Journal of Applied Psychology
1999, Vol. 84, No. 6, 940–951

0021-9010/99/$3.00

Double-Blind Photoarray Administration as a Safeguard Against Investigator Bias

Mark R. Phillips, Bradley D. McAuliff, Margaret Bull Kovera, and Brian L. Cutler
Florida International University

This experiment examined whether a photoarray administrator's knowledge of a suspect's identity increased false identification rates. Fifty participant-administrators (PAs) presented 50 participant-witnesses (PWs) two perpetrator-absent photoarrays following a live staged crime involving two perpetrators. For one photoarray per trial, the experimenter revealed the suspect's identity to the PA. Each PA presented the photoarrays sequentially or simultaneously in the presence or absence of an observer. When the observer was present, PA knowledge of the suspect's identity had a biasing effect in sequential photoarrays only. This pattern did not emerge when the observer was absent. The experimental manipulations did not affect PAs' and PWs' ratings of photoarray fairness or PWs' ratings of pressure to make an identification. These data suggest that only administrators who are blind to the suspect's identity should present sequential photoarrays.

> The vagaries of eyewitness identification are well-known. . . . A major factor contributing to the high incidence of miscarriage of justice from mistaken identification has been the degree of suggestion inherent in the manner in which the prosecution presents the suspect to witnesses for pretrial identification. . . . Suggestion can be created intentionally or unintentionally in many subtle ways.
>
> —Supreme Court Justice William Brennan, writing for the majority in *United States v. Wade* (1967)

In the excerpt above, Justice Brennan made reference to biased eyewitness identification procedures, including lineups in which an eyewitness is asked to identify a possible criminal perpetrator embedded among a group of distractors. Legal psychologists have long recognized the potential for bias in such a procedure, which has made eyewitness identification one of the most-studied and best-understood areas in all of applied psychology (Wells et al., 1998). In an effort to provide researchers with a framework for studying eyewitness identification, Wells and Luus (1990; also see Doob & Kirshenbaum, 1973) drew an analogy between a methodologically sound social psychology experiment and a properly conducted lineup. This lineup-as-experiment analogy includes numerous comparisons between the various components of a lineup and the corresponding elements of a psychological experiment. For example, Wells and Luus likened the police officer conducting the lineup to an experimenter and the eyewitnesses to experimental participants. The instructions given to the eyewitnesses are analogous to an experimenter's protocol. The police's suspect in a lineup is equivalent to a stimulus, and the selection, positioning, presentation, and characteristics (e.g., clothing) of the suspect and other lineup members are part of the experimental design. The police officer administering the lineup has a hypothesis (e.g., that a certain lineup member is the guilty culprit) that is to be tested using a specific design, protocol, and procedure. Finally, Wells and Luus argued that an eyewitness's choice was like experimental data, which is then used to evaluate the lineup administrator's hypothesis by other police officials and by the attorneys, judges, and jurors involved in the case.

Wells and Luus (1990) further noted that experimental social psychologists have a somewhat unique awareness and understanding of the numerous variables that can create problems with the validity and reliability of experimental results. Examples of these variables include demand characteristics, experimenter effects, lack of proper control groups, and any number of possible biases or confounding variables. When present in a lineup, these same variables can often lead to less valid, less reliable results, just as they

Mark R. Phillips, Bradley D. McAuliff, Margaret Bull Kovera, and Brian L. Cutler, Department of Psychology, Florida International University.

Portions of this research were presented at the 1998 biennial meeting of the American Psychology–Law Society, Redondo Beach, California.

We would like to thank Lourdes Gomez and Jonathan Beitler for serving as the perpetrators in our crime simulation. We are also grateful to Gary Wells for his helpful suggestions on this research.

Correspondence concerning this article should be addressed to Mark R. Phillips, Department of Psychology, Florida International University, North Miami, Florida 33181-3600. Electronic mail may be sent to mphill02@fiu.edu.

would in an experiment. Following this line of reasoning, Wells and Luus used the lineup-as-experiment analogy as a framework for a set of research-based recommendations for properly conducted lineups. For example, they suggested that eyewitnesses should never be told that the actual perpetrator is in a lineup (to avoid potential demand characteristics). Wells and Luus also suggested that the officer administering the lineup should not be aware of which lineup member is the suspect, just as experimenters who interact with participants should be kept blind to each participant's experimental condition.

Several other published sets of recommendations for properly conducted lineups have emerged from Wells and Luus's (1990) lineup-as-experiment framework (e.g., Wells & Seelau, 1995; Wells, Seelau, Rydell, & Luus, 1994). Although each set has varied slightly from the others, they all have included a recommendation that lineup administrators should be kept blind to the suspect's identity. For example, Wells et al. (1998) most recently recommended that double-blind testing should be used (i.e., that both the eyewitness and the lineup administrator should be kept blind to the identity of the suspect). Wells and colleagues also suggested that an eyewitness should be warned that the actual perpetrator may not be present in the lineup, that foils should be selected to match the witness's prior description of the culprit, and that the eyewitness's confidence should be measured and recorded immediately after any identification is made. The authors described numerous empirical studies supporting the use of the latter three recommendations but noted a paucity of research investigating the potential benefits of double-blind identification tests.

Rationale for the Recommended Use of Double-Blind Photoarray Administration

Investigator Bias

The recommended use of double-blind lineup testing stems from an effort to avoid a specific form of bias known as investigator bias (Cutler & Penrod, 1995) that may be present in some lineup administrations. Investigator bias is present when a lineup administrator knows the suspect's identity and, as a result, intentionally or unintentionally sends cues to an eyewitness that unfairly enhance the likelihood that the witness will identify the suspect. In addition, an eyewitness may be unaware that these cues are influencing his or her identification decision or even that the cues are being sent. These cues can consist of a variety of verbal or nonverbal behaviors. Examples include verbal statements made by an investigator that direct the focus of a witness toward a particular lineup member (e.g., "What about this picture over here?") or that encourage the witness to reconsider his or her tentative identification decision (e.g., "Take another look and make sure he's the one."). Nonverbal cues may include various facial gestures (e.g., smiling, frowning, or rolling the eyes) or body movements (e.g., nodding of the head, shaking the head back and forth, folding the arms, or leaning toward or even away from the witness). In addition to these behavioral cues, a lineup administrator may alter the procedural aspects of the lineup on the basis of his or her knowledge of the suspect's identity. Examples of such alterations include failing to instruct the eyewitness that the perpetrator may not be present in the lineup or constructing a lineup in which the physical appearances of the distractors do not match the suspect's appearance. These procedural alterations can be a source of bias because they may increase the likelihood of a false identification (i.e., a misidentification of an innocent suspect; Wells, 1993).

Several real-life examples of investigator bias in a photo identification procedure can be found in the case of Howard Haupt (see Loftus & Ketcham, 1991, pp. 171–173). Haupt was accused of kidnapping and murdering a young boy in Nevada in 1988. A man who had previously seen the perpetrator later identified Haupt as the culprit in a photo lineup administration that was tape-recorded and later transcribed. In that lineup, a police officer asked the eyewitness to go through a series of pictures, one at a time, to see if any of the lineup members was the criminal. Upon viewing the pictures, the witness initially told the lineup administrator that Haupt appeared to be "too old" and that the glasses Haupt was wearing were not consistent with the glasses worn by the perpetrator. At one point in the lineup administration, the eyewitness specifically told the officer that he couldn't "tell [whether Haupt was the culprit] from this photo" (referring to Haupt's photo). Despite the eyewitness's obvious doubts, the lineup administrator responded by referring to Haupt's photo and saying, "Well, other than that? I mean, is it *similar* [to the perpetrator; italics added]?" Eventually the witness responded, "I'd say Number 3 [Haupt's photo] would be the *closest*" (italics added).

The lineup administrator then ended the lineup administration under the assumption that the witness had positively identified Haupt as the culprit. The officer also made a total of nine separate references to Haupt's photo (Number 3 in the lineup), actually saying the words "Number 3" eight of those nine times. However, he referred to photo Number 6 (which the witness had previously stated was similar to the actual culprit) only three times, and he never mentioned any of the other lineup members at all.

There are numerous instances of investigator bias in this case. For example, the officer failed to end the lineup after the eyewitness repeatedly stated that he could not make a positive identification. In fact, the officer did not end the lineup until his hypothesis was confirmed (i.e., that Haupt was the culprit). If this lineup had been an experiment, waiting to end an experimental trial until the experimenter's

hypothesis was confirmed would be considered an egregious violation of good research practice. In addition, each of the lineup administrator's nine references to Photo Number 3 refocused the eyewitness's attention directly and exclusively on Haupt's photo. Mentioning one lineup member repeatedly in this manner, even after the witness explicitly stated that he could not make a positive identification, is an example of investigator bias because it suggests that the witness should focus more attention on one particular photo (the suspect's) than on any of the others. This form of investigator bias is comparable to focusing an experimental participant's attention on the one stimulus that, if chosen by the participant, would confirm the experimenter's hypothesis.

Another instance of investigator bias may have occurred in the Haupt case when the officer conducting the lineup explicitly asked the eyewitness to make a relative judgment (i.e., to identify the lineup member who *most resembled* the actual culprit). Relative judgment processes have been shown to significantly increase the probability of a false identification in lineups that are perpetrator-absent (see Cutler & Penrod, 1988; Lindsay & Wells, 1985; Wells, 1984; Wells, 1993). Wells and colleagues (Lindsay & Wells, 1985; Wells, 1984, 1993) suggested that it would instead be preferable to make an absolute judgment by first deciding whether the culprit is present and, if so, to identify the actual culprit as opposed to the lineup member who most resembles the culprit.

Behavioral Evidence

In addition to such anecdotal evidence of investigator bias, further justification for the recommended use of double-blind testing in lineups comes from research conducted by Buckhout (1974), Fanselow (1975; Fanselow & Buckhout, 1976), and others (e.g., Buckhout, Figueroa, & Hoff, 1975). This research demonstrated that a lineup administrator who uses nonverbal cues (e.g., smiling, nodding, making eye contact with the witness, tilting the suspect's photo at a slight angle, or leaning forward when presenting an innocent suspect's photo) can increase the probability that the suspect is falsely identified by the witness. Note that this evidence, although compelling, only indirectly supports the recommended use of double-blind lineup administrations. That is, although the behaviors displayed by the lineup administrators in Fanselow and Buckhout's research may increase the rate of false identification, these findings do not demonstrate that an administrator's mere knowledge of the suspect's identity will have similar results.

Nevertheless, the key question we asked in the present experiment was not whether such biased behaviors are present in certain lineup administrations per se. Rather, we asked whether eyewitnesses who are given a perpetrator-absent photoarray tend to falsely identify the suspect more often when the photoarray administrator knows which lineup member is the suspect than when the administrator has no such knowledge. If the answer to this question were yes, then we would have strong empirical justification for the recommended use of double-blind lineup testing. At the present time, however, no published empirical studies have demonstrated that a lineup administrator's awareness of the suspect's identity in a lineup can, in and of itself, result in investigator bias. Hence, advocates of the use of double-blind lineup procedures have turned to evidence from the social psychological research literature to illustrate the need for this procedure.

Experimenter Expectancy Effects

Perhaps the strongest basis for the recommendation that lineup administrators be kept blind to the identity of the suspect has been the extensive literature on experimenter expectancy effects (e.g., see Rosenberg, 1969; Rosenthal, 1976; Rosenthal & Rosnow, 1991). Experimenter expectancy effects are present when experimenters who are not kept blind to the experimental hypotheses interact with participants and emit verbal and nonverbal cues that enhance the likelihood that the experimenter's hypotheses will be confirmed. Wells and others (e.g., Doob & Kirshenbaum, 1973; Wells & Seelau, 1995; Wells et al., 1994; Wells et al., 1998) reasoned that lineup administrators who know the identity of the suspect might emit similar unintentional (or intentional) cues that can increase the likelihood that the witness will identify the suspect as the culprit, thereby supporting the hypothesis of the lineup administrator.

Demand Characteristics

In addition to experimenter expectancy effects, eyewitnesses viewing a lineup may be particularly sensitive to cues from the lineup administrator and may knowingly or unknowingly incorporate them into their identification decision (Doob & Kirshenbaum, 1973). The mechanism by which eyewitnesses become increasingly sensitive to such cues is the presence of demand characteristics in lineup procedures (for a discussion of demand characteristics in psychological experiments, see Aronson, Wilson, & Brewer, 1998; Orne, 1962). Demand characteristics have been defined as "the totality of cues which convey an experimental hypothesis to the subject [and thus] become significant determinants of subjects' behavior" (Orne, 1962, p. 779). Unlike experimenter bias, which is rooted in the motives of the experimenter, demand characteristics depend on the perceptions of the participant (Orne, 1962). Note that the above definition presupposes that participants are motivated to respond in a manner that would confirm the

experimenter's hypotheses. Scholars who study demand characteristics have proposed three hypothetical motivations for experimental participants to respond in such a manner: altruism, evaluation apprehension, and obedience to authority (see Rosenthal & Rosnow, 1991, for a review).

Altruism is reflected in some participants' desire to help advance the cause of science or to promote the acquisition of new knowledge through research by being a "good subject." Orne (1962) originally described the notion of good subjects as those experimental participants who identify with both the goals of science in general as well as the success of the experiment in which they are participating. Good subjects are therefore motivated to comply precisely with all instructions and to ensure that any experiment in which they are involved is a success. A successful experiment, from the point of view of a good subject, is one in which the experimenter's hypothesis is confirmed and the cause of science is advanced.

The second motivation for an experimental participant to respond in a manner that would confirm the experimenter's hypothesis stems from the concept of evaluation apprehension, which Rosenthal and Rosnow (1991) explained is reflected in many participants' desire to win the approval of the experimenter. That is, many participants feel that the experimenter is evaluating them, and, as such, they prefer to maximize the positive aspects of their evaluation while minimizing any negative aspects.

The third motivation for participants to help confirm the hypothesis of the experimenter is known as obedience to authority. It refers to participants' desire to do what is asked of them because the experimenter is seen as an authority figure who should be obeyed (Rosenthal & Rosnow, 1991). Perhaps the best-known example of this phenomenon can be found in Milgram's (1963) study of obedience to authority in which some participants were willing to administer dangerously high levels of an electrical shock to a confederate simply because the experimenter told them to do so.

Returning to Wells and Luus's (1990) lineup-as-experiment analogy, it is apparent that all three of the above motivations thought to be present in an experiment may also be present in a lineup scenario. In other words, it is likely that an eyewitness being shown a lineup would feel a desire to help advance the cause of justice (rather than science) by being a so-called good eyewitness (altruism). In a similar manner, an eyewitness probably believes that a lineup is, in a sense, an evaluation of his or her memory of the perpetrator, and thus the eyewitness would want to maximize the positive aspects of his or her memory evaluation while minimizing the negative aspects (evaluation apprehension). Last, it is likely that an eyewitness who is shown a lineup would view the lineup administrator as an authority figure who should be obeyed (obedience to authority). This perception seems especially likely if the lineup administrator is a police officer or an employee of the police department. Such motivations then may lead an eyewitness to comply with any overt or subtle cues for expected behavior during the lineup.

Use of a double-blind lineup procedure would prevent lineup administrators from subtly communicating their hypotheses about who committed the crime under investigation to a witness, who is likely to be highly motivated to confirm that hypothesis for the reasons discussed above. Preventing such communication between lineup administrators and eyewitnesses is important because the interaction of demand characteristics and investigator bias can lead to a loss in the construct validity of the lineup test. This loss in construct validity is analogous to a similar tendency resulting from the interaction of demand characteristics and experimenter bias in an experimental testing procedure (Cook & Campbell, 1979). That is, if the lineup administrator (perhaps unintentionally) communicates his or her hypothesis to the eyewitness, the lineup may no longer be exclusively testing the witness's memory. Rather, it may be more reflective of the degree to which the lineup administrator communicated his or her hypothesis to the eyewitness.

Lineup Presentation

Previous research has shown consistently that presenting lineups sequentially instead of simultaneously reduces false identification rates in perpetrator-absent lineups without decreasing correct rejection rates (Cutler & Penrod, 1988; Lindsay, Lea, & Fulford, 1991; Lindsay, Lea, Nosworthy, et al., 1991; Lindsay & Wells, 1985). Many of these researchers have reasoned that this reduction in false identification rates occurs because eyewitnesses often engage in an absolute judgment process when lineups are presented sequentially and are likely to use a relative judgment process when lineups are presented simultaneously. These findings have led some researchers to recommend the use of sequential lineups in cases with adult eyewitnesses as a means of avoiding presentation bias (i.e., presenting lineup members simultaneously instead of sequentially; Cutler & Penrod, 1995). However, as was evident in the Howard Haupt case, a biased lineup administrator can sometimes put undue pressure on an eyewitness to use a relative judgment process. The question then becomes whether a lineup administrator's knowledge of which member of the lineup is the suspect can moderate the benefits of using sequential lineups.

Despite the strong evidence favoring the use of sequential lineups to reduce false identifications, a formal recommendation to use sequential lineups has been notably absent from published recommendations for properly conducted lineups. Most recently, Wells et al. (1998) noted that they did not make a separate recommendation to conduct lineups

sequentially because the success of this presentation style may depend on whether the lineup administrator is kept blind to the suspect's identity. Wells et al. argued that the potential biasing influence of a lineup administrator who is not blind to the suspect's identity might be greater in sequential lineups. For example, a non-blind lineup administrator could more easily discern exactly when an eyewitness is looking at the suspect's photo in a sequential lineup than in a simultaneous lineup. This knowledge could allow the experimenter to engage in intentional or unintentional biased cueing while the witness is looking at the suspect in a sequential lineup. As a result, Wells et al. suggested that lineup administrators should use sequential lineups only when they are unaware of the suspect's identity. However, they acknowledged that they knew of no published research to date that had directly tested this hypothesis.

A Lineup Observer as a Safeguard Against Investigator Bias

In addition to investigating the possible benefits associated with the use of double-blind lineup tests, it would be worthwhile to discover other safeguards against investigator bias in lineups, such as the presence of an observer during the lineup administration. One example of an observer during a real-life lineup administration is a defense attorney. Previous research has shown that defense counsel may not be particularly sensitive to some forms of lineup bias (Stinson, Devenport, Cutler, & Kravitz, 1996). However, it is possible that the mere presence of any silent observer moderates the effect of a lineup administrator's knowledge of the suspect's identity on his or her administration of the lineup. An observer whose expressed job is to oversee the fairness of the lineup procedure may cause the lineup administrator to monitor his or her own behavior to a greater extent than if the observer were not present. This observer would thereby reduce the likelihood that the administrator would knowingly or unknowingly convey biasing cues that could reveal the identity of the suspect. In this sense, the observer need not be sensitive to the various biases that can influence the suggestiveness and fairness of the lineup procedure to be beneficial.

From an applied perspective, discovery of such an observer effect would be significant because defendants and their attorneys would have control over a procedure that could improve the fairness of lineup administration. Such a finding would also be an important reason for defense attorneys to attend lineups whenever possible. At the present time, defense attorneys rarely are present when eyewitnesses are asked to make an identification, especially when photoarrays are used (Wogalter, Malpass, & Burger, 1993; Stinson et al., 1996), in part because suspects do not have the right to counsel during pre-indictment live lineups (*Kirby v. Illinois,* 1972) or photoarrays (*United States v. Ash,* 1973). Discovery of an observer effect would also provide evidence in favor of allowing or perhaps requiring defense counsel to be present during lineup administrations in order to prevent investigator bias.

Overview

The primary goal of the present study was to determine whether a lineup administrator's knowledge of the suspect's identity could produce investigator bias effects. To answer this question, in each of our experimental trials we had a participant–administrator (PA) administer two perpetrator-absent photoarrays to a participant–witness (PW). We used a double-blind testing procedure for half of the photoarrays (i.e., neither the PA nor the PW knew the identity of the suspect in the photoarrays). In the remaining photoarrays, we used a single-blind procedure in which we only informed the PA of the suspect's identity. In order to simulate the motivations that are inherent in real lineup administrations, we offered all PAs a cash incentive to obtain a positive identification of the lineup member who was the suspect.

We also manipulated the photoarray presentation style (sequential vs. simultaneous) to determine whether the predicted investigator bias effects would be more prevalent with one presentation style than with the other. Although the extant research has favored the use of sequential lineups to reduce the probability of false identifications, we believed that sequential lineup presentation would afford the PAs a greater opportunity to bias the lineups by subtly drawing more attention to the suspect's individually presented photo than to the other lineup photos.

Finally, we manipulated the presence of a silent, noninteractive observer during the photoarray administration. We believed that the presence of such an observer—whose sole purpose was to monitor the fairness of the photoarray—would motivate the PAs to consciously avoid any intentional or unintentional displays of investigator bias. We predicted that photoarray procedure would have a larger impact with sequential photoarrays than with simultaneous photoarrays, such that witnesses would make more false identifications in the single-blind condition than in the double-blind condition. We expected that this pattern of effects would be greater with the observer absent than with the observer present.

In addition to measuring the number of false identifications in each condition of our experiment, we asked all participants to rate the overall fairness of each photoarray administration. PWs also rated the degree to which they felt pressured to make an identification in each photoarray and their confidence level for each identification decision (i.e., a correct rejection, misidentification, or false identification).

We predicted that these ratings would not vary significantly from one condition to another. Participants might be unaware of any cues emitted by the PA, or, if they were aware of changes in the PA's behavior, they might be reluctant to report such changes to the experimenter.

Method

Participants

Fifty PWs viewed a live, staged crime involving a male and female perpetrator. Later, 50 PAs administered two photoarrays (one for each of two suspects) to their corresponding PW. All 100 participants were undergraduate psychology students at Florida International University (FIU) in Miami, Florida, who volunteered to be in the experiment in exchange for extra credit or credit toward a research participation requirement in their psychology classes.

Photoarrays

We constructed two perpetrator-absent photoarrays. The first photoarray consisted of mug-shot style photographs of six men, each of whom matched the general description of the male perpetrator. The second photoarray included similar photographs of six women who fit the general description of the female culprit. We selected the final 12 photos used in our photoarrays by asking 21 volunteers who did not otherwise participate in the experiment to rate 18 photos on their similarity to the perpetrators. We selected the six male and six female photos that participants rated as most similar to each respective perpetrator to be included in our photoarrays. The man and woman rated as most similar to the perpetrators were designated as the so-called suspects in our experiment. We used only perpetrator-absent photoarrays because we were interested in observing potential bias in photo lineups with an innocent suspect and five known-innocent foils.

Design

We used a 2 (photoarray procedure: single-blind vs. double-blind) × 2 (photoarray presentation: sequential vs. simultaneous) × 2 (observer presence: present vs. absent) mixed factorial design. We manipulated the photoarray procedure within participants, whereas we manipulated photoarray presentation and observer presence between participants. Each experimental unit consisted of one PW and one PA, and each experimental trial consisted of two photoarray administrations (one per perpetrator), only one of which used a double-blind procedure. Before the participants' arrival, the experimenter randomly determined which photoarray administration would be double-blind by flipping a coin. The experimenter randomly assigned participants to one level of the remaining two independent variables (photoarray presentation and observer presence) in the same manner before each trial began.

We manipulated the photoarray procedure within participants by having the experimenter reveal the identity of the suspect for only one of the two photoarrays. In the single-blind photoarray administration, the experimenter told the PA that nearly all the other witnesses had identified the suspect and that there was other physical evidence linking that particular suspect directly to the crime. In the double-blind photoarray administration, the PA learned that there was a suspect but was not informed of the suspect's identity. At no time, however, did the experimenter ever explicitly comment on the guilt or innocence of either suspect to the PA.

In a lineup conducted during an actual police investigation, the officer administering the lineup presumably knows which lineup member is the suspect, irrespective of his or her direct involvement in the case prior to the identification procedure. Moreover, the lineup administrator likely would have at least some reason to believe that the suspect committed the crime, otherwise the need for the lineup and the suspect's inclusion therein would not exist. Thus, it is reasonable to assume that the lineup administrator would be highly motivated to obtain incriminating evidence against the suspect (i.e., a positive suspect identification) to prosecute the case successfully. It follows that administrators of real-life lineups often may want the witness to identify the suspect. This situation may be especially likely to occur when the lineup administrator is the primary officer assigned to investigate the case. Thus, in order to create conditions that simulated those of actual lineup administrations, we provided PAs with an incentive to truly want the PWs to identify the suspects. The experimenter informed each PA that his or her name would be entered into a drawing for a $100 cash prize each time the corresponding PW identified one of the suspects as an actual perpetrator of the crime. In order to ensure that the PAs were equally motivated to obtain a positive identification of the suspect for both the single- and double-blind photoarray administrations, the experimenter also informed each PA that there was a suspect in the single-blind photoarray without revealing the identity of this suspect. The experimenter further informed each PA that, if the PW chose the suspect, the corresponding PA would receive a separate drawing entry for the $100 cash prize. The experimenter told all PAs that they would be disqualified from the drawing if they overtly told the eyewitness which lineup member to choose. Following each pair of photoarray administrations, the experimenter asked the PW whether the PA had revealed the suspect's identity in order to detect and disqualify any PAs who may have done so.

We manipulated photoarray presentation by instructing the PAs to administer both lineups either simultaneously or sequentially. In trials that were observer-present, the observer stood in the room during the lineup presentations. The experimenter played the role of the observer in these trials, and he informed the participants that he was present to monitor the fairness of the lineup procedure. The experimenter–observer said nothing during the lineup administrations and did not interrupt or intentionally influence the actions of the participants in any way.

Staged Crime Scenario

The staged crime took place in two large undergraduate introductory psychology courses. The crime scenario consisted of two confederates (one male and one female) interrupting the class to retrieve a television and VCR from the lecture hall. The confederates entered the room, exchanged brief remarks with the course instructor, retrieved the equipment, and then left the room within 2

min of their entry. To draw attention to the crime, each instructor acted angry that the confederates were removing the equipment during the middle of lecture and before the class watched a scheduled video. Students in both classes were completely unaware that the crimes were staged, and they were provided with full frontal, profile, and rear views of both targets.

Procedure

Participants reported to the laboratory between 3 and 15 days after the staged crimes occurred. Upon their arrival at the laboratory, the experimenter greeted the PA and PW and escorted each participant to a separate room. The experimenter informed the PA that he or she would administer a pair of police-style photoarrays to another student who had witnessed the crime simulation. He told the PA that there was one male and one female suspect and that the PA was to conduct a separate lineup for each perpetrator. The PA was further informed that the identity of only one of the two suspects would be revealed. The experimenter then instructed the PA to administer fairly each photoarray in the hope that the PW would identify the true culprits if present or to correctly reject any photoarray in which the actual perpetrator was not present.

Next, the experimenter instructed the PA on how to administer the photoarrays properly. The instructions varied according to whether the PA was to present the photoarrays sequentially or simultaneously. In the sequential presentation condition, the experimenter informed the PA that the photographs should be shown individually, that the PW should not be allowed to return to previously shown photos or to know the total number of photos to be presented, and that the lineup should end immediately on a positive identification of any lineup member. In the simultaneous presentations, the experimenter instructed the PA that all photographs should be displayed simultaneously, in full view of the PW, and for an equal amount of time before allowing the PW to identify a lineup member or to reject the lineup.

The experimenter permitted PAs in each trial to display the photos in any order or pattern they chose, requiring only that the PA be as fair as possible and that she or he never directly tell the PW which photoarray member to identify (recall that all PAs were warned that doing so would disqualify them from the drawing for the cash prize). The experimenter told the PA that his or her corresponding PW would know the basic purpose of his or her visit to the laboratory. However, to ensure that the PW fully understood the identification task, the experimenter told the PA to inform the PW that (a) the actual criminal may or may not be present in the lineup, and that the lineup should be rejected if it did not contain the criminal; (b) lineup members may or may not have altered their physical appearance (e.g., hairstyle or clothing) after the crime; and (c) each photograph should be examined carefully while recalling the faces of the two people who removed the video equipment from the classroom. We based these instructions on a standard instruction used by the Los Angeles Police Department during actual photoarray administrations.

After verifying that the PW was present in class on the day of the staged crime, the experimenter informed the PW that he or she would be asked to identify the two perpetrators responsible for removing the video equipment from the lecture hall. The experimenter explained that the identification procedure would consist of viewing two police-style photo lineups. He next informed the PW that another person (the PA) would administer the two photoarrays. The experimenter then accompanied the PW to the room in which the PA was waiting and introduced the two participants; then the identification procedure began.

After the administration of both photoarrays, the PA and PW provided ratings of the photoarray procedure's fairness. These ratings, along with self-report ratings of the degree to which the PW felt pressure to identify a photoarray member, were all made on 9-point, Likert-type scales. The PW also rated his or her confidence in each identification on a scale ranging from 1 (*not at all confident*) to 9 (*completely confident*). Once the PA and PW completed their scales, the experimenter debriefed both participants and dismissed them from the experiment.

Results

We conducted a 2 (photoarray procedure) × 2 (photoarray presentation) × 2 (observer presence) repeated measures analysis of variance (ANOVA) to determine whether any of our experimental manipulations affected the proportion of PWs who chose any member of our perpetrator-absent photoarrays as the perpetrator of our simulated crime. Although ANOVAs generally are not conducted on dichotomous variables, ANOVA was the only method of analyzing this data because of the within-subject manipulation (i.e., logistic regression models cannot include repeated measures). Moreover, ANOVA is robust to violations of the normality assumption. This analysis revealed no significant differences between the proportion of PWs making an identification (i.e., failing to correctly reject the perpetrator-absent lineups) across all conditions. For both the single- and double-blind photoarrays, 82% of the PWs positively identified one of the photoarray members as being the guilty culprit.

Next, we conducted a similar 2 (photoarray procedure) × 2 (photoarray presentation) × 2 (observer presence) repeated measures ANOVA to examine the proportion of PWs who falsely identified the suspect as the criminal in the various experimental conditions. This analysis revealed a statistically significant main effect of photoarray presentation on the proportion of PWs who falsely identified the suspect, $F(1, 46) = 5.47$, $p < .05$, $d = .47$, $\eta^2 = .11$. False suspect identifications occurred significantly more often in sequential lineups than in simultaneous lineups (the proportions were .30 and .10, respectively). However, this main effect for photoarray presentation was qualified by a statistically significant three-way interaction between photoarray procedure, photoarray presentation, and observer presence, $F(1, 46) = 4.55$, $p < .05$, $\eta^2 = .09$.

We conducted a simple effects test to follow up the significant Photoarray Procedure × Photoarray Presentation × Observer Presence higher-order interaction. This test demonstrated that when the observer was present and photoarrays were presented simultaneously, the proportion of

PWs falsely identifying the innocent suspect did not differ for the single- versus double-blind photoarray procedures (see Figure 1 for proportions). However, when the observer was present and photoarrays were presented sequentially, suspect misidentifications occurred significantly more often with the single-blind photoarray procedure than with the double-blind photoarray procedure (see Figure 1 for proportions). For observer-absent photoarrays, there were no differences in false identification rates for the single- versus double-blind procedures, irrespective of whether they were presented sequentially or simultaneously.

Two separate 2 (photoarray procedure) × 2 (photoarray presentation) × 2 (observer presence) repeated measures ANOVAs using PA and PW ratings of photoarray fairness as the dependent measures showed that participants' ratings of photoarray fairness did not differ as a function of any of the manipulated variables. In general, both PAs and PWs considered the photoarray procedures to be fair and unbiased whether these procedures were single- or double-blind (all Ms > 7.6 on 9-point scales). Moreover, a 2 (photoarray procedure) × 2 (photoarray presentation) × 2 (observer presence) repeated measures ANOVA with PWs' ratings of pressure to make an identification as the dependent variable showed that this measure also was unaffected by any of the manipulations (all Ms < 4.9 on a 9-point scale). Thus, across all conditions, PWs did not report that they felt pressured to make an identification by the PAs.

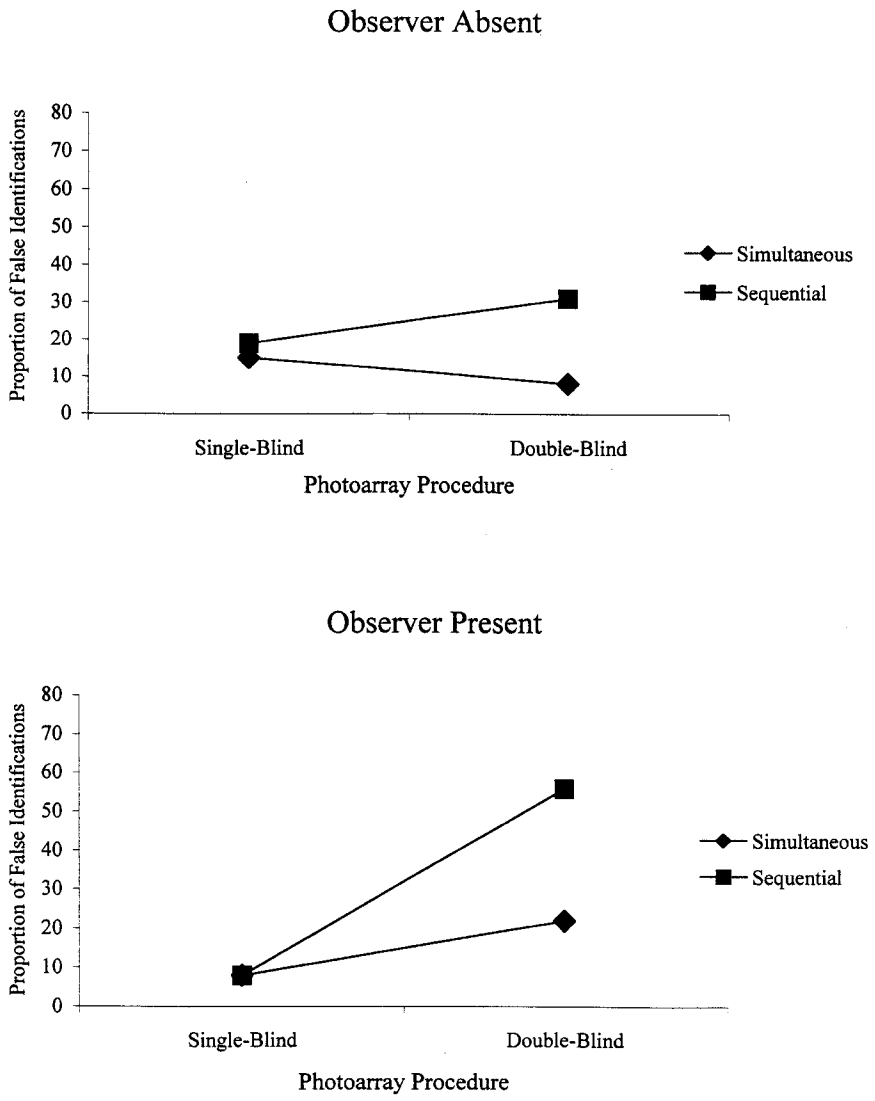

Figure 1. Proportion of false identifications as a function of photoarray procedure, photoarray presentation, and observer presence.

Finally, we subjected PWs' confidence ratings to a 2 (photoarray procedure) × 2 (photoarray presentation) × 2 (observer presence) repeated measures ANOVA to determine if differences in PWs' confidence ratings arose because of our experimental manipulations. Results revealed a marginally significant difference in the PWs' confidence ratings for the single- versus double-blind photoarray procedures, $F(1, 46) = 3.15$, $p < .10$, $\eta^2 = .11$, such that PWs were slightly less confident when exposed to the single-blind photoarray procedure ($M = 4.54$) compared with the double-blind photoarray procedure ($M = 4.98$). Correlational analyses indicated that confidence was unrelated to accuracy for both the single- and double-blind photoarray procedures ($rs = .10$ and $.09$, *ns*, respectively).

Discussion

Evidence for Investigator Bias

Our results support the hypothesis that in certain circumstances a photoarray administrator's knowledge of which lineup member is the suspect can increase the likelihood that a witness will identify the suspect. Investigator bias was present when PAs used a single-blind, sequential photoarray procedure in the presence of an observer. That is, witnesses who viewed sequential photoarrays that were presented by PAs who knew the suspect's identity were more likely to falsely identify the suspect as the criminal when an observer was present. Note that this effect was present despite the fact that the experimenter instructed PAs to administer the photoarrays fairly. For example, recall that PAs were explicitly told to warn the PWs that the true culprits may not be present in the photoarrays. On the basis of these data, we recommend that law enforcement agencies keep photoarray administrators blind to the identity of the suspect when photoarrays are used during criminal investigations. Moreover, minimizing an administrator's knowledge of the background information pertaining to the case (e.g., incriminating evidence against a particular lineup member, eyewitness descriptions of the perpetrator) also may decrease the potential for investigator bias.

Thus, sequential photoarray presentation may increase the likelihood that investigator bias will occur under certain circumstances. Our results validate concerns previously expressed by psycholegal researchers (e.g., Wells et al., 1998) regarding sequential lineups. Because it may be easier to bias the presentation of a single photo than the presentation of several at the same time, sequential lineups may be more susceptible to potential bias from an administrator who knows the suspect's identity. One could infer, on the basis of our data, that simultaneous lineup presentation is preferable when an investigator knows the suspect's identity. We argue against this conclusion because of the well-documented ability of sequential lineups to reduce the occurrence of other lineup biases, such as foil bias, instruction bias, and clothing bias (e.g., see Cutler & Penrod, 1995; Lindsay, Lea, Nosworthy, et al., 1991). Rather, we do recommend the use of sequential lineups but only by a lineup administrator who has no knowledge of the suspect's identity.

Contrary to our predictions, the presence of an observer during the administration of photoarrays failed to reduce (and exacerbated in some instances) the presence of investigator bias. One potential explanation for this unexpected finding involves the dual role of the experimenter in our study (recall that the experimenter was the observer in the observer-present photoarray trials). Because it was the experimenter who initially biased some of the photoarrays by revealing the suspect's identity to the PAs and by providing incriminating evidence against the suspect, the PAs may have felt an increased motivation to provide biased cues to the PWs in the observer-present photoarrays. In essence, PAs may have believed that the experimenter–observer wanted them to bias the lineup, despite his instructions to the contrary. These potential unanticipated effects resulting from the experimenter's dual role in our study may be minimized or eliminated in future studies by having a third hypothesis-blind confederate assume the observer role in observer-present photoarrays. We suspect that introducing a blind confederate to observe the photoarray administrations would be more likely to decrease investigator bias than was the observer-present manipulation used in our study.

Nonetheless, our finding that the presence of an observer at a single-blind, sequential photoarray can increase false identifications has implications for the administration of actual photoarrays. In real-life eyewitness identifications, there are a variety of observers whose presence may have an effect similar to that of the experimenter–observer in our study. Fellow police officers, supervisors, prosecutors, victims, or cowitnesses who are present during a lineup administration may inadvertently increase the pressure felt by an administrator to obtain a positive suspect identification. At the same time, the presence of such individuals may also increase the pressure felt by an eyewitness to provide a positive identification. As in our experiment, observers may have such negative effects even when the expressed purpose of their presence is to monitor the fairness of the lineup procedure. We recommend, therefore, that any observer who is present during the lineup administration should be blind to the identity of the suspect and should know very little background information about the case. Keeping to a minimum the number of observers present during a lineup administration may also serve to reduce the pressure an administrator and witness feel to gain a suspect identification, although our data do not speak directly to this issue.

It is interesting to compare our results with those of earlier studies examining false identification rates in sequential and simultaneous lineups (e.g., Cutler & Penrod, 1988; Lindsay, Lea, & Fulford, 1991; Lindsay, Lea, Nosworthy, et al., 1991; Lindsay & Wells, 1985). Experimenters who knew the suspect's identity administered the lineups in previous research; thus, these studies used a single-blind lineup procedure. These studies, at least as indicated by their described methods, did not have observers present during the lineup administrations. Overall, this research demonstrates that sequential lineups produce fewer false identifications than do simultaneous lineups. We obtained different results in our study. When our PAs administered single-blind lineups without an observer present, lineup presentation style did not influence the false identification rate.

Why did we obtain different results? One reason could be that the administrators in our study had a different motivation than did the researchers who administered the lineups in previous studies. In our study, PAs were offered a monetary incentive for obtaining a suspect identification and tried to obtain one whether they administered a sequential or a simultaneous photoarray. In previous research on lineup presentation researchers had a hypothesis that sequential lineups produced fewer false identifications than simultaneous lineups. Because researchers knew the identity of the suspect, they may have helped obtain these hypothesized effects if they unwittingly communicated this information to the witness more often in the simultaneous condition (i.e., the condition in which they were motivated to obtain more false identifications) than in the sequential condition.

Ratings of Fairness and Pressure to Choose

Our finding that the PWs' and PAs' ratings of lineup fairness were not related to any of the manipulated variables in our study confirmed our a priori predictions. One relatively straightforward interpretation of this finding is that participants were simply unaware of any changes in the PAs' verbal or nonverbal behavior that may have resulted from the interaction of our independent variables. That is, although the PAs appeared to have somehow behaved differently in the single-blind, sequentially presented, observer-present photoarray condition, this altered behavior simply may have gone undetected by the PWs and the PAs. A second possible explanation is that the participants in fact detected the PAs' altered behavior but did not perceive this change in behavior to be unfair or biased. A third explanation suggests that participants may have been consciously aware of the altered behavior, did in fact label it as unfair, but in the end were reluctant to report it to the experimenter. Perhaps, as may be the case with a lineup administrator and witness in an actual case, PWs identified with their respective PAs because they perceived them as partners who shared the common goal of correctly identifying the criminal. If this were indeed the case, notifying the experimenter of any perceived bias on the part of the PA may have seemed to constitute betraying that person. Thus, even if the PWs were sensitive to certain cues emitted by the administrators, they may have been reluctant to report such behavior to the experimenter.

The fact that the PWs' and PAs' ratings of lineup fairness did not relate to any of the manipulated variables in our study has implications for the way in which real-life eyewitness identifications should be treated. First, it suggests that asking an eyewitness or a lineup administrator whether a lineup was biased may not be particularly useful because they lack the ability (or willingness) to report the bias. Note that this may also apply to asking such questions of an eyewitness during cross-examination in a trial or deposition, which may in turn suggest that cross-examination of eyewitnesses is not an adequate safeguard against investigator bias. Second, it suggests that investigator bias may indeed be at least partly unintentional because PAs tended to rate all photoarray administrations, regardless of condition, as being fair and unbiased.

Another indicator of the PWs' awareness (or lack thereof) of investigator bias was their ratings of the degree to which they felt pressured to make an identification. These ratings were also unrelated to any of the manipulated variables, thereby suggesting that PWs in the biased photoarray administrations did not feel any more pressure to make an identification than did those in the unbiased administrations. Nonetheless, the fact that the innocent suspects were misidentified more often in the single-blind sequential lineups with the observer present reflects at least some increased pressure to identify the innocent suspect under those conditions. Perhaps the PWs who were given biased photoarrays did not report any extra pressure to make an identification for reasons similar to those described above in reference to the fairness ratings.

The data on the PW and PA ratings of lineup fairness and the PWs' ratings of pressure to make an identification imply that witnesses and lineup administrators are at least somewhat unaware of how and when investigator bias is present. Defense attorneys, however, have been shown to be very skeptical of sequentially presented photoarrays (Stinson et al., 1996). Until now, it seemed as though this finding meant that attorneys are unable to see that sequential lineups are superior to simultaneous lineups. Given our results, attorneys may be justified in their suspicion of sequential lineups.

Witness Confidence

The PWs in the single-blind photoarray conditions felt somewhat less confident in their identification decisions

than did those in the double-blind conditions. This finding possibly reflects increased pressure from the PAs in the single-blind photoarrays to make identifications even when the PWs were not confident in their accuracy. One potential explanation for this marginally significant main effect is that PAs in all single-blind conditions gave at least some cues to the PWs regarding the suspect's identity, and that these cues often were very subtle and difficult to interpret. As a consequence, the PWs in all single-blind conditions may have been confused enough by the vague messages sent by the PAs to lower their confidence in whatever final decision they made. We further believe that it was only in the single-blind, sequentially presented, observer-present photoarrays that the PAs were motivated and able enough to send cues that specifically singled out the suspect.

Caveats

Despite our demonstration of a previously hypothesized threat to lineup fairness (e.g., Wells et al., 1998), we have several caveats to address with regard to the current study. First, the fact that we used only perpetrator-absent photoarrays and weak memory traces has left us somewhat ignorant of the malleability of judgments of eyewitnesses who are shown perpetrator-present lineups or eyewitnesses who have strong memory traces of a criminal's face.

A second caveat of the present study is that we have no way of taking into account the differences between consequences of real-life crimes and eyewitness identifications as compared with those contained in our laboratory simulation. For example, although the staged crime event in our study may have been somewhat salient, it is doubtful that the eyewitnesses found it stressful or traumatic. The results of our study are likely to generalize to real-life situations in which eyewitnesses see a crime occur but do not realize until later that what they saw was a criminal act. However, it is possible that our data will not apply to cases in which eyewitnesses view a violent or otherwise traumatic event. In a similar manner, when participants reported to our experiment, they might have realized that the crime event they witnessed was only a simulation and therefore could not result in any real harm or injustice. As a result, they may have been less motivated to perform to the best of their ability when completing (or administering) the identification task, or they may have taken the task less seriously. Thus, it is possible that PWs in our study had a more lax criterion for identifying a photoarray member because they were aware that their identifications were part of an experiment. Eyewitnesses to actual crimes (especially victims) may be more motivated to perform well and may take the identification task more seriously simply because they know the crime was real and want it resolved by bringing the guilty party to justice. These variables could lead actual eyewitnesses to use a more stringent criterion for making a positive identification—one that may be more (or less) resistant to investigator-biased cues.

Finally, the student PAs in our study also did not have extensive training or experience administering photoarrays. It is reasonable to ask whether experienced police professionals who know the suspect's identity would be more or less susceptible to investigator bias than were the PAs in our study. Nevertheless, we believe that actual police investigators would be no more likely to monitor their behavior to avoid sending biased cues to an eyewitness than were the PAs in our study. Note that this belief is consistent with our finding that investigator bias is likely to occur outside the awareness of the administrator.

Directions for Future Investigator Bias Research

In developing a framework to better understand investigator bias, we believe that four essential research questions should be examined. First, does a lineup administrator's knowledge of the suspect's identity in a particular lineup result in investigator bias as reflected by an increase in the probability that the witness will identify the suspect? The present study has provided some evidence that, under certain conditions, the answer to this first question is yes. Second, how does the lineup administrator communicate this knowledge to the eyewitness? Third, are witnesses, attorneys, and other members of the legal system able to identify investigator bias when it is present? Finally, does investigator bias influence identification decisions at a conscious or preconscious level of awareness? Our data have provided some evidence suggesting that lineup administrators and eyewitnesses are both relatively unaware of investigator bias if and when it occurs. Nevertheless, more research focusing on the perceptions and specific behaviors of those involved in identification decisions is clearly needed to gain a more complete understanding of this complex but important area of study.

References

Aronson, E., Wilson, T. D., & Brewer, M. B. (1998). Experimentation in social psychology. In D. T. Gilbert, S. T. Fiske, & G. Lindzey (Eds.), *Handbook of social psychology: Vol. 1* (4th ed., pp. 99–142). New York: McGraw-Hill.

Buckhout, R. F. (1974). Eyewitness identification. *Scientific American, 231,* 21–31.

Buckhout, R. F., Figueroa, D., & Hoff, E. (1975). Eyewitness identification: Effects of suggestion and bias in identification from photographs. *Bulletin of the Psychonomic Society, 6,* 71–74.

Cook, T. D., & Campbell, D. T. (1979). *Quasi-experimentation: Design and analysis issues for field settings.* Boston: Houghton Mifflin.

Cutler, B. L., & Penrod, S. D. (1988). Improving the reliability of

eyewitness identification: Lineup construction and presentation. *Journal of Applied Psychology, 73,* 281–290.

Cutler, B. L., & Penrod, S. D. (1995). *Mistaken identification: The eyewitness, psychology, and law.* New York: Cambridge University Press.

Doob, A. N., & Kirshenbaum, H. M. (1973). Bias in police lineups: Partial remembering. *Journal of Police Science and Administration, 1,* 287–293.

Fanselow, M. S. (1975). How to bias a witness continued: Experimental evidence for the non-verbal bias factor in eyewitness identification testing. *Social Action and the Law, 2,* 3–4.

Fanselow, M. S., & Buckhout, R. F. (1976). *Nonverbal cueing as a source of biasing information in eyewitness identification testing* (Center for Responsive Psychology Monograph No. CR-26). New York: Brooklyn College, City University of New York.

Kirby v. Illinois, 406 U.S. 682 (1972).

Lindsay, R. C. L., Lea, J. A., & Fulford, J. A. (1991). Sequential lineup presentation: Technique matters. *Journal of Applied Psychology, 76,* 741–745.

Lindsay, R. C. L., Lea, J. A., Nosworthy, G. J., Fulford, J. A., Hector, J., LeVan, V., & Seabrook, C. (1991). Biased lineups: Sequential presentation reduces the problem. *Journal of Applied Psychology, 76,* 796–802.

Lindsay, R. C. L., & Wells, G. L. (1985). Improving eyewitness identifications from lineups: Simultaneous versus sequential lineup presentation. *Journal of Applied Psychology, 70,* 556–564.

Loftus, E. F., & Ketcham, K. (1991). *Witness for the defense: The accused, the eyewitness, and the expert who puts memory on trial.* New York: St. Martin's Press.

Milgram, S. (1963). Behavioral study of obedience. *Journal of Abnormal and Social Psychology, 67,* 371–378.

Orne, M. T. (1962). On the social psychology of the psychological experiment: With particular reference to demand characteristics and their implications. *American Psychologist, 17,* 776–783.

Rosenberg, M. J. (1969). The conditions and consequences of evaluation apprehension. In R. Rosenthal & R. L. Rosnow (Eds.), *Artifact in behavioral research* (pp. 279–349). New York: Academic Press.

Rosenthal, R. (1976). *Experimenter effects in behavioral research* (enlarged ed.). New York: Irvington.

Rosenthal, R., & Rosnow, R. L. (1991). *Essentials of behavioral research: Methods and data analysis.* New York: McGraw-Hill.

Stinson, V., Devenport, J. L., Cutler, B. L., & Kravitz, D. A. (1996). How effective is the presence of counsel safeguard? Attorney perceptions of suggestiveness, fairness, and correctability of biased lineup procedures. *Journal of Applied Psychology, 81,* 64–75.

United States v. Ash, 413 U.S. 300 (1973).

Wells, G. L. (1984). The psychology of lineup identifications. *Journal of Applied Social Psychology, 14,* 89–103.

Wells, G. L. (1993). What do we know about eyewitness identification? *American Psychologist, 48,* 553–571.

Wells, G. L., & Luus, C. A. E. (1990). Police lineups as experiments: Social methodology as a framework for properly conducted lineups. *Personality and Social Psychology Bulletin, 16,* 106–117.

Wells, G. L., & Seelau, E. P. (1995). Eyewitness identification: Psychological research and legal policy on lineups. *Psychology, Public Policy, and Law, 1,* 765–791.

Wells, G. L., Seelau, E. P., Rydell, S. M., & Luus, C. A. E. (1994). Recommendations for conducting lineups. In D. F. Ross, J. D. Read, & M. P. Toglia (Eds.), *Adult eyewitness testimony: Current trends and developments* (pp. 223–244). New York: Cambridge University Press.

Wells, G. L., Small, M. A., Penrod, S. D., Malpass, R. S., Fulero, S. M., & Brimacombe, C. A. E. (1998). Eyewitness identification procedures: Recommendations for lineups and photospreads. *Law and Human Behavior, 6,* 603–647.

Wolgalter, M. S., Malpass, R. S., & Burger, M. A. (1993). How police officers conduct lineups: A national survey. *Proceedings of the Human Factors and Ergonomics Society, 37,* 640–644.

Received October 26, 1998
Revision received February 9, 1999
Accepted February 10, 1999 ■