

SHORT NOTES

Sequential Lineup Presentation: Technique Matters

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Lindsay and Wells (1985) demonstrated that sequential lineup presentation was superior to simultaneous presentation. However, these benefits may have been dependent on specifics of the procedure used. Three experiments were conducted to test the influence on eyewitness accuracy of (a) a "second chance" after viewing a sequential lineup ($N_s = 180$ and 32) and (b) prior knowledge of lineup size ($N = 254$). When photos were presented simultaneously, a second opportunity to choose decreased correct rejection decisions and increased false identifications without increasing the correct identification rate. However, a second sequential presentation did not lead to significant changes in identification decisions. Knowledge of the number of lineup members in a sequential lineup increased selections of an innocent suspect. Witnesses viewing sequential lineups should not be aware of the number of faces to be presented and should not be allowed to view the lineup more than once.

Real-world lineups are composed of suspects (guilty or innocent) and foils (distractors who are known to be innocent). Identifications of foils are known errors and discredit the eyewitness rather than the person identified. Identifications of suspects are treated as evidence of guilt. However, suspects are not always guilty, and false identification of innocent suspects from lineups is acknowledged as a serious problem resulting in wrongful conviction (e.g., Loftus, 1979; Woocher, 1977).

Wells (1984) argued that false identifications by eyewitnesses may result from the use of a relative judgment process (selecting the person in the lineup who looks most like the criminal) rather than an absolute judgment process (deciding if each face was or was not the person previously seen). Witnesses to a staged crime who made no identification when presented with a blank lineup (a lineup composed entirely of foils) subsequently made more correct and fewer false identifications than either witnesses who chose someone from the blank lineup or witnesses not exposed to the blank lineup. Wells concluded that the blank lineup "screened out" witnesses prone to making relative judgments.

Lindsay and Wells (1985) extended this logic by using a sequential lineup, a procedure in which each lineup member is presented individually, in sequence. Each time a lineup member is presented, the witness must decide whether or not the lineup member is the perpetrator. Lindsay and Wells reasoned that witnesses who viewed a lineup sequentially, without knowledge of the number of faces to be presented, would have more difficulty using a relative judgment process than wit-

nesses presented with the same lineup in the customary simultaneous manner. Consistent with this reasoning, witnesses in the sequential lineup condition made significantly fewer false identifications of the innocent suspect and significantly more correct rejections of the criminal-absent lineup than did witnesses in the comparable simultaneous presentation conditions. The rate of correct identification was not significantly affected.

However, Wells (1988), in his handbook for legal practitioners, did *not* unequivocally recommend the use of sequential lineup techniques. He correctly pointed out that a single experiment should not be the basis for a change in policy. He also argued (again correctly) that the technique used by Lindsay and Wells (1985) could be varied in many ways and with unknown effects on identification accuracy. Two possible variations would be to inform the witness of the number of faces to be seen (e.g., "We're going to show you eight pictures of possible suspects. . .") or to allow the witness a second opportunity to view the lineup if he or she failed to identify someone from the sequential presentation (e.g., "Well, just take another look to be sure you haven't missed him"). If sequential lineup presentation reduces false identification by reducing witnesses' reliance on relative judgments, a second opportunity to view the lineup may result in a return to higher rates of false identification, particularly if the second opportunity is presented simultaneously. Similarly, knowledge of the number of lineup members may increase pressure on the witness to choose as the sequentially presented lineup comes to an end. Certainly police might tell witnesses (intentionally or inadvertently) of the number of lineup members or show them the lineup again if they fail to identify the suspect. Indeed, the Law Reform Commission of Canada states in its recommended procedures that police may show the lineup to witnesses again if they fail to choose anyone from a sequential procedure (Brooks, 1983).

Replications of the superiority of sequential presentation as a

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means of reducing false identifications have been reported (Cutler & Penrod, 1988; Lindsay, 1990; Parker & Ryan, 1990; Sporer, 1990). The experiments reported here address the effects on identification accuracy of revealing the number of lineup members and of allowing witnesses a second opportunity to identify someone after seeing a sequentially presented lineup.

Experiment 1

To test the impact of giving witnesses a second opportunity to identify someone after seeing a sequentially presented lineup, we presented a staged crime to unsuspecting undergraduates, who subsequently attempted identifications from criminal-present or criminal-absent lineups presented sequentially or simultaneously. Witnesses who first viewed the lineup sequentially were given an unexpected opportunity to examine the same lineup again in a simultaneous presentation. The decision to present the lineup simultaneously for the second presentation was based on the belief that police asking a witness to reconsider his or her decision might simply spread the photographs out in front of the witness.

Method

Undergraduate students from Queen's University ($N = 180$; 67% women; mean and median age = 19) volunteered to participate in an experiment on "complex information processing." One or two participants were met by the experimenter, led into the laboratory, seated on a couch, and told that the experimenter had a few last-minute preparations to make. The experimenter left her purse and some papers in view on a table and left, commenting that one more subject was still expected. After a delay of approximately 1 min, a 27-year-old male confederate entered the room, sat down approximately 2 m from the subjects, and conversed with them. After clearly establishing eye contact with each subject, the confederate looked about, examined the papers on the table, then grabbed the experimenter's purse and ran out of the room.

The experimenter returned, informed the subjects (now witnesses) of the true purpose of the experiment, and obtained their signed consent to continue as participants. In sessions involving more than one witness, each witness completed the remainder of the procedure in separate rooms. The witnesses completed open-ended descriptions of the criminal and then responded to detailed questions about his appearance. Next the witnesses were asked to attempt to identify the criminal from 8-person photographic lineups. The instructions clearly indicated that the guilty party might or might not be in the lineup. The lineup foils were selected to be similar to the suspects in general physical and facial appearance. Functional sizes (Wells, Leippe, & Ostrom, 1979) were 3.60 and 4.58 for the criminal-present and criminal-absent lineups, respectively.

Equal numbers of witnesses attempted to identify the culprit from lineups presented sequentially versus simultaneously. For some witnesses ($n = 60$) the "criminal" was present in the lineup, whereas for others ($n = 120$) his photo was replaced with that of a similar looking person, representing an innocent suspect arrested because he fit the description of the culprit.

Witnesses in the sequential lineup conditions were not informed of the number of photos to be seen, but the identification form had places to respond to 12 photos. Each line of the response form asked "Is number _____ the person you saw?" followed by the words *yes* and *no* and a confidence scale ranging from 1 (*not at all certain*) to 7 (*absolutely*

certain). Witnesses were instructed to look at each face as long as they wished and, when they had decided, to circle the appropriate word and number. The next picture would then be shown. These witnesses were also told they would only see each picture once and that they could not go back to alter previous decisions once they had gone on to another photo. The suspects were the last (eighth) photos presented. Each witness responded to every face. Thus, even if the witness selected someone, any remaining photographs were presented. (These are the same procedures used by Lindsay and Wells, 1985.) After the eighth photo was presented, witnesses were informed that there were no further photos but were subsequently shown the same eight faces simultaneously and given an opportunity to change their decision if they wished.

Witnesses in the simultaneous lineup conditions saw eight photographs mounted on a single page numbered 1 through 4 across the top and 5 through 8 across the bottom. The identification form had nine boxes. Two rows of four boxes with the numbers 1–8 in each corresponded to the position of the pictures. The remaining box was below the other eight boxes and contained the words "none of them." Witnesses were instructed to place an X through the appropriate box and to rate their confidence that the decision was correct by circling a number ranging from 1 (*not at all certain*) to 7 (*absolutely certain*).

We analyzed the three possible decisions that each witness could make: identification of a suspect (innocent or guilty), identification of a foil (anyone other than a suspect), or rejection of the lineup (identifying no one). An innocent suspect was designated to simulate a single-suspect lineup. Single-suspect lineups are recommended by legal experts (e.g., Brooks, 1983; Sobel, 1972) and psychologists (e.g., Wells & Turtle, 1986). Considering any choice from a criminal-absent lineup to be a false identification overestimates the rate of false identifications in real-world lineups. Through pilot testing, we selected the face most similar to the confederate as the innocent suspect, so false identification rates should be somewhat inflated compared with the real world (because real innocent suspects may not resemble the perpetrator as closely). However, this inflation is beneficial in this research. If a lineup procedure can protect a very similar looking but innocent suspect, a dissimilar innocent suspect should be safe as well. In all of the studies reported, the innocent suspects were identified more frequently than any of the foils (as would be expected since the innocent suspects were most similar to the confederates).

Results and Discussion

As Lindsay and Wells (1985) found, the rate of accurate identification of the criminal was not significantly different in the simultaneous (56.7%) and sequential (46.7%) conditions, $Z = 0.78$. However, correct rejections were significantly more common in sequential lineups (76.7%) than in simultaneous lineups (43.3%), $Z = 3.67$, $p < .01$. False identifications (of the innocent suspect) were lower in sequential (5.4%) than in simultaneous lineups (20.0%), $Z = 2.35$, $p < .01$. Thus, the sequential lineup presentation effects reported by Lindsay and Wells were replicated.

More germane to current concerns are the decisions of witnesses who saw the sequential lineup and the subsequent simultaneous lineup (see Table 1). Allowing the witnesses to examine the lineup again produced a small increase in the rate of accurate identification (from 46.7% to 53.3%), $Z = 0.00$, *ns*. Z values for correlated proportions were calculated as recommended by Ferguson (1981). Apparently, the police will not obtain substantially more correct identifications by permitting witnesses who have viewed a sequential lineup to attempt the identification

again from a simultaneous presentation. Of course, police probably wouldn't ask a witness who had already identified the suspect to attempt a second identification. If only those who had not selected the suspect had made a second choice, the final percentage of correct identifications would have been 60.0% (compared with 46.7% for first choices), $Z = 1.50$, *ns*.

Witnesses in the criminal-absent, sequential lineup conditions ($N = 60$) identified the innocent suspect 5.0%, foils 11.7%, and no one 76.7% of the time. Some witnesses (6.7%) identified more than one person from the lineup. Given a second chance, 36.7% of witnesses in the innocent-suspect conditions changed their identification decisions. The rate of correct rejections declined from 77% to 55%, $Z = 5.17$, $p < .01$. Perhaps witnesses who have identified no one and then are given a second chance feel that the experimenter is implying that their first decision was incorrect. Such demand characteristics might also apply if a police officer were to follow the same procedure. The rate of false identifications increased significantly (from 5.0% to 26.7%), $Z = 3.39$, $p < .01$. Of those subjects in the criminal-absent condition whose first and second identifications differed, 4 changed from an incorrect to a correct identification, whereas 18 changed from a correct to an incorrect decision, $\chi^2(1, N = 22) = 6.96$, $p < .01$. Two other witnesses changed from one incorrect decision to another incorrect decision.

Wells and Lindsay (1980, 1985) argued that the diagnosticity ratio may be the best indication of the potential value of a lineup technique as a source of evidence. The diagnosticity ratio is calculated as the ratio of the proportions of correct and false decisions but is calculated separately for suspect identifications and lineup rejections. The higher the diagnosticity ra-

tio, the greater the probative value of identification decisions from such lineups should be. The diagnosticity ratios were 2.84, 9.34, and 2.58 for identifications of suspects from the simultaneous, sequential, and sequential followed by simultaneous (second choice) identification procedures, respectively. A second chance to make an identification completely eliminated the probative superiority of sequential lineups (see Table 1).

Overall, eyewitness identification accuracy on second decisions (54.4%) was lower than that for first decisions (66.7%), $Z = 1.73$, $p < .05$, and not significantly different from identification accuracy in simultaneous lineups (47.7%), $Z = 0.90$. A second opportunity to choose lowered the accuracy rate by decreasing correct rejections of criminal-absent lineups and by increasing false identifications.

Sequential lineup procedures (properly conducted) result in so few false identifications (3 in this case) that insufficient data exist to meaningfully calculate confidence-accuracy correlations (Lindsay, 1986; Wells & Lindsay, 1985). The correlation from the simultaneous lineups was .19, *ns*. Because Experiments 2 and 3 do not include both criminal-present and criminal-absent lineups, confidence-accuracy correlations could not be computed for those studies, and subjects' confidence in their decisions is not discussed further in this article.

Experiment 2

Experiment 2 also was conducted to test the effect of a second opportunity to identify someone after a sequential lineup. In this case, the second lineup was presented either simultaneously or sequentially.¹

Method

Introductory psychology students ($N = 32$, 17 women) participated in exchange for extra course credit. The staged crime was similar to the one used in Experiment 1, but a different confederate and experimenter were used. All of the witnesses viewed a criminal-absent lineup presented sequentially. The lineup was extremely biased (for a study reported elsewhere; Lindsay et al., in press). Only the innocent suspect wore the same shirt worn by the confederate during the crime, none of the foils resembled the suspect who did resemble the confederate, and the instructions clearly stated that the guilty person was in the lineup. The instructions with regard to sequential presentation were identical to those used in Experiment 1, except that the response form had 15 lines on it. Once again, an eight-person lineup was used. The second opportunity to identify someone was presented simultaneously to half of the witnesses and sequentially to the remaining half of the witnesses.

Results and Discussion

Because of the biased lineup procedure, we expected and found a somewhat higher rate of false identification than usual (25%). However, of greater concern in this study was the frequency of false identifications on the second presentation of the lineup. Of the witnesses who saw the lineup presented sequentially both times, 25% made false identifications the first time and 28% made false identifications the second time; that is, only 1 witness out of 16 changed decisions from a rejection of

Table 1
Identification Decisions (%) and Diagnosticity Ratios Resulting from Simultaneous, Sequential, and Sequential Followed by Simultaneous Lineup Procedures (Study 1)

Lineup method	Identification		
	Suspects	Foils	No one
Simultaneous			
Criminal present	56.7	20.0	23.3
Criminal absent	20.0	36.7	43.3
Diagnosticity ratio	2.84 ^a	—	1.86 ^b
Sequential ^c			
Criminal present	46.7	6.7	40.0
Criminal absent	5.0	11.7	76.7
Diagnosticity ratio	9.34 ^a	—	1.92 ^b
Sequential and simultaneous			
Criminal present	60.0 ^d	13.3	33.3
Criminal absent	26.7	18.35	55.0
Diagnosticity ratio	2.58 ^a	—	1.65 ^b

^a Proportion of correct identifications: proportion of false identifications.

^b Proportion of correct rejections: mistaken rejections of the lineup.

^c Values for the sequential lineup conditions do not add up to 100% because 6.7% of the subjects in each of the criminal-present and criminal-absent lineup conditions selected more than one person from the lineup.

^d This is the most liberal (positive) estimate of the correct identification rate. The diagnosticity ratio based on the low estimate would be 2.00.

¹ We are indebted to Brian Cutler for suggesting this study.

the lineup to an identification of the innocent suspect. The remaining 15 witnesses in this condition reiterated their original decisions. When the second exposure to the lineup was simultaneous, 69% of the witnesses made a false identification, with 5 of 16 witnesses (31%) changing from correctly rejecting the lineup to falsely identifying the innocent suspect. Two others changed from correct rejections to foil identifications. Overall, correct choices were made on the second lineup presentation by 72% of the witnesses in the sequential condition but by only 12% of the witnesses in the simultaneous condition, $Z = 3.57$, $p < .01$.

Once again, it seems that giving witnesses a second chance to observe the lineup may be quite dangerous, particularly if the second lineup is presented simultaneously.

Experiment 3

In the third experiment, we examined the effect of knowledge of the number of lineup members on identification accuracy in sequential lineups not containing the guilty party.

Method

The confederate from Experiment 1 addressed three abnormal psychology classes in a lecture theatre, explaining that he was trying to recruit subjects for an experiment. After speaking to the class for about 60 s, the confederate introduced an experimenter and then left. The experimenter asked the students to participate in a study of facial recognition in which they would attempt to identify the confederate. In all three classes, photographs were projected on a screen at the front of the classroom, and the participants were informed that the confederate's picture "may or may not be present." Two classes were shown the lineup sequentially; one class ($N = 108$) was informed that there would be six pictures in the lineup, and the other class ($N = 73$) was not aware of the number of photos to be presented. A third class ($N = 73$) attempted the identification from a simultaneous lineup. The identification form in the sequential condition in which the number of lineup members was known had six spaces for responses, thus reinforcing the expectation of only six faces. In the sequential condition in which the number of faces was unknown, the form contained 12 spaces for responses. All subjects responded to every face regardless of when or whether they selected a face from the lineup. Only criminal-absent lineups were used in this study because correct identification rates were not significantly influenced by the use of simultaneous versus sequential identification procedures in previous studies (Experiment 1; Cutler & Penrod, 1988; Lindsay, 1990; Lindsay & Wells, 1985). Future studies might address possible effects of knowledge of the number of lineup members and sequential presentation on accurate identification of criminals.

Results and Discussion

False identifications of the innocent suspect occurred more when subjects were presented with a simultaneous lineup (27.4%) than when they were presented with a sequential lineup (12.7%), $Z = 2.83$, $p < .01$. False identifications occurred more often in sequential procedures if the number of lineup members was known (16.7%) rather than unknown (6.8%), $Z = 1.96$, $p < .05$. However, even this higher rate (16.7%) is significantly lower than the rate for the simultaneous lineup, $Z = 1.73$, $p < .05$. Correct rejections of the lineup were made nonsignificantly less often from the simultaneous lineup (38.4%) than from the se-

quential lineups overall (47.5%), $Z = 1.32$, $p < .10$. The rate of correct rejections from the simultaneous lineup (38.4%) was nonsignificantly lower than the rate of correct rejections from the sequentially presented lineup when the students were not aware of the number of faces to be seen (50.7%), $Z = 1.49$, $p < .07$. Although the results are less dramatic, overall accuracy was lower when the subjects were aware of the number of faces to be seen (45.5%) than when they were unaware (50.7%). The significantly increased rate of false identifications is a serious concern.

Conclusions

Sequential presentation of lineups, when witnesses do not know the number of lineup members and are not given the opportunity to choose again after the sequential presentation, substantially reduces false identifications of innocent suspects and increases correct rejections of criminal-absent lineups, but does not influence the rate of correct identification when the criminal is in the lineup. Allowing witnesses to attempt a second identification from the same set of faces presented simultaneously dramatically increased witness errors and only minimally increased correct identifications. Although a second sequential presentation did not produce similar detrimental effects, it did not significantly increase correct identification rates. As a result, there is no reason to allow witnesses a second opportunity to view a lineup. Even if such a procedure were used, it is certainly questionable whether courts should or would accept an identification of a suspect by a witness who moments before explicitly rejected the same person as being the criminal. Knowledge of the number of faces to be seen increased witnesses' false identification rate.

The results are consistent with the reasoning that relative judgment strategies are dangerous. Second opportunities to view a sequentially presented lineup allowed witnesses to compare each face with their memory for the already seen faces. In postexperimental discussions, subjects frequently commented that they failed to select anyone from a sequentially presented criminal-absent lineup because they weren't sure whether any of the faces they had seen was the correct one and hoped it was still to come. Obviously, this would not be the case if witnesses were shown the lineup twice. Similarly, the patience of witnesses (waiting for the guilty party to appear) is progressively reduced if they know the end of the lineup is approaching. This may result in a shift in criterion such that witnesses may be more likely to make false identifications of members presented late in the lineup (see Experiment 3).

The present results, in conjunction with replications of the sequential-presentation effect, greatly strengthen the case for recommending that police use sequential lineup procedures in which witnesses are not aware of the number of lineup members and are not allowed to examine the lineup again after the sequential presentation.

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