose a witness to 1000 mug shots or more at one time. Aside from the medium chosen to display the lineup, various lineup procedures have been employed by legal authorities and tested empirically.

Presenting Lineups

Simultaneous lineups. In a simultaneous lineup, the witness views all lineup members at the same time. Such a procedure permits, and possibly, encourages the use of a relative-judgment process (Wells, 1984). That is, the witness chooses the lineup member that most closely resembles his/her memory of the culprit relative to the other members of the lineup being viewed. The task thus becomes a comparative process. Relative-judgment decisions are problematic and can have grave consequences if one is viewing a target-absent lineup. More specifically, the possibility for a false identification increases since the most similar lineup member is not the culprit.

Sequential lineups. The sequential lineup procedure was developed by Lindsay and Wells (1985) as an alternative to the simultaneous procedure to eliminate witnesses' use of a relative

judgment process. The sequential lineup forces an absolute judgment strategy. The witness is shown each lineup member one at a time and is asked to decide whether or not that person is the culprit before being allowed to view the next member. Once a picture of a lineup member has been seen, the eyewitness can neither go back to that photograph, nor can s/he scan ahead in the sequence. Prior to viewing the sequential lineup, the witness is instructed that the culprit may or may not be present and is informed about the rules of viewing. The witness also is unaware of the exact number of photographs to be viewed. Lindsay and Wells (1985) reasoned that if relative-judgments were a contributing factor in false identifications, then this new sequential method would inhibit such a judgment process and in turn, decrease false identifications while maintaining correct identifications.

The researchers (Lindsay & Wells, 1985) tested the sequential procedure by exposing unsuspecting participants to a live staged crime where a confederate stole a calculator. The participants then were asked to make identifications from one of four lineups: culprit-present simultaneous, culprit-present sequential, culprit-absent simultaneous, or culprit-absent sequential lineups. The results indicated that the rate of correct identification did not differ significantly as a function of lineup procedure. More important, false identifications decreased significantly with the use of the sequential versus simultaneous lineup procedure.

Lindsay, Lea, Nosworthy, Filford, Hector, LeVan et al. (1991) collected data assessing to what degree participants used a relative versus an absolute judgment process in making identification decisions after viewing a staged crime. After the identification task participants were presented with definitions of relative and absolute decision processes and were asked to rate the degree to which they used these judgments in making their identifications. Those

witnesses that reported using a relative-judgment process of decision-making more often made false identifications. Finding further support for Lindsay and Wells' (1985) postulation of relative versus absolute judgments, Sporer (1993a) analysed decision times for witnesses. He found that witnesses who took longer to reach a decision about the identity of the suspect were more likely to make a false identification. Witnesses that reached their decision more quickly were more likely to be correct. Sporer reasoned that the comparative or elimination process of relative judgments should take longer than an absolute judgment process. However, it is unclear if participants were in fact engaging in such decision-making processes because it was not assessed.

Kneller, Memon, and Stevenage (2001) did attempt to assess the decision-making strategies of participant-witnesses. Upon completion of the lineup identification task, witnesses then were instructed to complete a questionnaire that assessed automatic or more deliberate decision-making strategies (e.g., 'his face just popped out at me' or 'I first eliminated the ones that I was sure were not him, then I chose among the rest'). A significant relationship was found between lineup procedure and the use of a self-reported relative strategy. More witnesses shown a simultaneous lineup indicated using a relative strategy than those shown a sequential lineup. In contrast to expectations, witnesses, however, were equally likely to have reported either an absolute or relative strategy in the sequentially presented lineup conditions.

On the surface, it would appear that sequential presentation of a lineup does not automatically compel the use of an absolute strategy. However, it is also possible that witnesses are not proficient at reporting internal, cognitive processes (Nisbet & Wilson, 1977). It does appear, though, that the absolute strategy is associated with whether a witness is accurate,

regardless of the type of lineup or presentation style; in that the use of an absolute strategy resulted in greater accuracy.

Since the original research of Lindsay and Wells (1985), numerous studies have replicated the results (e.g., Cutler & Penrod, 1988; Kneller, Memon, & Stevenage, 2001; Sporer, 1993a), examined the lineup procedure with other variables (Lindsay, Pozzulo, Craig, Lee, & Corber, 1997; Parker & Ryan, 1993), and modified the original presentation technique (e.g., Lindsay & Bellinger, 1999; Levi, 1998; Melara, DeWitt-Rickards, & O'Brien, 1989; Pozzulo & Lindsay, 1999).

In light of the numerous results, Steblay, Dysart, Fulero, and Lindsay (2001) undertook a meta-analytic comparison of eyewitness accuracy rates in sequential versus simultaneous lineups. Overall, it was found that sequential lineups produced significantly more correct decisions than simultaneous lineups. However, a different pattern of results emerged when the data were further analysed to compare eyewitnesses' accuracy rates when the target was present versus absent from the lineup. The data indicated that in target-present lineup conditions, correct identifications were significantly more likely with a simultaneous procedure versus a sequential procedure. In contrast, with target-absent lineups, correct rejections of the lineup were higher with sequential presentation, and false choices (of any lineup member) and false identifications were significantly lower.

The sequential lineup forces witnesses to use an absolute judgment strategy that may not be as effective as relative judgments for target-present lineups. However, it does greatly reduce the likelihood of false identifications in target-absent lineups. As Steblay et al. (2001) explain, "this may leave the police (and researchers) in the position of having to decide which error is

more important, failing to identify a culprit or falsely identifying an innocent person” (p. 469).

However, when moderator variables are considered, such as the sample used and other methodological issues, the difference between the two procedures becomes much smaller (Stebly et al., 2001).

Despite the success of sequential lineups in decreasing false identifications, there are limitations that have acted as points of departure for modifications of the original presentation mode. For example, it has been found that the sequential lineup is not as effective for children, and an alternative lineup procedure has been created for this group (Pozzulo & Lindsay, 1999). The issue of a lowered correct identification rate has received some attention as well. The concern presented by Levi (1998) is that of the guilty culprit escaping justice. Levi fears that witnesses may sometimes chose a foil that appears before the target in the sequential lineup. In addition, Levi and Jungman (1995) describe through probability statements using Bayes' Theorem that mistaken identifications may still be too high with a sequential lineup.

As a result of the favourable findings with the sequential lineup, numerous researchers have made recommendations that legal authorities adopt its use (Cutler & Penrod, 1988; Levi, 1998; Levi & Lindsay, 2001; Lindsay, 1999a; Lindsay, Lea, & Fulford, 1991; Lindsay & Pozzulo, 1999; Parker & Ryan, 1993; Wells et al., 1998). The sequential lineup procedure is now being used in parts of Ontario (Lindsay & Bellinger, 1999) and in New Jersey (Wells, 2001). Despite the significant progress that has been made, none of these findings and recommendations can yet be applied to multiple culprit crimes.

Multiple Culprits

As stated earlier, most eyewitness identification research examines single culprit crimes.

Available research does indicate that as the number of culprits increases, accurate eyewitness identification rates decrease (Clifford & Hollin, 1981; Yarmey, 1982). Except, we are unaware how the basic theories of lineup structure and procedure highlighted above operate with crimes involving multiple culprits. A study by Geiselman, MacArthur and Meeroovitch (1993) provides some information as to the effects of two culprits on subsequent witness identification in target-present and -absent lineups. Participants were shown a video of a staged purse snatching involving an assailant (the purse snatcher) and accomplice (the get-away driver). The participants then were presented with one of three photo arrays (assailant-present, accomplice-present, or both culprits absent). Each participant was told that the culprit may or may not be present, that the appearance of the culprit may have changed, and to ignore any differences between the photos. A significantly greater percentage of participants were able to identify the accomplice than the assailant. In the culprit absent condition, 61% of participants correctly rejected the photo array for the accomplice, compared to 39% false positives for the assailant lineup.

It is worth noting that the study described above was concerned primarily with the phenomenon of unconscious transference, or more specifically, role transference among culprits. Unconscious transference (UT) refers to instances when an eyewitness mistakenly identifies another person as the culprit because of prior exposure to that individual typically not in a crime context. The term was originally used by Glanville Williams to describe this specific type of mistaken identification (as cited in Loftus, 1976). It differs from other false-positive misidentifications because it is meant to describe the “transfer of one person’s identity to that of another person from a different setting, time, or context” (Read, Tollestrup, Hammersley,

McFadzen, & Christensen, 1990, p. 3). Although unconscious transference has received mixed results in research efforts, it appears to be generally accepted as a possible, although rare, occurrence (Geiselman, et al., 1993; Kassin, Tubb, Hosch, & Memon, 2001; Phillips, Geiselman, Haghghi, & Lin, 1997; Read, 1994; Read et al., 1990). It would be worthwhile to determine if there is some degree of role transference involved in eyewitnesses' identifications of multiple culprit crimes.

However, very little research has addressed the question of unconscious transference as a whole, and even less has examined the phenomenon under circumstances involving multiple culprits. Most research has investigated unconscious transference as it relates to the misidentification of innocent bystanders, which is why it has sometimes been termed bystander misidentification. Three key theoretical approaches have been outlined in the literature to account for the phenomenon of unconscious transference (Phillips et al., 1997; Ross, Ceci, Dunning & Toglia, 1994). The traditional explanation focuses on automatic processing while more recent research efforts have offered theories of source monitoring or memory blending to the issue.

Automatic processing

Original research exploring bystander misidentification has assumed that witnesses unconsciously replace the assailant with an innocent bystander during either the encoding or processing stage of the memory (Loftus, 1976). A case that has become renowned in the field illustrates this concept well. Houts (1956) described a ticket agent in a railroad station in the United Kingdom who had been the victim of an armed robbery. From a police lineup the ticket agent chose a sailor as the robber, except the sailor had a concrete alibi providing proof that he

could not have been at the station at the time of the robbery. The ticket agent was later questioned as to why he had misidentified the sailor, and in response stated that the sailor appeared familiar. The sailor was familiar to the agent because he had bought train tickets from the agent on numerous past occasions (cited in Ross et al., 1994).

Accordingly, this traditional explanation posits that the automatic processing of the bystander to memory leads to later misidentifications based solely on a sense of familiarity to the eyewitness when s/he is presented in a police line-up. Automaticity suggests processes that are too fast to be accessible to conscious awareness. For unconscious transference, the implication has historically been that the face of the bystander, like other mundane events, is processed and stored without awareness. Later, retrieval of that memory trace is enhanced through recognition of the familiar face (Ross et al., 1994). The problem, however, has been that is difficult to prove the automaticity of storage and retrieval for the face in question, leading researchers to infer that this is indeed the process at work behind the scenes.

Some of the earliest research directly examining unconscious transference relies on this 'familiarity effect' explanation. In an experiment by Loftus (1976), participants heard a story about six male college students. As each character in the story was introduced, a photographic slide of him was viewed by the participants for two seconds. Three days later the participants returned to identify the target from a set of five photographs. One half of the participants viewed a target-present recognition set and the other half viewed a target-absent set of photos where the target's picture had been replaced with a picture of a bystander from the story. The bystander appearing in the lineup was varied for different participants. In the target-present line-up, 84% of the participants correctly identified the target. In the target-absent lineup, 60% of the participants

misidentified the previously seen bystander. Loftus attributes these findings to unconscious transference, and cites the “malleable nature of human memory” as one aspect of the problem, whereby “brief exposure to a person can cause him to look familiar when he is seen later” (1976, p. 97).

Source monitoring errors

The source monitoring perspective stems from the work of Marcia Johnson and colleagues (Johnson & Raye, 1981; Johnson, Hashtroudi & Lindsay, 1993; Lindsay & Johnson, 1989; Mitchell & Johnson, 2000). Such a perspective gives more responsibility to the eyewitness and his or her conscious decision-making. Here the eyewitness is aware of both the culprit and the other bystander(s) at the scene of the crime, but the eyewitness switches the roles of the people involved at the retrieval and recognition task. Such an error has been referred to as a source monitoring error because of the confusion in incorrectly attributing the origin or source of the memory (Lindsay, 1994). The error occurs because the two memories may have much in common. For example, the bystander and the culprit would both be present at the scene of the crime, consequently they would share much of the same contextual information particular to that scene, thus making it difficult to easily distinguish the two. In the same vein, if both the culprit and the bystander were highly similar in their physical appearance, one could hypothesize that it would be even more difficult to correctly attribute the source of the memory.

Memory blending

A memory blending interpretation of unconscious transference suggests that the eyewitness recalls having seen the actions of both the culprit and the bystander, but thinks that

they are the same person. Therefore, at the time of the identification task, the eyewitness believes that s/he only saw one person who carried out both roles.

Ross et al. (1994) sought to discern the underlying processes involved in unconscious transference by performing five experiments that included contextual questions to assess “who did what and where”. Participants were asked to watch a video-taped film of teachers interacting with students. At the end of the film, one of the teachers was robbed. Only participants in the transference condition additionally saw a male bystander reading a story to a group of children before the robbery took place. Immediately after viewing the film, participants were asked to identify the assailant from a target-absent lineup that contained the bystander and four unfamiliar foils. In experiment 1, those in the transference condition were approximately three times more likely to misidentify the bystander as the culprit than participants in the control condition. In response to context questions that were designed to uncover the source of their error, 66% of the transference participants incorrectly stated that the assailant was seen in a context outside of the cafeteria and 27% claimed they remembered the ‘robber’ reading to the children, while participants in the control condition did not make these errors. Many of the participants in this research thought the bystander and assailant were the same person.

Experiment 2 (Ross et al., 1994) took these findings a step further by hypothesizing that the unconscious transference effect would be eliminated if participants were informed that the bystander and assailant were two different people. As predicted, when participants were informed that the two individuals were different people, misidentification rates of those in the transference condition dropped to a level comparable to control condition participants from the first experiment. Ross et al. (1994) interpret these findings as an indication of the existence of

two separate memories for the assailant and bystander that are linked by a contextual tag.

Once it was made clear to the participants that the bystander and assailant were two separate people, the tag was eliminated and the blending effect disappeared.

Few studies have examined the descriptions of those involved in the crime provided by eyewitnesses. Limited research using one culprit indicates that these descriptions tend to be vague and limited in detail (Lindsay, Martin, & Weber, 1994; Pozzulo & Warren, 2003). The present research hopes to further explore this area in the context of multiple culprit crime. Descriptors can be examined for memory and person errors, perhaps finding evidence of role transference or source confusion.

Unconscious Transference and Multiple Culprits

Geiselman, Haghighi, and Stown (1996; experiment 1) explored UT in a multiple culprit crime. The researchers specifically examined witnesses' ability to correctly assign roles to the assailant and accomplice. Participants were shown a crime video and after a one-week delay, the witnesses were shown two photo-lineups in succession; one contained the assailant, and the other, the accomplice (although it is not clear if they were informed of such). Those witnesses who made an identification were then asked to provide a written description of the person they selected as having been involved in the crime.

The results indicated that with assailant present lineups, approximately 75% of the time that witnesses made a correct identification, they correctly labelled the assailant. However, in contrast, less than half of the witnesses correctly labelled the accomplice as the accomplice. Witnesses making foil identifications labelled their selection as the assailant two-thirds of the time. Geiselman et al. (1996) reasoned, therefore, that there appears to be a bias to label anyone

selected from the lineup as the assailant. This pattern of role assignment responses also held for the second lineup, as many of the witnesses assumed that different pictures of the same assailant appeared in each lineup. Accordingly, only a small amount of witnesses made correct identifications on both lineups (3.4%). It is not clear what specific instructions witnesses were given about why they were viewing two lineups. It is possible that the witnesses were not told that they would view one lineup for each culprit and that each lineup would contain only the assailant or the accomplice.

In addition to examining role transference, a key effort of the present research is to determine the lineup procedures most effective for multiple culprit crimes. There appears to be no published data examining the impact of sequential presentation on lineups with multiple culprits. Fortunately, the meta-analysis conducted by Steblay et al. (2001) did include some unpublished experiments with multiple culprits. They reported that, with more than one culprit, the sequential superiority effect was removed in target-absent lineups. In target-present lineups, the simultaneous procedure produced similar patterns of accuracy for both single and multiple culprit lineups. Unfortunately, it is yet to be determined precisely how these experiments were conducted. Therefore, it is difficult to understand why the sequential superiority pattern was eliminated. Perhaps forcing witnesses to adopt an absolute judgment strategy somehow interferes with the recognition and identification process involved in multiple culprit crimes. From personal correspondence with one of the authors, however, I was informed that the task is formidable but worthy of continued research because new approaches would be promising (R. C. Lindsay, personal communication, August 8, 2002).

Lineup identification for crimes involving more than one culprit is a complex task. To

begin with, it is difficult to determine precisely how the lineup should be constructed. If both suspects are placed in the same lineup the result could be conceptualized as a multiple suspect model. If the multiple suspect model is to be avoided at all costs, then the obvious solution is to create two separate lineups for each culprit involved in the crime in question. Although time consuming, it may be the only way to ensure a fair and unbiased lineup in multiple culprit crime situations.

The next question becomes one of how to select the foils that will be included in the lineup. If two separate lineups are created and presented for each culprit, two separate sets of foils should also be chosen. Each set of foils can be selected based on their similarity to the physical appearance of each suspect or to the witness' descriptions (Wells, 1993).

If two lineups are shown to each witness, a new problem to consider is how to present the lineups. Since two separate lineups for each culprit will have to be shown to the witnesses, it would be logical to inform witnesses of this. Although witnesses can be informed that they will be seeing two separate lineups, they cannot be told specifically which culprit (i.e., main culprit or accomplice) they are attempting to identify because this information may not be clear to the police. Thus, witnesses will need to provide an identification decision and state the role of the culprit they are identifying for each lineup. As for which lineup procedure is more effective under these circumstances, that is what the present research will examine.

Current police practice

From personal communication with a member of the Ottawa Police Services (OPS), I was able to determine the current procedures in place for lineup identification. The typical lineup is composed of the suspect and 11 other members. Traditionally, lineups were conducted live, but

more often photo-lineups are now being used because of the difficulty in locating volunteers to pose as fillers (foils). Fillers are chosen based on their physical similarity to the suspect. The lineup is presented sequentially to the eyewitness. Cases involving multiple culprits are treated as cases having more than one suspect. In these cases, a separate lineup is constructed and presented for each of the culprits, using the sequential procedure.

A possible limitation to current practice follows from cognitive psychology. That is, the witness will have seen one crime committed by two culprits, but in the lineup identification s/he is being asked to treat the event as two separate recognition tasks. It is hypothesised that recognition memory may not be aided by forcing the witness to treat the crime as two isolated, discreet events, where the culprits are shown as categorically separate from one another through distinctly different lineup tasks, perhaps even shown to the witness at two different times (Ashcraft, 1994). Consequently, isolating the two culprits from one another in such a manner may provide more opportunities for role transference effects that can be likened to external source monitoring errors (Johnson, Hashtroudi, & Lindsay, 1993).

Also, the meta-analysis by Steblay et al. (2001) provides some indications that sequential lineups may not be effective in multiple culprit crimes under target-absent conditions. The authors conducted a large meta-analysis examining identification accuracy rates in simultaneous and sequential lineup presentations. For the three tests in which the lineup contained more than one culprit, target-absent lineups that were presented sequentially failed to show increased correct rejections. The simultaneous lineup procedure continued to be equally effective in target-present lineups for multiple culprits.

Thirdly, using two lineups may create expectancy effects or demand characteristics. For

example, the officer may state for the first lineup that the witness is searching for the main assailant and that the second lineup is for the accomplice, thus prompting the witness to make a false identification of an innocent suspect for one or the other culprit. Along the same lines, with two sequential lineups the witness may develop knowledge as to how many photos are actually in the lineup, and that deviates from the recommended sequential procedure (Lindsay & Wells, 1985). Finally, it is time consuming and taxing for both the police and the witness to view two large lineups.

A New Lineup Procedure

Considering the relevant literature presented here and the current police practices outlined above, the following examination of lineup procedures for multiple culprits is proposed. This research will compare simultaneous and sequential lineups used by police to a newly developed *two-person serial lineup*. The present study will focus on a two culprit crime.

For the two-person serial lineup, the witness will view 12 lineup members, but they will be presented in pairs, meaning that the witness will view six sets of photos sequentially. At first, the two-person serial lineup procedure may appear to be a multiple suspect model. However, the two suspects will not be paired together. In this manner each suspect will always be paired with a foil, and the remaining paired lineup members will be foils. Therefore, for example, the first set of photos will be two foils matching the accomplice's description, the second set will contain one foil and one suspect (e.g., the assailant), the third set will contain another two foils matching the accomplice's description, the fourth set will contain two foils again yet this time matching the assailant's appearance, the fifth set will contain a suspect (e. g., the accomplice) and a foil, and so on. When presented with each two-person photo set, the witness will be asked to make an

identification and state the culprit's role in the crime, if a photo is chosen. Overall, there will be six sets of photos for the assailant and six sets for the accomplice. These sets will be interspersed.

Considering that at the time of the crime, the witness will have seen two culprits together, perhaps recognition memory may be aided if s/he is later asked to make the identification from a flowing lineup where sets of two lineup members appear together; one photo matching the assailant and one matching the accomplice. Such a procedure may contribute to a context reinstatement effect. For example, Sporer (1993b) hypothesized that clothing surrounding a face may act as a retrieval cue during recognition. Participants were shown 30 faces where the target's clothing was either visible or not visible at the study phase. Fifteen minutes later, participants were then shown 60 faces (30 new, 30 old), and were asked to indicate for each whether or not the participant had seen the face before. At this test phase, faces were presented with visible or non-visible clothing. Thus, four conditions were created: 1) no context at study or test, 2) no context at study, but context present at test, 3) context at study, but not at test, and 4) context present at both study and test. The results indicated that recognition was aided by congruence effects. That is, in the two conditions in which there was no change of context between the study and test phases, recognition performance was significantly better than in the change of context conditions.

In face recognition research, context effects have been examined in the form of the background in which the face is portrayed (Davies & Milne, 1982), the described personality of the face (Baddeley & Woodhead, 1982), clothing cues (Sporer, 1993b), and the accompanying face when faces are presented as pairs at study (Winograd & Rivers-Bulkely, 1977). For the most

part, research indicates that memory performance is enhanced when there is a close correspondence between the study and test conditions, while incongruence between acquisition and retention depresses our memory performance.. For example, a meta-analysis of facial identification studies by Shapiro and Penrod (1986) found that recognition rates were increased as a function of context reinstatements across 23 conditions in which it was used.

Tulving and Thompson (1973) indicate that an important reason for this is the encoding specificity principle:

“What is stored is determined by what is perceived and how it is encoded, and what is stored determines what retrieval cues are effective in providing access to what is stored” (p.353).

Typically, experiments examining encoding specificity employ a 2x2 design, termed an encoding/retrieval paradigm, where two encoding conditions are crossed with two retrieval conditions (Roediger, 1996; 2000).

The encoding specificity position can certainly apply to crime scene information involving more than one culprit. Information into memory is not encoded as isolated, individual items. Each item is encoded into a richer memory representation that includes additional information present at the time; for example, the other person present at the scene. Extending this type of research and idea, there may exist a contextual tag between the two culprits. In fact, this has been found through research examining UT and mistaken identification of bystanders to a crime (Ross et al., 1994). Therefore, for retrieval in lineups, cues should be used that help match the originally encoded representation of the memory, thereby producing effective access to what was stored. Thus, asking witnesses to make identification decisions from a series of two-person

lineups may help enhance recognition memory.

Taking the idea of encoding specificity as it is applied to the eyewitness identification situation one step further, a second serial lineup procedure is proposed and will be tested in the present research. For exploratory purposes, this *paired-serial lineup* tests the idea that each culprit provides a context for the other culprit at the scene of the crime. An early study of context in facial memory by Winograd and Rivers-Bulkley (1977) presented participants with pairs of faces. Recognition was tested by presenting identical pairs at study and test, when only one face was presented, or when a new face replaced one in the pair. In line with their predictions and the encoding specificity theory, recognition was impaired by a change in context. Such a lineup procedure does not violate the single-suspect model recommended by Wells (1988). As highlighted earlier in this paper, there is a difference between numerous suspects to one crime and multiple culprits to one crime.

The two-person serial and paired-serial lineups being proposed here may in fact be incorporating both relative and absolute judgment strategies. Witnesses will be presented with pairs of photos one at a time. Since the witnesses will see two photographs together, they may at first use a relative judgment strategy in deciding between the two photos. However, because witnesses will be aware that further sets of photos are to be viewed, they will then have to rely upon an absolute strategy that forces them to consider that the culprit may yet appear, thus, comparing each photograph to their visual memory of each culprits' appearance. It is typically thought that a witness' tendency toward relative judgments dictates that s/he will produce a false positive whenever the real culprit is absent from a simultaneous lineup. But perhaps under multiple culprit conditions, the witness needs to first make that relative judgment between the

two suspects. Then, to promote a fair lineup and attempt to reduce false positives, an absolute judgment strategy must be forced into the witness' decision-making process.

The new serial lineup methods being proposed here avoid the problems associated with using one six-person sequential lineup for each culprit. Because the two-person mini lineups are presented one after another, the witnesses will be aware that they will be attempting to identify both culprits at some point throughout the series. Similarly, the paired-serial lineup may enhance accurate role assignment for the crime.

Predictions

Identification Decisions

Previous research has indicated that identification decisions across target-present and –absent lineups may be driven by different processes (Pozzulo & Lindsay, 1999; Pozzulo & Warren, 2003). These authors hypothesize that correct identification decisions in target-present lineups are guided by cognitive factors, while correct rejections in target-absent lineups are guided by a combination of social and cognitive processes. Accordingly, the present data will be divided into those witnesses who see target-present versus target-absent lineups. This division is also logical given that the accuracy of each type of lineup (correct identification versus correct rejection) differs for each.

Target-present lineups. Across all four lineups (standard simultaneous, standard sequential, two-person serial, and paired serial), witnesses are expected to be more accurate with assailant-present versus accomplice-present lineups; therefore, they will have a higher correct identification rate for the assailant versus the accomplice. It is predicted that the correct identification rate with the paired lineups will be higher than the rate with the simultaneous or

sequential lineup for the assailant. Likewise, it is predicted that the correct identification rate with the paired lineups will be higher than the rate with the simultaneous and sequential lineup for the accomplice.

Target-absent lineups. Collapsing across lineup procedure, witnesses are expected to have a higher correct rejection rate for the assailant versus the accomplice. It is predicted that the serial lineups will produce a higher correct rejection rate than the simultaneous and sequential lineups for the assailant. It is predicted that the correct rejection rate with the paired lineups will be higher than the rate with the simultaneous or sequential lineup for the accomplice.

Descriptions

It is predicted that witnesses will provide a larger number of action and appearance descriptors for the assailant than the accomplice, due to the central role of the assailant. Witnesses also are expected to be more accurate in describing the actions and appearance of the assailant than the accomplice.

Role Assignment

It is predicted that correct role assignment will be at a higher rate in the serial target-present lineups overall, as evidenced by witnesses' responses to role descriptor questions (i.e., asking participants to describe that person's role in the crime if a lineup identification is made) and their identification decisions, versus the simultaneous or sequential lineups.

Method

Participants

Participants consisted of 200 students from Carleton University who either received course credit for their participation or were entered into a cash draw. The mean age of the

participants was 27.6 years ($SD = 9.28$; range 18 to 61); 122 were female, 77 were male, 1 participant failed to report his/her age and sex.

Design

A 2 (presence/absence of culprits) x 4 (lineup procedure) between subjects design was used. The dependent measures included witnesses' descriptions of the culprits (coded for quantity and accuracy), witnesses' identification decisions, and witnesses' accuracy in the assignment of the two culprits' roles. Participants saw a brief film depicting a staged crime involving two culprits. After viewing the crime the participants were asked to make identifications from one of four types of lineups (simultaneous, sequential, two-person serial, or paired-serial lineup). Half of the participants (now witnesses) were asked to make an identification from target-present lineups, while the remaining half were shown target-absent lineups for identification.

Stimulus Materials

Film. The staged crime was presented to participants in colour and lasted approximately 60 seconds. The crime consisted of two Caucasian males mugging a female victim. The assailant was 22 years of age, tall, with short light brown hair, and a medium build. The accomplice was 24 years of age, medium height, with short dark brown hair, and a heavier build. The video began with a clear view of the culprits loitering inside a stairwell and discussing their plan, thus providing the opportunity for a clear view of the culprits. A close-up view of the culprits was presented for approximately 20 seconds. Then, a 28-year-old Caucasian female was seen entering the area. When the victim appeared, the accomplice stepped in front of the victim and inquired if the library was in the direction he was pointing, distracting her from the assailant about to snatch her purse. When the victim began to give directions to the library and was

sufficiently distracted, the assailant grabbed her purse. The accomplice and the assailant then ran away from the victim in opposite directions.

Description form. After viewing the film, participants were asked to complete a description form that asked them to describe the crime in the video, the assailant's appearance, and the accomplice's appearance (see Appendix A). The description forms were coded for total number of action descriptors for the accomplice, total number of action descriptors for the assailant, total number of appearance descriptors for the accomplice, and total number of appearance descriptors for the assailant. Action descriptors included any descriptor provided that detailed the culprits' activities prior to and during the crime [e.g., 'the assailant grabbed the woman's purse (1 point) and ran away (1 point)' was counted as two action descriptors]. Proportions of correct total descriptors were then calculated for each of the above categories. Age, height, and weight were given an acceptable range (age ± 3 years; height ± 2 inches; weight ± 10 pounds). If two or more adjectives were provided for an appearance descriptor (e.g., short, dark hair), each adjective was scored separately. Free-recall of witnesses' memories for the culprits' actions and appearances was assessed. Therefore, if a witness described the assailant as 'tall', rather than providing a specific measurement, such descriptors were scored as correct/incorrect based on a pre-established acceptable response within the categories.

An independent rater randomly selected and scored 20 description forms. Discrepancies were discussed until a decision was reached on how to code them. This coding process continued until reliability for the descriptor items ranged from 0.8 to 1.

Lineups. The lineups were presented to witnesses in pictorial format. A photo lineup, as opposed to video or live presentation, was chosen for the present research because of the ease of

manipulating the presentation and positions of the lineup members. A lineup consisting of six members was constructed for each culprit. The photographs were colour, head and shoulder views of the culprits and of men who resembled them. Each photo was approximately 3 X 5 inches. The culprits' photo positions were randomly determined across the arrays. Sporer (1993a) discovered that under simultaneous lineup conditions, participants chose the photograph appearing in the fifth position at a rate greater than the others and at rates that differed significantly from chance.

Foils were chosen based on their physical similarity to each of the culprits' physical appearances. In this manner, foils were selected to match the assailant, and foils were selected to match the accomplice. For example, the lineup for the assailant consisted of males with light to medium brown short hair, that were clean shaven, and had a medium build. The foils in the accomplice lineup consisted of photographs of males with dark brown short hair, that were clean shaven, and had a medium to heavy build. The foils were selected by two researchers. Foils for the target-present and –absent lineups were the same. For target-absent lineups, the photos of the culprits were replaced with foils that were similar in appearance.

For the simultaneous and sequential presentation modes, each witness was shown two lineups, one for the assailant and one for the accomplice. The order of lineups was counterbalanced to control for any unwanted order effects. After making the identification decision from each lineup, the witness also was asked to indicate on the response form if the person they selected was the accomplice or assailant. During lineup identification tasks, an attempt was made to control for experimenter bias by standing behind the seated participants so they could not observe unintended body language suggestions.

The *simultaneous lineups* were presented to participants using a numbered place card, from 1 to 6. Witnesses in this condition viewed an accomplice-present or -absent simultaneous lineup and an assailant-present or -absent simultaneous lineup. The photos were placed in two rows of three above their lineup number on a white background. Witnesses were asked to look at the photos and were given the standard admonishment that the culprit may or may not be present in the lineup. They were given as much time as needed and were asked to make an identification by placing a checkmark in the box on the response form that corresponded to the number of the lineup member chosen. The response form also included the answer option 'not here' across both target-absent and target-present lineups for witnesses to choose. If witnesses made a selection from the lineup they were asked to indicate if the person they selected was the accomplice or assailant and to briefly describe this person's role in the crime (see Appendix B). This procedure was repeated for the second culprit's lineup.

The *sequential lineups* consisted of the same photographs used in the simultaneous lineup and the same admonishment. However, the experimenter presented the photos individually to the witnesses from a large stack of photos as to conceal the number of photos to be shown. The response form was larger to ensure that the witnesses had no idea how many photos they would see. This concealment was necessary because it has been demonstrated that false positives increase toward the end of a lineup, if witnesses know how many photos they will see (Lindsay, Lea, & Fulford, 1991). There was an accomplice-present or -absent sequential lineup and an assailant-present or -absent lineup, that were shown to the witnesses in counterbalanced order. The witnesses were given additional instructions that they will be shown one picture at a time and must decide for each whether it is a picture of the culprit. They were told that they could take

as much time as they wanted to decide, but they would only be shown each photograph once. The response form consisted of the question “Is #1 the culprit? No, Yes” for each photograph shown to the witness (see Appendix C). The procedure being outlined here is the standard sequential procedure used by many in the field (e.g., Lindsay & Wells, 1985; Lindsay et al., 1991; Sporer, 1993a). If witnesses’ made an identification, they were asked to indicate if the person they had selected was the assailant or accomplice, and to briefly describe this person’s role in the crime. The experimenter concluded the identification task for each culprit after the six pictures for the first culprit had been seen by the witnesses.

When the sequential lineup procedure is used in research and by law enforcement, questions often arise as to whether or not to end the series of photographs viewed by the witness once the witness has made an identification. One perspective is that by allowing the witness to view the remaining lineup members after making an identification, he/she will revert back to relative judgments (Wells et al., 2000). However, Wells et al. (2000) state that law enforcement have expressed a concern about the situation of a witness selecting a foil before reaching the suspect. Investigators wanted to know the witness’ reaction to later seeing the suspect. From an experimental stand point, it is beneficial for each participant to be exposed to exactly the same photographs and the same number of photographs. Wells et al. (2000) suggest that either the continuation or the stopping of the procedure be permitted, so long as it determined beforehand and not at the time of the witness’ identification. For the present research, witnesses viewed all the photographs in the lineup, whether or not they made a selection from the lineup. Multiple selections were recorded and treated as an error.

The *two-person serial lineup* is a modification of the standard sequential presentation

technique, and accordingly it used the same instructions, the same photographs, and followed the same general format (see Appendix D). Witnesses in this condition were told that they would see a series of two-person lineups. Each pair of photographs of a potential suspect were shown to the witness one at a time. Witnesses were informed that each two-person lineup may or may not contain a picture of either the assailant or accomplice, but that it would not contain both culprits at one time. After viewing the two-person lineup, the witness was asked if either of the photos was of the culprit. If the witness responded 'yes', s/he was asked to place a check mark in the box matching his lineup number and to state which culprit they had identified (assailant or accomplice) and to briefly describe this person's role in the crime. After the witness had made his/her identification decision, another two-person lineup was presented, and so on, until the witness had viewed the six sets of paired photos. The witness was not made aware of how many two-person lineups they were to be presented with, nor were they able to go back in the series and view previously seen lineup photographs or change their identification decisions. Each set of pictures was placed on a place card with a number and letter for each. The assailant and accomplice did not appear together in the same lineup pair, as each culprit was paired with a foil matching his physical appearance. In this way, the six photographs used for the assailant were presented in pairs and interspersed with the three paired sets of accomplice lineup photos. Pairings within each type of lineup (accomplice versus assailant) and the positions of the culprits were randomly determined.

Lastly, the *paired-serial lineup* was presented exactly as the two-person lineup outlined above, however the accomplice and assailant, or foils matching their appearances, were presented together in the pairings. The foils for each culprit were paired such that a foil from the

assailant lineup was paired with a foil from the accomplice lineup. These pairings and the positions of the culprits in the series were randomly determined. Participants were given the same instructions and response form as used in the two-person lineup, except they were not told that the culprits would not appear in the same lineup (see Appendix E).

Procedure

Each testing session was conducted in the laboratory with small groups of one to three adults at a time. Participants were greeted by the experimenter and a general consent form was explained to them at this time (see Appendix F). In an attempt to mimic the unexpected nature of real crime, the participants were not made aware of the true nature of the experiment until they had viewed the staged crime. Participants believed that they were participating in a survey assessing their views on issues related to crime and the justice system. Such deception is necessary and is typical of eyewitness identification research (e.g., Lindsay & Wells, 1985).

After signing the consent form, the experimenter asked the participants to watch the video until she returned from organizing some forms needed for the experiment. After watching the video, the witnesses were told that I was interested in their memory for crime and culprits, and consent was re-established at this time. At this point, they were asked to provide a written description of the crime and the culprits' appearances (see Appendix A). The description form also served as a filler task to allow time to elapse between witnessing and identification. After completing the description form at their own pace, witnesses were presented with one of the eight identification tasks. Participant-witnesses were randomly assigned to one of the following conditions: (1) two target-present simultaneous lineups, (2) two target-present sequential lineups, (3) the target-present two-person serial lineup, (4) the target-present paired-serial lineup (5) two

target-absent simultaneous lineups, (6) two target-absent sequential lineups, (7) the target-absent two-person serial lineup, or (8) the target-absent paired serial lineup ($n = 25$). Participants receiving the simultaneous lineups were asked to make two separate identifications from two separate lineups (one for each culprit involved in the crime). Participants in the sequential condition were asked to make two separate identifications from two sequential control condition lineups (one for each culprit involved in the crime). The remaining participants made identifications from one of the two types of the serial lineups. After completing the identification task, participants were thanked for their time and debriefed (see Appendix G).

Results

Descriptions

Quantity of descriptors reported

The first question posed was whether the quantity of appearance descriptors and the quantity of action descriptors reported by witnesses differed for the assailant and accomplice. A paired samples t-test was used to compare the mean number of assailant appearance descriptors to the mean number of accomplice appearance descriptors. Witnesses reported a greater total amount of appearance descriptors for the assailant ($M = 8.40$, $SD = 3.84$) than for the accomplice ($M = 7.53$, $SD = 3.17$), $t(199) = -5.170$, $p < .001$, $\eta^2 = .19$.

A paired samples t-test also was used to compare the mean number of assailant action descriptors to the mean number of accomplice action descriptors reported by witnesses. Witnesses provided a greater total number of action descriptors for the assailant ($M = 4.32$, $SD = 1.99$) than for the accomplice ($M = 4.10$, $SD = 1.96$), $t(199) = -2.00$, $p < .05$, $\eta^2 = .02$.

Accuracy of descriptors reported

The second question posed addressed whether the accuracy of total appearance and action descriptors reported varied between the assailant and the accomplice. A paired samples t-test was used to assess differences between the proportion of correct appearance descriptors for the assailant and the accomplice. Appearance descriptors for the accomplice were more likely to be accurate ($M = .77$, $SD = .62$) than the appearance descriptors witnesses provided for the assailant ($M = .67$, $SD = .20$), $t(194) = 2.30$, $p < .03$, $\eta^2 = .02$. Thus, although witnesses provided a greater total number of appearance descriptors for the assailant than the accomplice, these descriptors were not more likely to be accurate.

A similar analysis was conducted to assess any differences between the assailant and accomplice in accuracy of action descriptors reported by witnesses. A paired samples t-test was conducted to examine the mean differences in the proportions of correct action descriptors between the culprits. Assailant action descriptors were more likely to be accurate ($M = .86$, $SD = .21$) than the action descriptors provided for the accomplice ($M = .81$, $SD = .24$), $t(197) = -3.07$, $p < .003$, $\eta^2 = .05$.

Identification Accuracy

Target-present lineups

The difference in correct identifications between the two culprits was assessed using McNemar's Test, that is a nonparametric test for two related dichotomous variables to test for changes in responses using a chi-square distribution (Everitt, 1993). When collapsing over lineup procedure, it was found that witnesses were more likely to correctly identify the accomplice (.27) than the assailant (.14), $\chi^2(N = 100)$, $p < .02$.

Assailant identification. A significant difference in correct identifications for the assailant as a function of lineup procedure was not found, $\chi^2 (3, N = 100) = 2.99, ns$. As indexed by Cramer's statistic, the strength of the relationship was .173. As can be seen in Table 3, there was a nonsignificant trend for witnesses to be more accurate with the simultaneous lineup condition.

Accomplice identification. A significant difference in correct identifications of the accomplice as a function of lineup procedure was not found, $\chi^2 (3, N = 100) = 2.99, ns$. As indexed by Cramer's statistic, the strength of the relationship was .173. The rates of correct identifications and foil identifications for the assailant and accomplice as a function of lineup procedure can be found in Table 3.

Table 3. Proportion (*N*) of Correct Identification Decisions for the Assailant and Accomplice as a Function of Lineup Procedure

Lineup Procedure	Accuracy for Assailant		Accuracy for Accomplice	
	Correct	Incorrect	Correct	Incorrect
Simultaneous	.24 (6)	.76 (19)	.40 (10)	.60 (15)
Sequential	.12 (3)	.88 (22)	.20 (5)	.80 (20)
Two-person serial	.12 (3)	.88 (22)	.24 (6)	.76 (19)
Paired-serial	.08 (2)	.92 (23)	.24 (6)	.76 (19)
Total	.14 (14)	.86 (86)	.27 (27)	.73 (73)

Role assignment. Of the 41% ($n = 100$) of witnesses that accurately identified either the assailant or accomplice, accuracy of role assignment was not an issue. Only one witness could not indicate which role the target (accomplice only in this case) played in the crime, citing an inability to remember which “guy did what”. Only 8 of the 100 accurately identified both the assailant and accomplice.

Target-absent lineups

McNemar’s Test was used to calculate differences in the number of correct rejections between the two culprits. When collapsing over lineup procedure, a significant difference in the rates of correct rejections between the assailant and accomplice was not found. Witnesses correctly rejected the assailant-absent lineups (.57) at a similar rate to the accomplice-absent lineups (.54), $\chi^2 (N = 100)$, *ns*.

Assailant lineups. A significant difference in correct rejections of the assailant was not found as a function of lineup procedure, $\chi^2 (3, N = 100) = 5.67$, *ns*. As indexed by Cramer’s statistic, the strength of the relationship was .24.

Accomplice lineups. Confirming expectations, correct rejections of the accomplice-absent lineup occurred more frequently for witnesses receiving the two-person serial lineup versus witnesses in the simultaneous, sequential, or paired-serial lineup conditions, $\chi^2 (3, N = 100) = 6.60$, $p = .086$. The strength of the relationship was .26 using Cramer’s statistic.

Follow-up analyses using separate chi-square tests of independence were conducted to examine these differences in the number of correct rejections. As expected, for the accomplice, the two-person serial lineup was found to be more effective than the simultaneous lineup, $\chi^2 (1,$

$N = 50$), $p < .05$, and the paired-serial lineup, $\chi^2 (1, N = 50)$, $p < .03$. However, contrary to expectations a significant difference in the number of correct rejections was not found between the two-person serial lineup and the sequential lineup, $\chi^2 (1, N = 50)$, *ns*. The rates of correct rejections and false positives for the accomplice as a function of lineup procedure can be found in Table 4.

Finally, as predicted, a significant difference was not found in the number of correct rejections for witnesses viewing the simultaneous or sequential lineups for both the accomplice, $\chi^2 (1, N = 50) = 1.28$, *ns*, and the assailant, $\chi^2 (1, N = 50) = .72$, *ns*.

Table 4. Proportion (N) of Correct Rejections for the Assailant and Accomplice as a Function of Lineup Procedure

Lineup Procedure	Accuracy for Assailant		Accuracy for the Accomplice	
	Correct	Incorrect	Correct	Incorrect
Simultaneous	.56 (14)	.44 (11)	.44 (11)**	.56 (14)
Sequential	.44 (11)	.56 (14)	.60 (15)	.40 (10)
Two-person serial	.76 (19)	.24 (6)	.72 (18)*	.28 (7)
Paired-serial	.52 (13)	.48 (12)	.40 (10)**	.60 (15)
Total	.57 (57)	.43 (43)	.54 (54)	.46 (46)

* significantly different from ** at $p < .05$

Discussion

The present research sought to examine the effect of four lineup procedures (simultaneous, sequential, two-person serial, and paired-serial) on eyewitness identification accuracy in a two culprit crime. The aim of the study was to develop an effective lineup procedure for multiple culprit crimes. The accuracy of witnesses in describing and matching culprits to their actions also was assessed.

When witnesses were shown a target-present lineup, the rate of correct identifications was similar regardless of which lineup procedure was used (i.e., simultaneous, sequential, two-person serial, or paired-serial). This finding is not surprising when one considers that under single culprit crime situations, the simultaneous and sequential lineup have similar rates of correct identifications (Steblay et al., 2001). When a new lineup procedure is proposed it would be undesirable for it to reduce the number of correct identifications.

Problematic, however, is the overall low rate of correct identification (.27 and .14 for the accomplice and assailant, respectively). Eyewitness identification studies with adults involving only one culprit have found larger correct identification rates, where a rate of .80 is not unusual (e.g., Pozzulo & Warren, 2003). The low rate of correct identification in the present study supports past research with more than one culprit where accurate identification decreases as the number of culprits increases (Clifford & Hollin, 1981; Yarmey, 1982). This decrease in the rate of correct identification is likely the result of divided attention at the encoding stage. Previous studies of divided attention at encoding suggest that any secondary task performed during the acquisition stage of a memory task results in a reduced ability of later retrieval of that information (Craig, 2001). Although the research examining divided attention typically asks

participants to perform some secondary task (e. g., mathematical calculations) while attempting to encode word pairs, for instance, it stands to reason that a second culprit at the scene of a crime may divide attention in a similar manner, thus accounting for the low rate of correct identification.

During the identification task, participants frequently remarked on the difficulty of the task. The simultaneous and sequential lineup procedures seemed to create the most questions from participants, in that they were unsure as to which culprit they were attempting to identify from which lineup (as they knew that they would view two separate lineups, one for each culprit, but not which lineup was to contain which culprit). Multiple culprit identification tasks are much more complex for participants. Future research may wish to include a condition with one culprit, thereby enabling a direct comparison of single versus multiple culprit identification tasks with the same confederates.

Contrary to expectations, the accomplice was identified more readily by witnesses than the assailant. This finding corresponds with results from a similar research endeavour by Geiselman et al. (1993). In fact, Geiselman et al. (1993) reported very similar correct identification rates for the accomplice (.30) and the assailant (.10) to the present study. However, the finding that the accomplice was more readily identified than the assailant operates in contrast to previous research that has found that participants are more likely to recognize individuals who play central, as opposed to peripheral, roles in an event (Christianson, & Loftus, 1987). Thus, there may have been something specific about the choreography of the crime events which may have afforded participants a better view of the accomplice, perhaps. Although, a clear, close-up view of both culprits was presented to witnesses at the beginning of the crime video. When the

victim appeared, the assailant lurked in the background while the accomplice operated in the foreground to distract the victim. In hindsight, the accomplice played a much more active and attention stealing role than the assailant. Attorneys may do well to consider how the witness' viewing conditions for the crime could have affected eyewitness performance, and not simply the centrality of the culprit's role in determining the importance of an eyewitness' testimony at trial.

The findings from the appearance descriptions provided by witnesses further explains the identification decision findings. Participants were more likely to describe the actions and physical appearance of the assailant, yet they were almost three times more likely to recognize and accurately identify the accomplice than the assailant. Perhaps there was a bias for participants to label innocent foils in the lineup as the assailant, as this appears to be the most salient role. Although participants were more likely to write about the appearance and actions of the assailant than the accomplice, the analyses revealed that they were actually more accurate in describing the appearance of the accomplice than the assailant. Perhaps these errors for the assailant involved some amount of transference for certain details. For example, one participant described the assailant as wearing a red jersey, when it was actually the accomplice who wore a red shirt. Others occasionally described the assailant as both asking for directions to the library and snatching the purse, when in reality it was the accomplice who distracted the victim by asking for directions. However, without the appropriate analyses, this is only speculation. Remember too, that no evidence of role transference was found through the identification decisions. It would be beneficial for future research to systematically examine the cause for the types of errors in action and appearance descriptions in multiple culprit crimes.

Accordingly, the present research finds no support for unconscious transference under

multiple culprit identification scenarios. This lack of support may be due to the low rate of correct identifications, considering that only 8% of participants correctly identified both culprits. No one completely reversed the roles of the two culprits. These results lend support to previous research by Geiselman et al. (1996) who also found a low rate of correct identifications on both lineups and no evidence for unconscious transference.

Under target-absent conditions, participants were not more likely to correctly reject accomplice-absent lineups than assailant-absent lineups. This pattern of results is different from target-present lineup conditions where accuracy was greater for the accomplice than the assailant. These findings may lend further support to the notion espoused by Pozzulo and colleagues (1999; 2003) that correct identification decisions are driven by distinctly different processes than correct rejections.

Overall, there was a non-significant difference in the rate of correct rejections for the accomplice and the assailant across the four lineup procedures. This finding is discouraging given the purpose of the study was to examine the serial lineup in an attempt to develop a superior lineup procedure. It appears that the two-person serial lineup was beginning to approach significance for the accomplice, but it is difficult to understand why this was not also the case for the assailant. Perhaps with a larger sample size, the trend would have reached significance.

These results may relate back to the findings from the descriptor data. Although the assailant's role seems to be more salient for witnesses, the accomplice may have somehow been more memorable. Thus, witnesses were more likely to reject the lineups not containing the accomplice, but this was more difficult to do for the assailant. Witnesses may have felt more

pressure to indicate that they could identify the assailant because of the role he played and the quantity of attention he was afforded in their descriptions. Witnesses may recognize that the police would be most interested in obtaining information and an identification about the key culprit at the scene of the crime, rather than a peripheral figure. As a result, witnesses may have imagined greater social demand to identify the assailant.

The paired-serial lineup procedure was included to explore the possibility of context effects under the principle of encoding specificity, in that the accomplice and assailant provide a context for each other, thus enhancing correct identifications and correct rejections. This was not the case. The paired-serial lineup procedure generally had the lowest rates of correct rejections. Some may question why the two-person serial and paired-serial lineup did not have similar results. The difference may lie in the judgment strategies being used by witnesses. It was expected that the two-person serial lineup would force witnesses to combine relative and absolute judgment strategies. Recall that Steblay et al. (2001) found that the sequential superiority effect was removed under target-absent conditions in multiple culprit identification tasks. Therefore, it was hypothesized that a strict absolute judgment strategy was not as effective under these conditions. The two-person serial lineup can be conceptualized as a two-person sequential lineup that allows an initial relative judgment, but also forces witnesses to consider that the culprit is yet to appear in the series. Although the findings for target-absent lineups did not reach significance, it is encouraging to see the trend for an increase in correct rejections with the two-person serial lineup. To uncover the benefits or disadvantages of the two-person serial lineup, it would be useful for future research to include a think-aloud protocol to examine what judgment strategies witnesses are using during the identification task.

Limitations and Future Directions

A limitation to the present study concerns the terms used to describe the culprits. Multiple culprit crimes are complex enough for witnesses without having to add the encumbrances of language. Throughout the description and identification tasks, the culprits were referred to as 'the assailant' and 'the accomplice'. These terms seemed to confuse a large proportion of participants. In the future, the description form should ask the participants to describe the 'purse-snatcher' or 'thief', and then to describe the 'other male present at the scene of the crime'. However, this may not be realistic for law enforcement under real life conditions where the roles of the culprits may still be unclear or unknown to the police. Including definitions of the terms on the response forms may be more helpful also.

Similarly, during the identification task, witnesses who made an identification were asked to indicate if they had identified the assailant or the accomplice and then to describe that person's role in the crime. The response forms should be revised to have witnesses briefly describe the actions of the person they have identified, instead of forcing witnesses to select a label for each culprit. In this way, language misunderstandings will be avoided completely. It is unclear what impact this confusion had on witnesses' responses.

A second methodological criticism also relates to the description aspect of the study. Although during the identification task, the order of the culprits was counterbalanced to control for any unwanted order effects, this was not the case during the description phase of the study. The nature of the results pertaining to the quantity and accuracy of the descriptors provided may change, if this was incorporated.

Future research may wish to create a delay between the description and identification

tasks. Witnesses to crimes in the real world are seldom asked to describe and then immediately attempt lineup identification. In the present study, approximately 30 minutes elapsed between the time the witnesses saw the crime and then described the events, to the time they viewed the lineups. This condensed time period is highly unrealistic.

It would be useful for future research to replicate and extend the current study, perhaps with a larger sample size. It would be important to determine if the trend for the two-person serial lineup to yield a higher proportion of correct rejections for the accomplice can be replicated, and then perhaps extended to the assailant. Until then, it is difficult to recommend the use of the two-person serial lineup. It is promising to be able to develop and test new lineup procedures for multiple culprit crimes, such as the two-person serial lineup. From an applied perspective, it would be useful to have a uniform set of guidelines in place for such situations. Especially one that promotes an increased number of correct rejections without a decrease in correct identifications.

Finally, future studies may be directed at discerning the nature of the errors in appearance and action descriptors for multiple culprit crimes. The preference for witnesses to describe the assailant over the accomplice and their inaccuracy of the appearance descriptor for the assailant may provide new insight on how witnesses attend to and process crimes and events. Descriptions are a useful and important first step that police need to create composites, create lineups, and generally narrow the search for viable suspects to a crime.

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Appendix A

Description Form

Age: _____
Sex: _____

Please write down everything you can remember about the crime.

Please describe the actions of the assailant.

Please describe the actions of the accomplice.

Please write down everything you can remember about the assailant's appearance.

Please write down everything you can remember about the accomplice's appearance.

If you need extra space, please use the back of this form.

Appendix B

Simultaneous Lineup Response Form #1

Instructions: You will be shown a separate lineup for each culprit involved in the crime (the accomplice and assailant will not appear together in the same lineup). The culprits may or may not be present in the lineups. If you see the culprit place a '✓' in the box corresponding to his lineup number. If you do not see the culprit, place a '✓' in the box marked 'not here'.

☐

1

☐

2

☐

3

☐

4

☐

5

☐

6

☐

Not Here

If you made an identification:

Please indicate (✓) if the person you selected was: ____ the assailant ____ the accomplice

Briefly describe this person's role in the crime:

Simultaneous Lineup Response Form #2

Instructions: You will be shown a separate lineup for each culprit involved in the crime (the accomplice and assailant will not appear together in the same lineup). The culprit may or may not be present in the lineup. If you see the culprit place a '✓' in the box corresponding to his lineup number. If you do not see the culprit, place a '✓' in the box marked 'not here'.

☐**1**☐**2**☐**3**☐**4**☐**5**☐**6**☐**Not Here**

If you made an identification:

Please indicate (✓) if the person you selected was: ____ the assailant ____ the accomplice

Briefly describe this person's role in the crime:

Appendix C

Sequential Lineup Response Form #1

Instructions: You will be shown a separate lineup for each culprit involved in the crime (the accomplice and the assailant will not appear in the same lineup). The culprit may or may not be present in the lineup. When you are shown each photo you must decide if it is or is not the culprit. If it is the culprit, place a '✓' in the box marked 'YES'. If it is not the culprit, place a '✓' in the box marked 'NO'. You will not be able to see a photo more than once, so take your time when examining each photo and deciding on an answer. If you make an identification, please briefly describe this person's role in the crime.

**IS PHOTO 1 THE
CULPRIT?**

☐☐

YES

NO

Please indicate (✓) if the person you selected was: ____ the assailant ____ the accomplice

**IS PHOTO 2 THE
CULPRIT?**

☐☐

YES

NO

Please indicate (✓) if the person you selected was: ____ the assailant ____ the accomplice

**IS PHOTO 3 THE
CULPRIT?**

☐☐

YES

NO

Please indicate (✓) if the person you selected was: ____ the assailant ____ the accomplice

**IS PHOTO 4 THE
CULPRIT?**

☐☐

YES

NO

Please indicate (✓) if the person you selected was: ____ the assailant ____ the accomplice

Sequential Lineup Response Form #1 (cont'd)

Instructions: You will be shown a separate lineup for each culprit involved in the crime (the accomplice and the assailant will not appear in the same lineup). The culprit may or may not be present in the lineup. When you are shown each photo you must decide if it is or is not the culprit. If it is the culprit, place a '✓' in the box marked 'YES'. If it is not the culprit, place a '✓' in the box marked 'NO'. You will not be able to see a photo more than once, so take your time when examining each photo and deciding on an answer. If you make an identification, please briefly describe this person's role in the crime.

**IS PHOTO 5 THE
CULPRIT?**

☐
☐

YES

NO

Please indicate (✓) if the person you selected was: ____ the assailant ____ the accomplice

**IS PHOTO 6 THE
CULPRIT?**

☐
☐

YES

NO

Please indicate (✓) if the person you selected was: ____ the assailant ____ the accomplice

**IS PHOTO 7 THE
CULPRIT?**

☐
☐

YES

NO

Please indicate (✓) if the person you selected was: ____ the assailant ____ the accomplice

**IS PHOTO 8 THE
CULPRIT?**

☐
☐

YES

NO

Please indicate (✓) if the person you selected was: ____ the assailant ____ the accomplice

Sequential Lineup Response Form #1 (cont'd)

Instructions: You will be shown a separate lineup for each culprit involved in the crime (the accomplice and the assailant will not appear in the same lineup). The culprit may or may not be present in the lineup. When you are shown each photo you must decide if it is or is not the culprit. If it is the culprit, place a '✓' in the box marked 'YES'. If it is not the culprit, place a '✓' in the box marked 'NO'. You will not be able to see a photo more than once, so take your time when examining each photo and deciding on an answer. If you make an identification, please briefly describe this person's role in the crime.

**IS PHOTO 9 THE
CULPRIT?**

☐
☐

YES

NO

Please indicate (✓) if the person you selected was: ____ the assailant ____ the accomplice

**IS PHOTO 10 THE
CULPRIT?**

☐
☐

YES

NO

Please indicate (✓) if the person you selected was: ____ the assailant ____ the accomplice

**IS PHOTO 11 THE
CULPRIT?**

☐
☐

YES

NO

Please indicate (✓) if the person you selected was: ____ the assailant ____ the accomplice

**IS PHOTO 12 THE
CULPRIT?**

☐
☐

YES

NO

Please indicate (✓) if the person you selected was: ____ the assailant ____ the accomplice

Sequential Lineup Response Form #2

Instructions: You will be shown a separate lineup for each culprit involved in the crime (the accomplice and the assailant will not appear in the same lineup). The culprit may or may not be present in the lineup. When you are shown each photo you must decide if it is or is not the culprit. If it is the culprit, place a '✓' in the box marked 'YES'. If it is not the culprit, place a '✓' in the box marked 'NO'. You will not be able to see a photo more than once, so take your time when examining each photo and deciding on an answer. If you make an identification, please briefly describe this person's role in the crime.

**IS PHOTO 1 THE
CULPRIT?**

☐☐

YES

NO

Please indicate (✓) if the person you selected was: ____ the assailant ____ the accomplice

**IS PHOTO 2 THE
CULPRIT?**

☐☐

YES

NO

Please indicate (✓) if the person you selected was: ____ the assailant ____ the accomplice

**IS PHOTO 3 THE
CULPRIT?**

☐☐

YES

NO

Please indicate (✓) if the person you selected was: ____ the assailant ____ the accomplice

**IS PHOTO 4 THE
CULPRIT?**

☐☐

YES

NO

Please indicate (✓) if the person you selected was: ____ the assailant ____ the accomplice

Sequential Lineup Response Form #2 (cont'd)

Instructions: You will be shown a separate lineup for each culprit involved in the crime (the accomplice and the assailant will not appear in the same lineup). The culprit may or may not be present in the lineup. When you are shown each photo you must decide if it is or is not the culprit. If it is the culprit, place a '✓' in the box marked 'YES'. If it is not the culprit, place a '✓' in the box marked 'NO'. You will not be able to see a photo more than once, so take your time when examining each photo and deciding on an answer. If you make an identification, please briefly describe this person's role in the crime.

**IS PHOTO 5 THE
CULPRIT?**

☐
☐

YES

NO

Please indicate (✓) if the person you selected was: ____ the assailant ____ the accomplice

**IS PHOTO 6 THE
CULPRIT?**

☐
☐

YES

NO

Please indicate (✓) if the person you selected was: ____ the assailant ____ the accomplice

**IS PHOTO 7 THE
CULPRIT?**

☐
☐

YES

NO

Please indicate (✓) if the person you selected was: ____ the assailant ____ the accomplice

**IS PHOTO 8 THE
CULPRIT?**

☐
☐

YES

NO

Please indicate (✓) if the person you selected was: ____ the assailant ____ the accomplice

Sequential Lineup Response Form #2 (cont'd)

Instructions: You will be shown a separate lineup for each culprit involved in the crime (the accomplice and the assailant will not appear in the same lineup). The culprit may or may not be present in the lineup. When you are shown each photo you must decide if it is or is not the culprit. If it is the culprit, place a '✓' in the box marked 'YES'. If it is not the culprit, place a '✓' in the box marked 'NO'. You will not be able to see a photo more than once, so take your time when examining each photo and deciding on an answer. If you make an identification, please briefly describe this person's role in the crime.

**IS PHOTO 9 THE
CULPRIT?**

☐
☐

YES

NO

Please indicate (✓) if the person you selected was: ____ the assailant ____ the accomplice

**IS PHOTO 10 THE
CULPRIT?**

☐
☐

YES

NO

Please indicate (✓) if the person you selected was: ____ the assailant ____ the accomplice

**IS PHOTO 11 THE
CULPRIT?**

☐
☐

YES

NO

Please indicate (✓) if the person you selected was: ____ the assailant ____ the accomplice

**IS PHOTO 12 THE
CULPRIT?**

☐
☐

YES

NO

Please indicate (✓) if the person you selected was: ____ the assailant ____ the accomplice

Appendix D

Two-Person-Serial Lineup Response Form #1

Instructions: A series of two-person lineups will be shown to you one at a time. The accomplice and the assailant will not appear together in the same lineup. The culprit may or may not be present in the lineup. If you see the culprit place a '✓' in the box corresponding to his lineup number. If you do not see the culprit, place a '✓' in the box marked 'not here'. You will not be able to see a photo more than once, so take your time when examining each photo and deciding on an answer. If you make an identification, please indicate if you have identified the accomplice or the assailant and briefly describe this person's role in the crime.

1A

1B

NOT HERE

If you made an identification:

Please indicate (✓) if the person you selected was: ____ the assailant ____ the accomplice

Briefly describe this person's role in the crime:

Two-Person-Serial Lineup Response Form #2

Instructions: A series of two-person lineups will be shown to you one at a time. The accomplice and the assailant will not appear together in the same lineup. The culprit may or may not be present in the lineup. If you see the culprit place a '✓' in the box corresponding to his lineup number. If you do not see the culprit, place a '✓' in the box marked 'not here'. You will not be able to see a photo more than once, so take your time when examining each photo and deciding on an answer. If you make an identification, please indicate if you have identified the accomplice or the assailant and briefly describe this person's role in the crime.

2A

2B

NOT HERE

If you made an identification:

Please indicate (✓) if the person you selected was: ____ the assailant ____ the accomplice

Briefly describe this person's role in the crime:

Two-Person-Serial Lineup Response Form #3

Instructions: A series of two-person lineups will be shown to you one at a time. The accomplice and the assailant will not appear together in the same lineup. The culprit may or may not be present in the lineup. If you see the culprit place a '✓' in the box corresponding to his lineup number. If you do not see the culprit, place a '✓' in the box marked 'not here'. You will not be able to see a photo more than once, so take your time when examining each photo and deciding on an answer. If you make an identification, please indicate if you have identified the accomplice or the assailant and briefly describe this person's role in the crime.

3A

3B

NOT HERE

If you made an identification:

Please indicate (✓) if the person you selected was: ___ the assailant ___ the accomplice

Briefly describe this person's role in the crime:

Two-Person-Serial Lineup Response Form #4

Instructions: A series of two-person lineups will be shown to you one at a time. The accomplice and the assailant will not appear together in the same lineup. The culprit may or may not be present in the lineup. If you see the culprit place a '✓' in the box corresponding to his lineup number. If you do not see the culprit, place a '✓' in the box marked 'not here'. You will not be able to see a photo more than once, so take your time when examining each photo and deciding on an answer. If you make an identification, please indicate if you have identified the accomplice or the assailant and briefly describe this person's role in the crime.

4A

4B

NOT HERE

If you made an identification:

Please indicate (✓) if the person you selected was: ____ the assailant ____ the accomplice

Briefly describe this person's role in the crime:

Two-Person-Serial Lineup Response Form #5

Instructions: A series of two-person lineups will be shown to you one at a time. The accomplice and the assailant will not appear together in the same lineup. The culprit may or may not be present in the lineup. If you see the culprit place a '✓' in the box corresponding to his lineup number. If you do not see the culprit, place a '✓' in the box marked 'not here'. You will not be able to see a photo more than once, so take your time when examining each photo and deciding on an answer. If you make an identification, please indicate if you have identified the accomplice or the assailant and briefly describe this person's role in the crime.

5A

5B

NOT HERE

If you made an identification:

Please indicate (✓) if the person you selected was: ____ the assailant ____ the accomplice

Briefly describe this person's role in the crime:

Two-Person-Serial Lineup Response Form #6

Instructions: A series of two-person lineups will be shown to you one at a time. The accomplice and the assailant will not appear together in the same lineup. The culprit may or may not be present in the lineup. If you see the culprit place a '✓' in the box corresponding to his lineup number. If you do not see the culprit, place a '✓' in the box marked 'not here'. You will not be able to see a photo more than once, so take your time when examining each photo and deciding on an answer. If you make an identification, please indicate if you have identified the accomplice or the assailant and briefly describe this person's role in the crime.

6A

6B

NOT HERE

If you made an identification:

Please indicate (✓) if the person you selected was: ____ the assailant ____ the accomplice

Briefly describe this person's role in the crime:

Two-Person-Serial Lineup Response Form #7

Instructions: A series of two-person lineups will be shown to you one at a time. The accomplice and the assailant will not appear together in the same lineup. The culprit may or may not be present in the lineup. If you see the culprit place a '✓' in the box corresponding to his lineup number. If you do not see the culprit, place a '✓' in the box marked 'not here'. You will not be able to see a photo more than once, so take your time when examining each photo and deciding on an answer. If you make an identification, please indicate if you have identified the accomplice or the assailant and briefly describe this person's role in the crime.

7A

7B

NOT HERE

If you made an identification:

Please indicate (✓) if the person you selected was: ____ the assailant ____ the accomplice

Briefly describe this person's role in the crime:

Appendix E

Paired Serial Lineup Response Form #1

Instructions: A series of two-person lineups will be shown to you one at a time. The culprit may or may not be present in the lineup. If you see the culprit place a '✓' in the box corresponding to his lineup number. If you do not see the culprit, place a '✓' in the box marked 'not here'. You will not be able to see a photo more than once, so take your time when examining each photo and deciding on an answer. If you make an identification, please indicate if you have identified the accomplice or the assailant and briefly describe this person's role in the crime.

1A

1B

NOT HERE

If you made an identification:

Please indicate (✓) if the person you selected was: ____ the assailant ____ the accomplice

Briefly describe this person's role in the crime:

Paired Serial Lineup Response Form #2

Instructions: A series of two-person lineups will be shown to you one at a time. The culprit may or may not be present in the lineup. If you see the culprit place a '✓' in the box corresponding to his lineup number. If you do not see the culprit, place a '✓' in the box marked 'not here'. You will not be able to see a photo more than once, so take your time when examining each photo and deciding on an answer. If you make an identification, please indicate if you have identified the accomplice or the assailant and briefly describe this person's role in the crime.

2A

2B

NOT HERE

If you made an identification:

Please indicate (✓) if the person you selected was: ____ the assailant ____ the accomplice

Briefly describe this person's role in the crime:

Paired Serial Lineup Response Form #3

Instructions: A series of two-person lineups will be shown to you one at a time. The culprit may or may not be present in the lineup. If you see the culprit place a '✓' in the box corresponding to his lineup number. If you do not see the culprit, place a '✓' in the box marked 'not here'. You will not be able to see a photo more than once, so take your time when examining each photo and deciding on an answer. If you make an identification, please indicate if you have identified the accomplice or the assailant and briefly describe this person's role in the crime.

3A

3B

NOT HERE

If you made an identification:

Please indicate (✓) if the person you selected was: ____ the assailant ____ the accomplice

Briefly describe this person's role in the crime:

Paired Serial Lineup Response Form #4

Instructions: A series of two-person lineups will be shown to you one at a time. The culprit may or may not be present in the lineup. If you see the culprit place a '✓' in the box corresponding to his lineup number. If you do not see the culprit, place a '✓' in the box marked 'not here'. You will not be able to see a photo more than once, so take your time when examining each photo and deciding on an answer. If you make an identification, please indicate if you have identified the accomplice or the assailant and briefly describe this person's role in the crime.

4A

4B

NOT HERE

If you made an identification:

Please indicate (✓) if the person you selected was: ____ the assailant ____ the accomplice

Briefly describe this person's role in the crime:

Paired Serial Lineup Response Form #5

Instructions: A series of two-person lineups will be shown to you one at a time. The culprit may or may not be present in the lineup. If you see the culprit place a '✓' in the box corresponding to his lineup number. If you do not see the culprit, place a '✓' in the box marked 'not here'. You will not be able to see a photo more than once, so take your time when examining each photo and deciding on an answer. If you make an identification, please indicate if you have identified the accomplice or the assailant and briefly describe this person's role in the crime.

5A

5B

NOT HERE

If you made an identification:

Please indicate (✓) if the person you selected was: ____ the assailant ____ the accomplice

Briefly describe this person's role in the crime:

Paired Serial Lineup Response Form #6

Instructions: A series of two-person lineups will be shown to you one at a time. The culprit may or may not be present in the lineup. If you see the culprit place a '✓' in the box corresponding to his lineup number. If you do not see the culprit, place a '✓' in the box marked 'not here'. You will not be able to see a photo more than once, so take your time when examining each photo and deciding on an answer. If you make an identification, please indicate if you have identified the accomplice or the assailant and briefly describe this person's role in the crime.

6A

6B

NOT HERE

If you made an identification:

Please indicate (✓) if the person you selected was: ____ the assailant ____ the accomplice

Briefly describe this person's role in the crime:

Paired Serial Lineup Response Form #7

Instructions: A series of two-person lineups will be shown to you one at a time. The culprit may or may not be present in the lineup. If you see the culprit place a '✓' in the box corresponding to his lineup number. If you do not see the culprit, place a '✓' in the box marked 'not here'. You will not be able to see a photo more than once, so take your time when examining each photo and deciding on an answer. If you make an identification, please indicate if you have identified the accomplice or the assailant and briefly describe this person's role in the crime.

7A

7B

NOT HERE

If you made an identification:

Please indicate (✓) if the person you selected was: ____ the assailant ____ the accomplice

Briefly describe this person's role in the crime: