THE HYBRID LINEUP COMBINING SEQUENTIAL AND SIMULTANEOUS FEATURES: A FIRST TEST

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Eyewitnesses to a simulated crime attempted to identify the perpetrator from a six person lineup consisting of array sizes of one (sequential array), two (hybrid array), three (hybrid array), and six pictures (simultaneous array). The perpetrator was present in half of the lineups. The hybrid lineup procedure was tested against the sequential and simultaneous lineup procedures, comparing proportion of suspect identifications, lineup rejections, and foil identifications. The results indicate that hybrid array sizes were as good as sequential and better than simultaneous at correct rejections. The simultaneous procedure was superior in correct identifications, although in most cases the differences were not significant.

Wells, Small, Penrod, Malpass, Fulero, and Brimacombe (1998) reviewed the literature on eyewitness testimony and concluded that mistaken eyewitness identification is the cause of the majority of wrongful convictions of innocent people. In fact, they reported that of 40 cases that were exonerated through the use of DNA evidence, 36 involved the use of eyewitness identification evidence in which the person was erroneously identified. Many of those falsely convicted had served a large portion of their sentence

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before the verdict was overturned, losing years of their lives. Wells et al. (1998) went on to review the possible explanations for these eyewitness errors. One of the more prominent explanations concerned the procedures used by most police departments for conducting lineups. Wells (1984) argued that many of the eyewitness errors were due to lineup procedures where all the members of the lineup were displayed simultaneously. Wells explained that a witness viewing a simultaneous lineup makes a relative judgment when the witness compares lineup members to one another and then chooses the one that most resembles the eyewitness' memory of the perpetrator. In a recent study, evidence indicated that the use of relative judgments was associated with false identification of an innocent person, simply because the individual most resembles the person who committed the crime (Kneller, Memon, & Stenage, 2001). Due to these flaws in the current lineup procedure, a different type of procedure has been explored.

Lindsay and Wells (1985) devised a lineup technique that would minimize relative judgments and increase use of absolute judgments, a judgment made where each lineup member is compared only to the memory of the perpetrator. They hypothesized that if the total number of lineup pictures to be presented were broken up into a series of smaller arrays rather than being presented in one large array, witnesses would be less likely to make relative judgments. They suggested that a six-person lineup could be broken up into "… two sets of three, three sets of two, or six individuals presented sequentially" (p. 559). In the first test of their ideas, Lindsay and Wells opted for presenting the pictures sequentially, and this one-at-a time sequential approach has been used by the myriad of researchers who have followed.

In the first test of the sequential procedure against the simultaneous procedure, Lindsay and Wells (1985) found that when the perpetrator was absent from the lineup, the sequential lineup procedure decreased the number of incorrect identifications. When the perpetrator was present in the lineup, the simultaneous procedure produced a slightly greater number of correct identifications, although the difference was not significant. In a meta-analysis of all subsequent re-

search on the sequential lineup, Steblay, Dysart, Fulero, and Lindsay (2001) found that although sequential lineups generally decreased the chance of incorrect identifications in perpetrator absent lineups, simultaneous lineups produced more correct identifications in perpetrator present lineups. Although it was adopted by New Jersey in 2001, few police departments have adopted the sequential procedure (Lindsay, 1999), possibly because it does not increase rates of correct identification. It may be the case that the perceived rewards of using the sequential procedure do not outweigh the costs of having to retrain police departments. The criminal justice system is not likely to adopt a procedure that makes it less likely that a witness will identify a perpetrator who is in fact present in a lineup.

Even if police might be receptive to the use of a sequential lineup, psychologists have been leery about advocating it because of potential problems with demand characteristics. One of the main recommendations to law enforcement made by Wells et al. (1998) was that the officer conducting the lineup should be blind to the identity of the suspect; this would minimize the potential for the officer to influence the witness's choice by inadvertently or purposefully indicating which lineup member was the suspect. However, Wells et al. (1998) argued that if a blind procedure were not used, the sequential procedure might be particularly prone to such bias as the suspects are displayed one at a time. This was one of the reasons that they did not include sequential lineups in their recommended rules for lineup procedures. Phillips, McAuliff, Kovera, and Cutler (1999) later provided support for the Wells et al. (1998) concern about the impact of bias. Their research indicated that when a lineup administrator was aware of the suspect's identity, a biasing effect occurred in the sequential procedure, but not the simultaneous procedure. It would appear that a new procedure is needed which is at least as effective as the sequential procedure while reducing the danger of demand characteristics. A procedure that reduced the problem of false identification of the innocent while minimizing the potential demand characteristic bias would make the procedure more acceptable to the psychologists making recommendations to the criminal justice system. If this procedure also did not negatively impact cor-

rect identifications of the perpetrator, it would be more acceptable to the criminal justice system.

One possibility to correct this potential problem would be to try a different type of sequential lineup. In the past, sequential lineups have always shown pictures one-at-a-time following the original procedure used by Lindsay and Wells (1985). In spite of their choice of a one-at-time procedure, Lindsay and Wells (1985) did acknowledge the possibility of using subset sizes of two or three; the possibility of a two-at-a time or a three-at-time procedure has never been explored. There is some evidence that using more than one picture at a time might solve some of the problems with sequential procedures. McAllister, Michel, Tarcza, Fitzmorris, and Nguyen (2006) referred to a procedure with subsets of lineup pictures larger than one as a hybrid procedure that has both simultaneous and sequential elements. For example, breaking a lineup down into three subsets of two pictures and allowing only one subset to be shown at a time has the simultaneous feature of more than one picture being displayed at a time and the sequential feature of more than one set of pictures to be viewed. The sequential feature of the procedure could keep the witness from making relative judgments and hence reduce false positives. Just as in the typical sequential procedure, witnesses would not feel that they had to pick the best picture from this page because there would be subsequent pages to view. The simultaneous feature of the procedure might protect against potential biasing from an investigator who was not blind to suspect identity because the suspect's picture would appear on a page with one or two others, providing some degree of protection against inadvertent cues from the investigator. Further, given that simultaneous procedures have often produced more correct identifications of the perpetrator, the simultaneous feature might improve correct identifications.

The purpose of the current research was to analyze Lindsay and Wells' (1985) decision to test a sequential array size of one as opposed to an array size of two or three. In the present study, the hybrid lineups using array sizes of two and three were compared to sequential and simultaneous lineups. The number of pictures in each array was manipulated, as well as whether the perpetrator was

present or absent in the lineup. The number of pictures displayed per array consisted of four levels: arrays of one picture each (a sequential procedure), two pictures each (a hybrid procedure), three pictures each (a hybrid procedure), and six pictures (a simultaneous procedure). It was predicted that in perpetrator absent lineups, the hybrid lineup would be at least as effective as the normal sequential lineup and superior to the simultaneous lineup. For perpetrator present lineups, hybrid lineups were predicted to be at least as if not more effective than one-at-a time sequential lineups.

METHOD

Participants

There were 284 participants with even proportions of males and females in each of the eight conditions. Participants in the study included men and women of at least 18 years of age from a southeastern university's Introduction to Psychology classes.

Design

The experiment was a 2×4 design. Two variables were manipulated: (1) perpetrator presence (two levels); and (2) number of pictures displayed per array (four levels). The perpetrator presence variable consisted of two levels, perpetrator presence and perpetrator absence. In the perpetrator present condition the guilty suspect's picture was included in the array and in the perpetrator absent condition a picture of an innocent suspect of highly similar appearance was in its place. The number of pictures displayed per array consisted of four levels: arrays of one (sequential), two (hybrid), three (hybrid), and six pictures (simultaneous).

Materials

Stimulus Material. A video of a staged purse snatching was utilized as a stimulus. The video was about 30 seconds in length and depicted a college aged woman walking into a classroom followed by a college aged Caucasian male of medium build, with brown hair and brown eyes. The woman sat down and placed her purse on her desk, and the man then sat near her. The woman looked through the purse as the man eyed the purse. She then walked out of the room,

leaving her purse unattended on her desk. The man looked around, apparently to see if anyone was watching, and then grabbed the purse and dashed out of the room. At the point in the video when the man grabbed the purse, the video shows a clear frontal view of his face.

Lineup. Eighty-five pictures of college males were taken, displaying a frontal view from the shoulders up, against a uniform background. This was done at another campus to decrease the chances of participants recognizing any persons in the pictures. The pictures were taken of male students with eye color, hair color, and build similar to the perpetrator depicted in the video. Twelve pictures most similar to the perpetrator's picture were then chosen as foils based on a pretest of similarity conducted with 44 undergraduate raters. This lineup picture selection procedure was done in accordance with the suspect-matched lineup procedures utilized by Lindsay, Martin, and Webber (1994).

Measures of Processing. At the end of the identification procedure, participants completed several scales. The first scale assessed the type of judgment strategy the participant used. The instructions described two different strategies that a witness might use in attempting an identification: an absolute or relative strategy. Participants were asked which method best described the strategy they used on a 7-point scale (1= absolute only; 7= relative only). Participants were also asked to use a 7-point scale to rate their confidence in their selection decision (1 = not at all confident; 7 = completely confident). The amount of time it took for the participant to complete the first six pictures of the lineup was also measured by a timer built into the computer program which started as soon as the participant viewed the picture and stopped when a decision was made.

Procedure

A maximum of five participants completed the experimental protocol at one time. When participants entered the lab, they were instructed to watch a video and pay careful attention to social interactions. These instructions were intended to focus participants on the actors in the scene. Participants then watched a video depicting a purse snatching. Next, participants were told that they would be asked to identify the perpetrator from a lineup in which he may or

may not appear. They were separated into individual cubicles and after a 30 minute delay during which students looked at magazines, they participated in an identification process. The delay was included to maximize resemblance of the study to real world conditions in which witnesses do not participate in a police lineup immediately after viewing a crime. Following the delay, participants were randomly assigned to either perpetrator present or absent conditions, and one of the four array sizes. All conditions were counterbalanced for the position of the perpetrator's picture (or the picture of the innocent suspect of highly similar appearance, in the perpetrator absent condition) in the lineup, to address possible order effects. In all array conditions the target picture (the guilty or innocent suspect) either appeared early in the lineup (the second picture shown) or late in the lineup (the fifth picture shown).

Participants were placed in front of a computer screen and told that they would see a total of 12 pictures (except in the simultaneous condition, where they were told they would see 6 pictures). Although three of the conditions allowed participants to view 12 pictures, the last six pictures were merely fillers. Similar to Lindsay and Wells (1985) the purpose of the fillers was to remove any tendency to select the last picture(s). When viewing the last real lineup picture it was important that participants believe that there would be more pictures to come. Participants were also presented with instructions on the computer screen. The instructions for each condition differed depending on the number of photos shown per screen. The instructions for the sequential condition, with array sizes of one, were as follows:

> Just as in a real police lineup, you must now attempt to identify the person who you saw steal the purse in the video. He may or may not appear in the lineup. You are about to view 12 pictures of male college aged students. One picture will be presented on each page. Below the picture are "yes" and "no" buttons. If you believe the person in the picture is the perpetrator you saw in the video, use your mouse to click on the "yes" button. If you do not think the person in the picture is the perpetrator from the video, use your mouse to click

> on the "no" button. You will not be allowed to return to the picture after a judgment is made. If you have any questions, please ask the experimenter now. Otherwise, click on the "begin" button to start the experiment.

The instructions for the hybrid and simultaneous arrays were similar to the instructions above, but differed in reference to the number of pictures to be shown on each screen. Another difference in the instructions was the response option provided for identification decisions. For the sequential condition, participants responded by selecting either a "yes" or "no" button for each picture. For the other conditions, participants selected the number that corresponded with the picture they believed was the suspect. If they did not believe the perpetrator's picture was present, they also had the option of selecting the "none" button. The instructions for the simultaneous array differed from the other three conditions in that participants were told that they would view 6 pictures rather than 12.

Picture presentation varied by condition. In the sequential condition, one picture appeared in the middle of the screen with a "yes" and "no" button below it. Once a decision was made, the next screen appeared with the next picture, continuing until all 12 pictures had been displayed. In the hybrid conditions, two or three pictures were shown in the middle of the screen with corresponding numbers, 1 and 2 or 1 through 3, below them. Participants were instructed to select the number corresponding to the picture of the perpetrator, or to select the "none" button if they did not believe the perpetrator's picture was displayed. The simultaneous condition followed in the same manner, with a single screen presenting six numbered pictures. All pictures presented from each condition were of the same size despite the number of pictures appearing on the screen.

During the identification process, the experimenter left the cubicle and stood in the hallway. After identification was completed, questions regarding decision strategy and decision confidence appeared on the computer screen.

RESULTS

Although three of the conditions allowed participants to view 12 pictures, the last 6 pictures were fillers; thus, only responses to the first 6 pictures (which were the same pictures appearing in the simultaneous lineup) were analyzed. Preliminary analyses indicated that the early or late position of the lineup did not affect eyewitness performance; therefore, this variable was excluded from the subsequent analyses.

Identification Analysis Perpetrator Absent

In these conditions, the suspect was innocent; thus, an identification of the suspect would be a false positive. Although this measure is straightforward for the simultaneous procedures, it is more complicated for the sequential and hybrid procedures. The current research allowed those using the sequential and hybrid procedure to continue viewing pictures even if they selected a foil before reaching the suspect. In keeping with the way this problem has been handled in the past (e.g., Lindsay & Wells, 1985), an identification of a foil followed by a later identification of the suspect was counted as a foil identification rather than a suspect identification. In essence the data are treated as though the lineup ended when a choice was made. It should be pointed out that contrary to the typical laboratory experiment, not all jurisdictions/departments stop when the witness makes a selection. The National Institute of Justice's Technical Working Group for Eyewitness Evidence (1999, 2003) has not taken a strong position on this issue; they basically have left the decision to be made jurisdiction by jurisdiction. However, they do point out that whether the decision is made to continue until all pictures have been viewed or to stop as soon as a selection is made, a fixed technique should be followed. If the investigator sometimes stopped and yet other times went to the end, a case could be made for bias.

To examine whether identification decisions varied as a function of array size, chi-square analyses were conducted on identification decision (innocent suspect identification, lineup rejection, or foil identification). There was a significant effect of array size on the pattern of identification decisions, $\chi^2(6, N=297) = 30.37$, $p < .001$. The proportions of decisions can be seen in Table 1. Follow-up

pairwise chi-square analyses were performed to compare array sizes with one another for innocent suspect identification, lineup rejection, and foil identification. None of the arrays was significantly different from any of the others in the proportion of identifications of the innocent suspect. For correct rejections, the simultaneous lineup (array size 6) had significantly fewer correct rejections than the other three array sizes: (a) the sequential lineup (array size 1), $\chi^2(1, N=297) = 19.82$, $p < .001$, (b) the hybrid lineup (array size 2), $\chi^2(1, N=297) = 12.99$, $p < .001$, and (c) the hybrid lineup (array size 3), $\chi^2(1, N=297) = 9.48$, $p < .01$. For identifications of foils, the simultaneous lineup (array size 6) had significantly greater numbers of foil identifications than the other three array sizes: (a) the sequential lineup (array size 1), $\chi^2(1, N=297) = 16.37$, $p < .001$, (b) the hybrid lineup (array size 2), $\chi^2(1, N=297) = 15.81$, $p < .001$, and (c) the hybrid lineup (array size 3), $\chi^2(1, N=297) = 10.44$, $p < .01$

Identification Analysis Perpetrator Present

In these conditions, the suspect was guilty; thus, an identification of the suspect would be a correct identification. Similar to the previous analysis, an identification of a foil followed by a later identification of the guilty suspect was counted as a foil identification rather than a correct identification. Again, the data are treated as though the lineup ended when a choice was made.

To examine whether identification decisions varied as a function of array size, chi-square analyses were conducted on identification decision (guilty suspect identification, lineup rejection, or foil identification). There was a significant effect of array size on the pattern of identification decisions, $\chi^2(6, N=297) = 12.72$, $p < .05$. The proportions can be seen in Table 1 [page 100]. Follow-up pairwise chi-square analyses were performed to compare array sizes with one another for guilty suspect identification, lineup rejection, and foil identification. The hybrid lineup (array size 3) had significantly fewer correct identifications of the guilty suspect than the simultaneous lineup (array size 6), $\chi^2(1, N=297) = 6.68$, $p < .05$. None of the other comparisons was significant. For lineup rejections, the simultaneous lineup (array size 6) had significantly fewer incorrect lineup rejections than: (a) the sequential lineup (array size

Table 1
Proportions of Suspect Identification, Lineup Rejection, and Foil Identifications as a Function of Array Size and Perpetrator Presence or Absence

	Array Size			
Condition	1 (Sequential)	2 (Hybrid)	3 (Hybrid)	6 (Simultaneous)
Perpetrator Absent				
Suspect Identification	.00a	.08a	.06a	.05a
Lineup Rejection	.87a	.79a	.75a	.38b
Foil Identification	.13a	.13a	.19a	.56b
Perpetrator Present				
Suspect Identification	.14ab	.16ab	.03b	.23a
Lineup Rejection	.62a	.65a	.72a	.38b
Foil Identification	.24a	.19a	.25a	.38a

Note. Within each row proportions not sharing a common subscript are significantly different ($p < .05$) from each other.

1), $\chi^2(1, N=297) = 4.27$, $p < .05$, (b) the hybrid lineup (array size 2), $\chi^2(1, N=297) = 5.30$, $p = .021$, and (c) the hybrid lineup (array size 3), $\chi^2(1, N=297) = 8.61$, $p < .01$. In terms of identifications of foils, none of the conditions were significantly different from any of the other conditions.

Analysis of Time, Confidence, and Judgment Strategy

Decision time was measured from the point at which the first picture was presented to the point at which the decision on the first six pictures had been made. Even if a participant in the sequential or hybrid procedures selected a picture before the sixth picture, timing continued until the judgment was made on the sixth picture. A univariate ANOVA was conducted to determine the effect of array size and perpetrator presence on decision time. There was a trend for an effect for array size, $F(3, 289)= 2.64$, $p=.05$. As can be seen in Table 2 [page 101], more time was taken in the six-picture array simultaneous condition than the other three conditions; however, post hoc Tukey HSD tests revealed that no condition was significantly

different from any other, although there was a trend for a difference between the simultaneous and sequential conditions ($p < .06$).

Table 2
Mean Decision Time, Confidence, Relative Judgments, and Holistic Judgments as a Function of Array Size

Measure	Array Size			
	1 (Sequential)	2 (Hybrid)	3 (Hybrid)	6 (Simultaneous)
Decision Time	26.71 a	27.83 a	28.68 a	36.37a
Confidence	4.35 ab	4.06 a	3.85 a	4.70 b
Relative/Absolute Judgment	2.66 a	2.95 a	2.46 a	2.82 a

Note. Within each row those not sharing a common subscript are significantly different ($p < .05$) from each other. Confidence scores ranged from 1(not at all confident) to 7 (completely confident). Relative/Absolute scores ranged from 1 (absolute only) to 7 (relative only).

A similar ANOVA was conducted to determine whether array size and presence of the perpetrator affected confidence. A significant effect was found for array size, $F(3, 289)= 9.85$, $p < .01$. As can be seen in Table 2 [below], participants in the simultaneous condition were more confident than in the other three conditions. Post hoc Tukey HSD tests revealed that those in the two hybrid conditions were significantly lower in confidence than those in the simultaneous condition, but were not significantly different from the sequential condition. Those in the sequential condition were not significantly different in confidence than those in the simultaneous condition.

An ANOVA was conducted to determine whether array size and presence of the perpetrator affected use of absolute/relative judgments. No significant effects were found. The means can be seen in Table 2.

DISCUSSION

The primary purpose of the current research was to test sequential lineup procedures using array sizes larger than the array size of one used by Lindsay and Wells (1985). It was thought that arrays of size two or three might combine some of the strengths of both the simultaneous and sequential procedures while minimizing their weaknesses. McAllister et al. (2006) proposed such a hybrid procedure; however, the current investigation is the first to empirically test the hybrid lineup performance relative to the standard sequential and simultaneous lineups. The results showed that the performance of witnesses viewing a hybrid lineup was similar to the performance of those viewing the sequential lineup; in contrast there were marked differences between hybrid lineup and simultaneous lineup performances.

Lineup Accuracy

As predicted, the hybrid procedure produced fewer errors than the simultaneous procedure in lineups where the perpetrator was not present. Correct rejections of the lineup were significantly more likely in the two hybrid conditions than the simultaneous condition and comparable to the rate in the sequential lineup. Incorrect selection of an innocent foil was significantly more likely to occur in the simultaneous lineup relative to the hybrid lineups which again showed similar results to the sequential procedure. However, on the measure of identification of the innocent suspect there were no differences in the four lineup conditions. The results for the sequential and simultaneous lineups are consistent with past research. Steblay et al. (2001) reported in their meta-analysis that the sequential lineup was superior to the simultaneous lineup in correct rejection rates, false identifications of an innocent suspect, and foil identifications; the current research replicated the first two of the three effects. What is most interesting about these findings is that the hybrid lineups which have a sequential aspect in common with the standard sequential lineup showed the same superiority to the simultaneous presentation. Thus, the sequential superiority effect in perpetrator absent lineups appears to extend to hybrid procedures using array sizes of two and three pictures.

It had been hoped that the hybrid procedure would also prove to be superior to the simultaneous procedure in perpetrator present lineups; however, that did not prove to be the case. All three lineups with sequential aspects produced fewer correct identifications of the perpetrator than the simultaneous lineup, although this difference was only significant in the case of the hybrid lineup (array size 3). The finding of fewer correct identifications in sequential procedures as compared with simultaneous procedures is consistent with the findings of the Steblay et al. (2001) meta-analysis.

In summary of the lineup accuracy findings, hybrid array sizes of two and three produced results in both perpetrator present and perpetrator absent lineups that were essentially the same as the standard sequential lineup using an array size of one. Both hybrid and sequential lineups are superior to the simultaneous lineup when the perpetrator is absent from the lineup; however, when the perpetrator is present they are slightly worse in correct identifications.

Underlying Decision Process

It had been predicted that participants viewing both hybrid and sequential lineups would report greater use of absolute judgment strategies than those viewing simultaneous lineups; however, there was no support for this in the current research. We found no significant differences for absolute/relative judgments. It may be the case that participant self-report of these phenomena is unreliable and should be examined by other means. One indirect measure of the type of processing being used during identification is the time taken to make an identification decision. Smith, Lindsay, and Pryke (2000) found that the use of a relative judgment strategy is positively related to decision time. The trend for an increase in decision time as the lineups became more simultaneous may be a function of the use of a relative judgment strategy by the eyewitness. This argument would have been stronger if some of the post hoc comparisons had been significant.

It should be pointed out that there are explanations for the differences between simultaneous and sequential lineups other than differences in relative judgments. Ebbesen and Flowe (2002) argued that the sequential lineup procedure merely causes witnesses to raise

their response criterion. They give a signal detection explanation of how this could result in a reduction in false positives and somewhat smaller reduction in correct identifications. These are of course the results found here for all of the sequential procedures. Although eyewitness experiments do not lend themselves to direct tests signal detection theory due to the single witnessed event, Meissner, Tredoux, Parker, and MacLin (2005) recently devised a procedure involving multiple targets that provides the first real test Ebbesen and Flowe (2002). Meissner et al. (2005) found support for the Signal Detection Theory predictions. Meissner et al. (2005) went on to explore the underlying cognitive processes. Research on dual process models of memory has shown that shifts in criterion are associated with changes in familiarity processes but not with recollection (Yonelinas, 2002). Meissner et al. (2005) were able to estimate the contributions of familiarity and recollection; they found reduced use of familiarity judgments in sequential procedures as compared to simultaneous procedures. They did not find support for differences between simultaneous and sequential lineups in recollection; this finding is contrary to Gronlund (2005) who argued that the sequential advantage was based on improved recollection. Future research, perhaps with the Meissner et al. (2005) procedure, could test whether the hybrid lineup, like the sequential lineup, reduces the use of familiarity as the basis for lineup decisions.

Although we had no firm predictions concerning the effects of the hybrid procedure on confidence, there were interesting effects. We found that individuals viewing the simultaneous lineups reported higher confidence in their decisions than in the hybrid array sizes and did not differ significantly in comparison to the sequential array size one. One possible explanation for our confidence findings concerns the relationship between choosing and confidence. Kneller, Memon, and Stevenage (2001) found that those who make a choice in a lineup report being more confident than nonchoosers. Since there was a much higher level of choosing in the simultaneous condition as compared to the other three conditions, it is possible that this contributed to the greater confidence. This is an important issue due to the fact that jurors often determine whether or not a

witness is accurate by seeing how confident they are. But, it is not unusual to find that accuracy and confidence are not highly related (Lindsay & Bellinger, 1999; Sporer, 1993; Wells et al., 1998). This could be due to the fact that participants were more comfortable with the simultaneous method because it is the method that they have had the most experience with through television shows of lineups or lineups in general.

CONCLUSION

Based on the current findings taken in conjunction with the state of the literature, it is not yet clear which lineup procedure is best. If correct identifications are considered to be most important, then the simultaneous procedure may be the procedure of choice. If correct rejections are most critical, then the hybrid or sequential procedures should be chosen. Additional aspects of the hybrid, sequential, and simultaneous lineup procedures need to be examined before a final decision about the superiority of an individual procedure can be made. For example, an empirical investigation manipulating whether the investigator is blind or not to the suspect's identity would provide additional useful information regarding the advisability of using these procedures. One of the proposed advantages of the hybrid procedure over the sequential array-size-one procedure is that it should be less vulnerable to cues from an investigator who is not blind to the suspect. The presence of a single suspect in the sequential array-size-one procedure may allow the person conducting the lineup to indicate to the witness, either purposely or accidentally, who the suspect is in the lineup. Inadvertent or purposeful nonverbal communication, such as a head nod, would much more easily communicate the identity of the suspect in the sequential procedure than in the simultaneous or hybrid procedures in which multiple suspects are present at any one time. In order to overcome this problem with the sequential procedure, the person conducting the lineup would have to be blind to the suspect's identity, which is not likely in a police lineup scenario. The problem of contamination of the sequential procedure by a lineup administrator being aware of which lineup member is the suspect is the reason Wells et al. (1998) did not sug-

gest its use in their lineup guidelines, and was later confirmed by Philips, McAuliff, Kovera, and Cutler (1999).

One limitation to the current research involves the low rates of identification of the perpetrator. The Steblay et al. (2001) meta-analysis of 22 experiments using perpetrator present lineups found that correct identifications of the perpetrator were made by 50% of the witnesses viewing simultaneous lineups and 35% of those viewing sequential lineups. In contrast, in the current research only 23% of the witnesses viewing a simultaneous lineup and 14% viewing a sequential lineup correctly identified the perpetrator. This might suggest that the stimuli used in the current research differs from what is typically used, e.g., the viewing conditions for the crime were more difficult than typically used or the perpetrator was not as memorable as those typically used. Future research using different stimulus material would be an advisable next step in the process of exploring hybrid lineups.

This research has provided yet more support for the position that sequential procedures are superior to simultaneous procedures in lineups where the perpetrator is absent, but at some cost in correct identifications of a guilty suspect. What is important about the current research is that for the first time it has been demonstrated that these exact same effects are found when the sequential lineup uses array sizes larger than the standard one picture per array. Based on the findings of the current study, it would seem that a hybrid lineup procedure using a larger array size offers a viable alternative to the six person, simultaneous lineup and is worthy of further investigation.

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