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The Selection of Distractors for Eyewitness Lineups

Gary L. Wells, Sheila M. Rydell, and Eric P. Seelau

Thefts were staged for 252 eyewitnesses using seven different confederate thieves. Photospreads were constructed for each eyewitness to test a proposal regarding strategies for selecting lineup distractors (C. A. E. Luus & G. L. Wells, 1991). Distractors were selected to resemble a suspect or to match the eyewitness's description of the culprit. A mismatch-description strategy was included for comparison and contrast with the other two strategies. The match-description strategy produced both a low false-identification rate and a high accurate-identification rate. The mismatch-description strategy was unable to hold down false-identification rates, and the resemble-suspect strategy failed to secure acceptable rates of accurate identification. The match-description strategy captures the best features of the mismatch-description and resemble-suspect strategies without also capturing their worst features.

negative control

(results)

A good lineup task is one that minimizes the likelihood that an innocent suspect will be (falsely) identified and maximizes the likelihood that a guilty suspect will be (accurately) identified. It is now clear from experimental research using staged crimes that there are instructional, procedural, and structural variations in lineups that have substantial effects on these likelihoods (e.g., Cutler & Penrod, 1988; Lindsay & Wells, 1980; Malpass & Devine, 1981; Wells, 1984; Wells & Turtle, 1986). The general approach has been to systematically vary the method of conducting or constructing a lineup and observe the resultant rates of accurate and false identifications.

Experimental research on how to improve lineups began in the 1970s and progressed rapidly in the 1980s (see Wells, 1993). Throughout the 1980s there have been clear demonstrations of the fact that false-identification rates and accurate-identification rates are not mere trade-offs as a function of variations in the lineup task. In other words, it is possible to construct a lineup that can reduce false-identification rates without producing comparable losses in accurate-identification rates (Lindsay & Wells, 1980). The sequential lineup, for example, when contrasted with the traditional simultaneous lineup, reduces the likelihood of false identification with little loss in the likelihood of accurate identification (see Cutler & Penrod, 1988; Lindsay & Wells, 1985). The goal of finding lineup-identification methods that can reduce false-identification rates without damaging accurate-identification rates has dominated the conceptual and operational approach of eyewitness-identification theorists. This approach has been quite fruitful in yielding conceptual models and concrete methods for improving lineups.

founding truth upon which the paper proceeds

Improvements to lineups can be placed in three categories: instructional improvements, procedural improvements, and content improvements. Instructional improvements include, for example, warnings to eyewitnesses that the lineup might or might not include the actual culprit (Malpass & Devine, 1981). Procedural improvements include such methods as the use of two lineups rather than one (Wells, 1984) and the use of sequential presentations of lineup members rather than simultaneous presentations of suspects (e.g., Cutler & Penrod, 1988; Lindsay & Wells, 1985). Content improvements refer primarily to the question of how to select distractors for a lineup (e.g., Brigham & Ready, 1985; Doob & Kirshenbaum, 1973; Lindsay & Wells, 1980; Luus & Wells, 1991; Malpass, 1981; Wells, Leippe, & Ostrom, 1979; Wells & Lindsay, 1980; Wells & Turtle, 1986).

The current article addresses the question of how to best select distractors for lineups. In general, the psychological literature has argued that the distractors in a lineup should match the description of the culprit that was given previously by the eyewitness who will view the lineup (e.g., see Doob & Kirshenbaum, 1973; Malpass & Devine, 1981; Wells et al., 1979). Indeed, empirical data support the contention that the use of distractors who do not match the eyewitness's description of the culprit serves to inflate rates of false identification (Lindsay & Wells, 1980). There is no serious debate about the inadvisability of selecting distractors who fail to match the eyewitness's prelineup description of the culprit (*mismatch-description strategy*). In recent years, however, numerous authors of chapters and articles about eyewitnesses have stated that a proper distractor is one who resembles the suspect (as opposed to matching the eyewitness's description of the culprit). The distinction between selecting distractors according to a resemble-suspect strategy as opposed to a match-description strategy has recently been addressed (Luus & Wells, 1991).

The general argument put forth by Luus and Wells (1991) was that the resemble-suspect strategy promotes unnecessary or gratuitous similarity between distractors and the suspect. Clearly, some variation of the physical appearance of lineup members is required for the eyewitness to be able to make a meaningful identification; imagine, for example, a lineup in which a suspect is embedded among the suspect's clones. At some point, seeking homogeneity in the appearance of lineup members makes the task of identification functionally impossi-

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ble by eliminating the perceptual cues that are necessary for the successful operation of recognition memory (Gibson, 1969).

The logic behind the resemble-suspect strategy is that it should serve well to protect an innocent suspect. We have no doubts about the efficacy of the resemble-suspect strategy for protecting innocent suspects, but we argue that such protection is achieved through a loss in accurate identifications. The match-description strategy, on the other hand, should serve equally as well as the resemble-suspect strategy in protecting an innocent suspect. Unlike the resemble-suspect strategy, however, the match-description strategy should also allow for helpful differences, or propitious heterogeneity, across lineup members, which in turn should promote accurate identifications.

Luus and Wells (1991) concluded that the match-description and resemble-suspect strategies for selecting lineup distractors have profoundly different consequences. Their arguments, however, are purely theoretical at this time as there are no data comparing the two strategies. The current experiment is the first to test these two strategies. We included a mismatch-description condition to assess the extent to which the resemble-suspect and match-description strategies served to protect the innocent suspect relative to an obviously biased lineup. We predicted that the resemble-suspect strategy would suffer from low rates of accurate identification, that the mismatch-description strategy would suffer from high rates of false identification, and that the match-description strategy would do relatively well in attaining both high accurate-identification rates and low false-identification rates. The next two sections lay the foundation for our predictions.

Assumptions and Definitions

In our theoretical framework, we assumed that a lineup contains a single suspect and that the remaining members are distractors (Wells & Turtle, 1986). A distractor is not a suspect and, therefore, distractors are known innocents who are not at risk of being incriminated by the eyewitness (Lindsay & Wells, 1980). For this reason, an eyewitness's identification of a distractor was not defined as a *false identification* in the forensic sense of this term. Although a distractor identification is an identification error, we reserved the term *false identification* for instances in which the eyewitness identified the lineup's sole suspect when the suspect was not the actual culprit.

It is critical here to not confuse the terms *suspect* and *culprit*. The suspect might or might not be the culprit (i.e., actual perpetrator); that is the very question that one is trying to answer by conducting the lineup. Hence, when a lineup is constructed by police, the lineup is either of the culprit-present or culprit-absent type (see Table 1). Note that a false identification (in the forensic sense defined earlier) cannot occur if the suspect is the culprit (i.e., in a culprit-present lineup). Although the eyewitness can identify a known-innocent distractor regardless of whether the suspect is the culprit, a false identification can occur only when the suspect is not the culprit (i.e., in a culprit-absent lineup). Of course, the presence or absence of the culprit is unknown in actual cases, whereas in experiments this is a factor in the experimental design.

Table 1 is useful for noting that distractor identifications can represent either lost opportunities for obtaining a *hit*, or accurate identification of the culprit in a culprit-present lineup, or can represent protection against a false identification, or identification of an innocent suspect in a culprit-absent lineup. Along these lines, it is reasonable to argue that the selection of distractors who too closely resemble the suspect in a culprit-present lineup will reduce hit rates and promote distractor identifications. It is also reasonable to argue that the selection of distractors who look nothing like the suspect in a culprit-absent lineup will increase false-identification rates because such distractors do not constitute adequate lures to draw choices away from the suspect. Hence, distractors who should serve in the lineup must be selected on the basis of their ability to "hide" the suspect if the suspect is not the culprit while allowing the suspect to "stand out" for the eyewitness if the suspect is the culprit.

Table 1
Possible Outcomes From Conducting a Lineup

	Identification		
Lineup type	Suspect	Distractor	No identification
Culprit present	Hit	Known error	Miss or incorrect rejection
Culprit absent	False identification	Known error	Correct rejection

Resemble-Suspect Strategy Versus Match-Description Strategy

The preceding points allow exploration of the theoretical and practical aspects of selecting distractors who resemble the suspect versus selecting distractors who merely match the eyewitness's prelineup description of the culprit. One difficulty with the resemble-suspect strategy is that there is no criterion for deciding when the strategy has been adequately executed. How much resemblance is enough? When is resemblance too great? At what point is similarity merely gratuitous? Should the distractors resemble the suspect in facial hair, hair color, mouth shape, skin tone, and angularity of the chin? If so, should they also resemble the suspect in eye shape, eye color, cheekbone height, ear protrusion, nose shape, bushiness of brows, and so on? Clearly, there is some point at which the resemble-suspect strategy would produce a lineup of functional clones. At that point a perceiver cannot make the perceptual discriminations that are essential to successful operation of human recognition memory.

The match-description strategy, on the other hand, has a clear criterion for deciding when the strategy has been adequately executed. Descriptors used by eyewitnesses tend to be approximations (e.g., "he was 6 ft 1 in. to 6 ft 4 in.") and limited in number (e.g., see Pigott & Brigham, 1985; Wells, 1985). A typical description might be "he was a male, white, about 5 ft 8 in., maybe 5 ft 10 in., dark hair, a mustache, and maybe 175–190 lbs." Therefore, as long as the distractor does not violate this description, the match-description criterion has been met. Luus and Wells (1991) argued that there is no reason to believe that additional homogeneity in appearance would produce any additional protection for the innocent suspect as long as each distractor matches the description of the culprit.

The purpose of distractors is not to confuse the eyewitness

the whole point of distractors

goal of distractors in a eyewitness match lineup- to increase heterogeneity

but to reduce the role of extra-recognition influences on the identification process. By *extra-recognition influences* we mean those processes that can lead to an identification that are not the product of true recognition memory, such as guessing or deductive reasoning. For example, if an eyewitness views a lineup and sees only one person who matches the description of the culprit that was given to police, the eyewitness might deduce that this is the person whom the police suspect of being the culprit. If the eyewitness also assumes that the culprit is somewhere in the lineup—perhaps because of a belief that police do not conduct a lineup unless they have strong evidence against the lineup's suspect—the eyewitness might reach a conclusion that the person who matches the description must be the culprit. As a result, an eyewitness might identify a lineup member on the basis of the description rather than on the basis of recognition memory (Brigham & Ready, 1985; Doob & Kirshenbaum, 1973; Lindsay & Wells, 1980; Luus & Wells, 1991; Malpass & Devine, 1981; Wells et al., 1979).

Having each member of the lineup match the eyewitness's prelineup description of the culprit helps control for extra-recognition influences of this type. Under these conditions, an eyewitness can no longer rely on simply recalling what was said to police about what the culprit looked like; the eyewitness must use recognition memory to retrieve information that was unavailable in recall. Luus and Wells (1991) argued that selecting lineup members who each match the eyewitness's description of the culprit is adequate to prevent these extra-recognition influences and that attempts to further increase similarity between distractors and the suspect serve merely to confuse the recognition process. As long as all lineup members match the eyewitness's prelineup description of the culprit, in what sense can the lineup be said to be biased against the suspect?

a very good point to be noted in the practical world

In general, the hypothesis is that the resemble-suspect strategy creates gratuitous similarity, going well beyond what is needed to protect an innocent suspect and serving to hide a guilty suspect. The match-description strategy, on the other hand, makes the lineup members similar only at the level of being consistent with the eyewitness's description of the culprit and allows for lineup members to vary on features that were not part of that description. In spite of seemingly strong arguments favoring the match-description strategy over the resemble-suspect strategy for selecting distractors, it remains to be determined empirically whether or not the match-description strategy will promote higher accurate-identification rates than will the resemble-suspect strategy. It also remains to be determined whether or not the increased heterogeneity across lineup members that results from the match-description strategy relative to the resemble-suspect strategy is somehow harmful to the protection of the innocent suspect in a culprit-absent lineup.

There are clear criterion differences between the two strategies. The resemble-suspect strategy uses the physical appearance of the suspect (whether guilty or innocent) as the criterion for selecting distractors, whereas the match-description strategy uses the eyewitness's description of the culprit as the criterion. In the current study we have taken the match-description strategy one step further. Rather than merely settling for a set of distractors who match the eyewitness's description of the culprit, a larger-than-needed set of such distractors was selected and a second criterion was used to select among the set. The second criterion was one of maximizing differences in the physical appearance of the lineup members. This second criterion was intended to further increase heterogeneity across lineup members in the match-description condition, thereby allowing a strong test of whether such heterogeneity is propitious, as Luus and Wells (1991) contended, or harmful.

Figure 1 is offered as a concrete example of the kinds of differences that surface when selecting distractors according to the three strategies. Suppose that an eyewitness describes a perpetrator as a White female, 20–24 years of age, with long light-brown hair, and from about 5 ft 2 in. to 5 ft 5 in. tall. Suppose further that the person in the upper-left quadrant of Figure 1 is the suspect. Using a mismatch-description strategy, the person in the lower-left quadrant might be selected as a distractor. The match-description and resemble-suspect strategies, however, would reject the person in the lower-left quadrant because she fails to match the description and does not resemble the suspect as much as does the person in the upper-right quadrant. Although the persons in the upper-right quadrant and in the lower-right quadrant match the description, the resemble-suspect strategy would prefer the person in the upper-right quadrant because she closely resembles the suspect in overall appearance. The match-description strategy, on the other hand, would favor selection of the person in the lower-right quadrant as a distractor because she matches the description but does not otherwise resemble the suspect in overall appearance.

Method

Overview

During this study, which was ostensibly concerned with people's perceptions of events, 252 subjects became unsuspecting witnesses to staged thefts of a cash box. Individual photospread lineups were constructed for each of the 252 eyewitnesses. A unique lineup had to be constructed for each eyewitness because the match-description and mismatch-description strategies hinge on the individual eyewitness's description of the culprit, as do choices of who should serve as the innocent suspect in culprit-absent lineups. Seven different confederates served as thieves, each serving 36 times. The use of seven different confederate culprits allowed us to test whether or not the effect of distractor-selection strategies generalizes across targets. After obtaining descriptions of the thief from each eyewitness, we randomly assigned eyewitnesses to one of six conditions in a 2 (culprit present vs. absent in lineup) × 3 (distractors resemble suspect vs. distractors match description vs. distractors do not match description) factorial design. The suspect who replaced the culprit in each of the culprit-absent lineups was selected to match the eyewitness's description of the culprit. Instructions emphasized that the thief might or might not be in the photo spread. After making an identification decision, each eyewitness was asked how certain she or he was that the decision was correct.

Participants

Male and female undergraduate students ($N = 252$) enrolled in introductory psychology courses at a large midwestern university volunteered to participate in this experiment in exchange for extra course credit.

Materials

The experimenter constructed a unique photospread for each participant based on the description of the thief provided by that participant. Seven different confederates assumed the role of thief: two White males,

Figure 1. Example of a suspect and distractors from each of the three distractor conditions.

two White females, two African-American females, and one Asian-American male. Distractor photo sets were developed specifically for this experiment for each of the seven confederate culprits. This was done by searching libraries and other public areas for people who resembled the confederate, for people who matched a general description but otherwise did not resemble the confederate, and for people who were of the same race and gender as the confederate but otherwise would not match a description of the confederate. People meeting these criteria were then paid to have their photographs taken under controlled conditions, resulting in sets of approximately 30 photographs per confederate culprit.

Each photospread consisted of a single suspect photo, placed in Position 3 in the photospread, and five distractor photos. In culprit-present conditions the actual thief served as the suspect, whereas in culprit-absent conditions a replacement was chosen. To choose a replacement, the experimenter examined the description of the thief provided by the participant and selected the first photo found among the set that fit the description. Photos were frequently shuffled, but were not systematically randomized. Such shuffling introduces the possibility of experimenter bias in selecting innocent suspects, an issue we address in our analyses of obtained configurations in our Results section.

Distractors were selected by one of three procedures corresponding to the three lineup-construction techniques. In the mismatch-description conditions, each distractor violated the participant's description on at least one major feature (e.g., the distractor had black hair, whereas the thief was described as having blond hair). In the resemble-suspect conditions, the five photos that most resembled the suspect's photo were selected as distractors. In the match-description conditions, all photos that violated the description were disregarded. From the remaining photos, the five that least resembled the suspect were selected as distractors.

Procedure

Participants in group sizes that ranged from one to four were met by the experimenter at the time and place indicated on sign-up sheets and were brought to the experiment room. This suite of rooms consisted of a waiting area, a "control" room where materials were kept, and four smaller rooms. Participants were seated in the waiting area to complete consent forms that described the study as one of perceptions of events.

After participants completed the consent forms, the experimenter proceeded to "set up" the theft. The experimenter told the participants that several people from the community were being paid to participate in the study and that one such participant was just completing materials in one of the back rooms. The experimenter explained that it was necessary to collect the materials and pay that participant before beginning the next session.

Attempting to open the door to the control room, which contained the cash needed to pay the community participant, the experimenter acted surprised to find that it was locked. The experimenter stated that she or he would have to get a key to the control room to enter the room and get the money to pay the community participant. Apologizing for the delay, the experimenter exited to the left through the front door.

About 10 s after the experimenter left, a confederate playing the role of the thief burst out of the control room carrying a small cash box. The thief looked surprised and dropped the box, spilling a wad of bills and some change onto the floor. The thief picked up the money and quickly exited the room in the direction opposite to where the experimenter had exited.

The experimenter returned and, if participants did not volunteer any information, inquired as to who had opened the control-room door. Before participants could give a description of the thief, the experi-

menter revealed that the theft had been staged as part of an experiment on eyewitness memory.

Each participant was taken to a separate room and given a blank form that contained instructions to provide a written description of the thief. In the instructions, witnesses were asked to list anything that they could remember about the thief's physical characteristics (such as face, hair, and age) that might help police locate the thief, but were asked not to guess. On the basis of these free descriptions, the experimenter constructed photospreads in a separate room from the eyewitnesses according to the lineup-distractor condition to which they had been randomly assigned. Each participant was then presented with a binder containing their six photos in a 2 × 3 array. After the experimenter left the room, each participant viewed the photospread and filled out a short response sheet.

Participants had the option of indicating on the response sheet that they thought the thief appeared in the photospread, that they thought the thief did not appear in the photospread, or that they did not know whether or not the thief appeared in the photospread. If they believed that the thief was present, participants were instructed to indicate which of the photos was the thief. All participants were asked to rate how confident they were in their judgments on a scale from 1 (*not at all confident*) to 7 (*completely confident*). When participants had completed their identification task, they were brought back to the waiting room, shown the actual thief, debriefed, and dismissed.

Results

Identification Decisions

We performed a series of chi-square analyses to test the main hypotheses. We had hypothesized that (a) false-identification rates would be high in the mismatch-description condition and low in both the resemble-suspect and match-description conditions, (b) accurate-identification rates would be high in both the mismatch-description and match-description conditions and low in the resemble-suspect condition, and (c) the resemble-suspect condition would either produce confusion (i.e., increase the rate of "don't know" responses) or produce a high rate of distractor identifications relative to the other two conditions.

Accurate identifications. As shown in Figure 2, the mismatch-description and match-description conditions produced higher rates of accurate identification than did the resemble-suspect condition. Chi-square analyses revealed no differences between the match-description and mismatch-description conditions, $\chi^2(1, N = 84) = .06$, *ns*, whereas the resemble-suspect condition differed significantly from both the match-description condition, $\chi^2(1, N = 84) = 15.65$, $p < .001$, and the mismatch-description condition, $\chi^2(1, N = 84) = 19.15$, $p < .001$.

False identifications. Figure 2 shows that false identifications were more likely when eyewitnesses viewed a mismatch-description lineup than when they viewed a resemble-suspect lineup or a match-description lineup. Chi-square analyses revealed that the resemble-suspect and match-description conditions did not differ, $\chi^2(1, N = 84) = 0.11$, *ns*, whereas each differed significantly in false-identification rates from the mismatch-description condition, $\chi^2(1, N = 84) = 8.62$, $p < .01$, for both contrasts.

The accurate- and false-identification pattern as a function of lineup-distractor conditions was highly consistent across the seven confederate culprits. The sample size for any single confederate culprit was too small to conduct individual analyses, but the pattern in Figure 2 held for each of the confederate culprits. In each case, the likelihood of an accurate identification was greater in the mismatch-description and match-description conditions than in the resemble-suspect condition. In addition, the likelihood of a false identification was greater in the mismatch-description condition than in the other two conditions for each of the seven confederate culprits.

In addition to correct identifications and false identifications, there were three other categorical responses that witnesses could make, namely, the identification of a distractor, a "not there" response, and a "don't know" response. Figure 3 shows the percentage of witnesses who made each response as a function of lineup-distractor condition. The following sections describe the data for each of these remaining categories.

Distractor identifications. Although we hypothesized that the resemble-suspect strategy would confuse eyewitnesses, it was not clear whether such confusion would surface as an increase in the rate of distractor identifications or as an increase in the rate of don't-know responses (Luus & Wells, 1991). When collapsed over culprit-present and culprit-absent conditions, the results indicated that distractor-identification rates were highly inflated by the resemble-suspect strategy in comparison with either the mismatch-description strategy, $\chi^2(1, N = 168) = 25.18$, $p < .001$, or the match-description strategy, $\chi^2(1, N = 168) = 12.04$, $p < .001$. The match-description strategy and mismatch-description strategy did not differ in distractor identifications, $\chi^2(1, N = 168) = 3.11$, *ns*. We conducted analyses of distractor identifications separately for culprit-present and culprit-absent conditions. When the culprit was present, the resemble-suspect strategy produced significantly more distractor identifications than did either the mismatch-description strategy, $\chi^2(1, N = 84) = 12.44$, $p < .001$, or the match-description strategy, $\chi^2(1, N = 84) = 12.44$, $p < .001$. The mismatch-description strategy and match-description strategy did not significantly differ in distractor identifications when the culprit was present, $\chi^2(1, N = 84) = 0.18$, *ns*. When the culprit was absent, distractor identifications were not significantly different between the resemble-suspect and match-description strategies, $\chi^2(1, N = 84) = 1.80$, *ns*, but the mismatch-description strategy produced more distractor identifications than did the resemble-suspect and the match-description strategies combined, $\chi^2(1, N = 126) = 9.97$, $p < .01$. As we expected, distractor identifications were more likely to occur when the culprit was absent (30.2%) than when the culprit was present in the lineup (19.0%), $\chi^2(1, N = 252) = 4.19$, $p < .05$.

Correct and incorrect not-there responses. There were no significant differences in the rate of correct not-there (i.e., correct rejection) responses as a function of lineup-distractor condition (for all contrasts, $\chi^2 < 1.00$). There also were no significant differences in the rate of incorrect not-there (i.e., incorrect rejection) responses as a function of lineup-distractor condition (for all contrasts, χ^2 values < 2.70, $ps > .10$). Somewhat surprisingly, there was no significant difference overall between correct-rejection rates and incorrect-rejection rates, $\chi^2(1, N = 252) = 3.23$, *ns*. In other words, witnesses were not significantly more likely to choose "not there" when the culprit was absent than they were when the culprit was present. A closer examination of Figure 3, however, reveals that the problem rests solely with the resemble-suspect conditions. In the resemble-suspect conditions, witnesses were somewhat more likely to choose the response "not there" when the culprit was present (incorrect re-

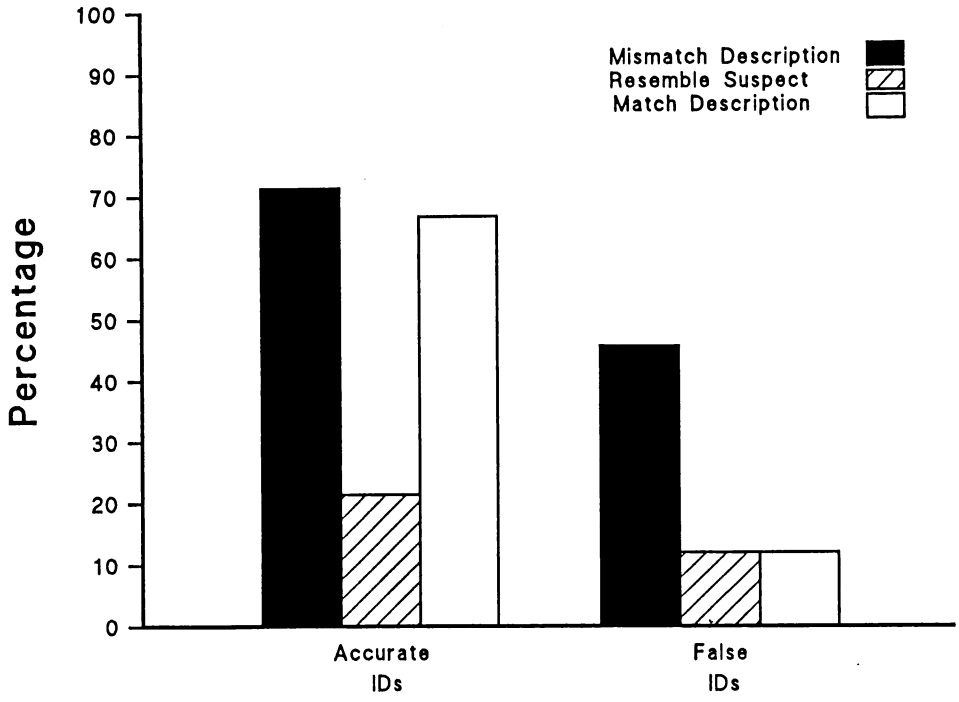

Figure 2. Percentages of accurate and false identifications (IDS) as a function of lineup-distractor condition.

jections) than when the culprit was absent (correct rejections), although the difference was not significant, $\chi^2(1, N = 84) = 0.57$, *ns*. In the mismatch-description and match-description conditions, on the other hand, witnesses were more than twice as likely to choose "not there" when the culprit was absent (correct rejections) than when the culprit was present (incorrect rejections), $\chi^2(1, N = 168) = 7.80, p < .01$.

Don't-know responses. None of the individual contrasts between the lineup-distractor conditions produced a significant difference in rates of don't-know responses. The largest difference was between the mismatch-description and match-description conditions, $\chi^2(1, N = 168) = 2.91$, *ns*. It is particularly noteworthy that the resemble-suspect condition did not result in a high rate of don't-know responses relative to the other conditions. Recall that it was unclear whether the resemble-suspect lineups would enhance don't-know responding or would increase the rate of distractor identifications. Although the resemble-suspect strategy did not enhance the rate of don't-know responses, it did increase the rate of distractor identifications, as reported earlier. Not surprisingly, the rate of don't-know responding was higher when the culprit was absent than when the culprit was present, $\chi^2(1, N = 252) = 5.35, p < .05$. This effect of culprit presence versus absence on the rate of don't-know responding was stable across lineup-distractor conditions.

Confidence

We speculated that the relation between confidence and accuracy might be stronger in the match-description condition than in the other two conditions. Results indicated, however, that the confidence–accuracy relation was not significant in any of the three conditions. Accurate identifications yielded mean confidence levels of 5.20, 4.56, and 4.89, whereas inaccurate identifications yielded mean confidence levels of 4.65, 4.09, and 4.29, for the mismatch-description, resemble-suspect, and match-description conditions, respectively. Data from witnesses who gave don't-know responses were excluded from the analyses of confidence. No test for differences in confidence between accurate and inaccurate identifications was significant (all *p*s > .10). Effect-size estimates were *r*s = .22, .11, and .22 for the mismatch-description, resemble-suspect, and match-description conditions, respectively.

We also compared the mean confidence levels of eyewitnesses who made correct rejections (not-there responses to the culprit-absent lineups) with the confidence levels of those who made incorrect rejections (not-there responses to the culprit-present lineups) and found no significant differences for any of the three conditions. Mean confidence levels for correct rejections were 5.31, 4.56, and 4.77, and mean confidence levels for incorrect rejections were 4.83, 5.08, and 4.00, for the mismatch-description, resemble-suspect, and match-description conditions, respectively.

When we collapsed the data over the present–absent factor and type of response, mean confidence levels were higher in the mismatch-description condition ($M = 4.46$) than in the resemble-suspect condition ($M = 3.80$) and in the match-description ($M = 3.68$) condition, $F(2, 249) = 3.38, p < .05$.

Analysis of Descriptions

The descriptions provided by the eyewitnesses were critical to the methods that defined the experimental conditions of the current study. Therefore, we calculated the mean number of descriptors in various categories to see whether they seemed

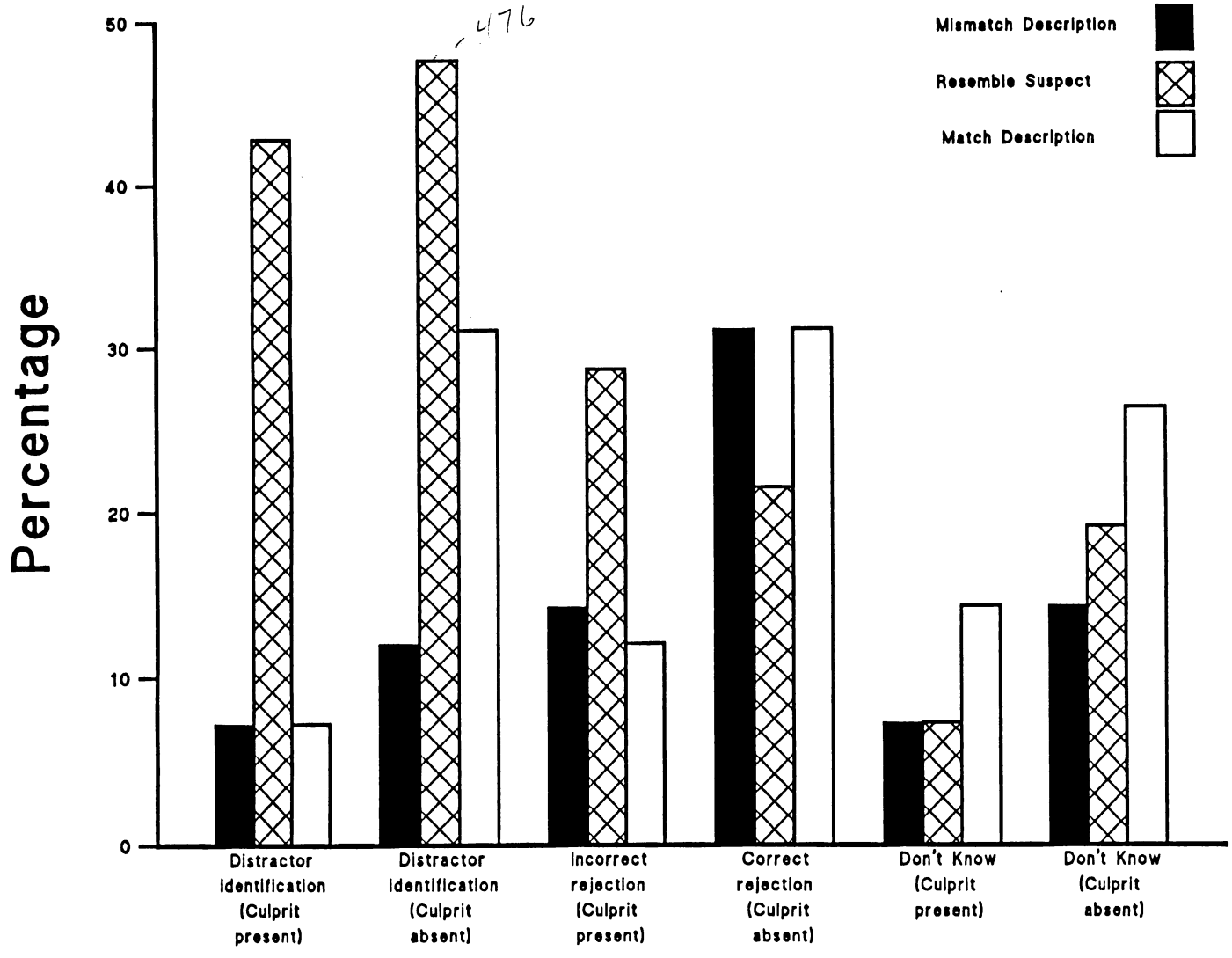

Figure 3. Percentages of distractor identifications, correct rejections, false rejections, and don't-know responses as a function of lineup-distractor condition.

reasonably comparable to what would be expected in actual crime cases. This comparative task was aided greatly by the recent work of Sporer (in press), who analyzed 172 free-recall descriptions of perpetrators by 100 eyewitnesses from real criminal cases. Sporer found, for example, that the mean number of descriptors of weight was 0.62, which is quite close to the mean of 0.56 obtained in the current experiment. The following are the mean numbers of descriptors that were obtained by Sporer and those that were obtained in the current experiment, respectively: age = 0.59 and 0.82, race = 0.23 and 0.64, weight = 0.62 and 0.56, height = 0.59 and 0.79, hair = 1.56 and 1.86, skin = 0.19 and 0.12, and face = 0.79 and 0.35. The total number of these descriptors was 4.70 for Sporer's analysis of eyewitnesses to actual crimes and 5.14 for eyewitnesses in the current experiment. With only two exceptions (race and face), our eyewitnesses' descriptions were quite close in both distribution and total number to those obtained from eyewitnesses to actual crimes.

The discrepancy between our eyewitnesses and those of Sporer (in press) on the face descriptor might be easily explained by noting that "beard" had a mean of 0.51 in Sporer's study and a mean of 0.00 in the current study (because none of our confederate culprits had facial hair). Subtracting the beard entry from Sporer's face category yields a mean of 0.28, which is quite close to our obtained mean of 0.35. The other discrepancy was on the race descriptor. We speculate that race was mentioned more frequently by our eyewitnesses than it was by the actual-case eyewitnesses because of the relatively high proportion of racial-minority confederate culprits in our experiment. Three of our seven confederate culprits were racial minorities, and race was mentioned by nearly every eyewitness when the culprit was of a racial minority. Hence, the descriptions given by our eyewitnesses seem quite comparable in total number of features and in feature distribution to those obtained from eyewitnesses in real criminal cases.

Analyses of Obtained Configurations

Although the data indicate that our manipulations of distractors were successful in producing the predicted outcome, how

can we be certain that the lineup-member-selection strategies produced the desired configuration and not some other configuration? Because those who constructed the lineup could not be kept blind to the identity of the thief, it could be argued that the constructors might have inadvertently biased their selections of the culprit replacements (i.e., those who served as innocent suspects). In particular, if the culprit replacements were more dissimilar to their respective confederate culprits in the match-description condition than in the resemble-suspect condition, then this might serve as an alternative explanation for how the match-description condition managed to hold down false identifications. We think that this is unlikely, because the rate of identifying the culprit replacements was equivalent (12%) in the two conditions. Nevertheless, we obtained similarity judgments from a sample of six judges who were blind to conditions and hypotheses. We randomly mixed the photos of all culprit replacements used in the resemble-suspect and match-description conditions. This was done for each of the seven confederate culprits. Each confederate culprit was then used as the standard for his or her respective set of culprit replacements, and the judges rank ordered each photo with respect to relative similarity to the confederate culprit. The rank order data indicated no tendency for the culprit replacements to be judged less similar to their confederate culprit in the match-description condition than in the resemble-suspect condition. In fact, the trend was in the opposite direction: 62% of the rankings indicated greater similarity between culprit replacements and their respective confederate culprit in the match-description condition than in the resemble-suspect condition. Hence, the selection of culprit replacements was, if anything, biased toward higher false-identification rates in the match-description condition than in the resemble-suspect condition.

It could also be argued that lineup constructors inadvertently biased their selections of distractors in a manner not in keeping with the distractor-selection protocol. In particular, it might be argued that lineup constructors were influenced by their knowledge of whether they were selecting distractors for a culprit-present lineup or a culprit-absent lineup. If the distractor-selection protocol was executed properly, then the similarity between distractors and suspects should not vary as a function of whether the suspect was the actual culprit or was an innocent replacement. On the other hand, if distractor–suspect similarity varied as a function of whether the suspect was the actual culprit, then a problem emerges because, unlike our lineup constructors, police cannot know whether the suspect is the actual culprit. To test for this possible bias, we had a sample of 12 judges, unaware of conditions and hypotheses, make similarity judgments between distractors and suspects for the culprit-present and culprit-absent lineups for both the resemble-suspect and match-description conditions. Results revealed that the average similarity between the distractors and their respective suspects did not differ as a function of whether the suspect was or was not the actual culprit for either the resemble-suspect or match-description conditions; $t(42) = 0.15$, *ns*, and $t(42) = 1.87$, *ns*, respectively. Although the mean similarity rating in the match-description condition was lower for culprit-present lineups ($M = 2.70$ on a 7-point scale) than for culprit-absent lineups ($M = 3.00$), the difference was not statistically significant. Hence, we concluded that the obtained configurations of similarity between suspects and distractors were consistent with the lineup-strategy protocols and were not biased toward other possible configurations.

Finally, we estimated the functional sizes of the obtained lineups. Rather than using mock witnesses (see Wells et al., 1979), however, we based these estimates on the percentages of actual eyewitnesses who selected the suspect in the culprit-absent conditions. Among the 36 eyewitnesses who made a decision (i.e., not counting those who indicated "don't know") in the mismatch-description condition, 18 selected the suspect, yielding a functional size of 2.00 (i.e., 36/18). We used the same logic for the resemble-suspect condition, in which 5 of 34 eyewitnesses selected the suspect, yielding a functional size of 6.80. For the match-description condition, we estimated functional size to be 6.20 (i.e., 31/5). These functional sizes are consistent with what we had hoped to achieve, namely, a low functional size for the mismatch-description lineups and functional sizes approximating nominal size (i.e., approximately 6.00) in the resemble-suspect and match-description conditions.

Discussion

These data support our contention that the match-description strategy is as effective as the resemble-suspect strategy at holding down false-identification rates. In addition, our results show that the match-description strategy is much better than the resemble-suspect strategy at promoting high rates of accurate identification. These results bolster the argument that selecting distractors who resemble a suspect can be detrimental to maintaining high accurate-identification rates. The consistency of this finding across seven different culprits, along with the robustness of the obtained differences across strategies, attests to the important role played by a proper selection of distractors in lineups and photospreads.

One way to think about the power of these distractor-selection strategies is to consider, on the basis of the probabilities obtained in the current study, what would happen across a set of 1,000 cases when each of the three strategies was used. If one assumes that there were 500 cases in which the police had arrested the actual culprit and 500 in which they had arrested an innocent person (i.e., 500 culprit-present and 500 culprit-absent lineups), then the mismatch-description strategy would produce 357 accurate and 214 false identifications, the resemble-suspect strategy would produce 107 accurate and 60 false identifications, and the match-description strategy would produce 333 accurate and 60 false identifications. Using different assumptions about the base rate for culprit-present and culprit-absent lineups tends to exaggerate or diminish the advantages of the match-description strategy in comparison with the other two strategies, depending on the direction of the base-rate change. In general, as the base rate for culprit-present lineups increases, differences between the match-description and mismatch-description strategies diminish, whereas differences between the match-description and resemble-suspect strategies become larger. Conversely, as the base rate for culprit-present lineups decreases, differences between the match-description and mismatch-description strategies become larger, whereas differences between the match-description and resemble-suspect strategies diminish. At no point, however, does the resemble-suspect strategy actually prove superior to the match-de-

scription strategy, even if the base rate for culprit-present lineups were set at zero.

In spite of the clarity of our results, we see potential practical problems. First, what happens if the eyewitness provides a description that does not match the suspect's physical characteristics? Second, what happens if the eyewitness's description is so peculiarly unique that no reasonable set of distractors can be found to match the description? Third, if one ignores the suspect's features and selects distractors who match the eyewitness's description of the culprit, is it possible that the suspect could have certain unique features that, although not recalled by the eyewitness, make the suspect stand out as a distinctive member of the lineup? We address each of these concerns in turn.

Suspect's Match to Description

In our experiment, the innocent suspect in the culprit-absent conditions always matched the eyewitness's description. In each condition, the strategy for selecting an innocent suspect involved selecting from a set of possible suspects, all of whom were consistent with the eyewitness's verbal description of the culprit. In actual cases, however, it sometimes happens that the suspect does not match the eyewitness's description on one or more features. This can happen when the person is a suspect for reasons other than his or her resemblance to the eyewitness's description (e.g., found in possession of stolen goods or traced through a license-tag number). We have no way of estimating how often this happens in actual cases. However, we do not see this problem as one that requires an abandonment of the match-description strategy in general, but, rather, one that requires a modification of the strategy. The solution that we propose when the suspect does not match the description is borrowed directly from Luus and Wells's (1991) analysis of this issue. The solution involves a combination of the match-description and resemble-suspect strategies. Specifically, one should select distractors who resemble the suspect only on the features that are discrepant between the description and the suspect; the remaining (nondescribed) features, however, should be allowed to vary across lineup members. Suppose, for example, that the eyewitness described the culprit as having curly brown hair, a moustache, and high cheekbones. Suppose that the suspect had straight brown hair, a mustache, and normal cheekbones. In this case, distractors should have straight brown hair, a mustache, and normal cheekbones. However, the distractors do not have to resemble the suspect on other, nondescribed features, such as chin shape, ear protrusion, skin tone, lip size, eye color, and so on. In other words, the suspect's appearance need only be used for selecting distractors on the subset of features that are discrepant between the description and the suspect's appearance.

Specificity of Description

Another potential concern with the match-description strategy arises when one considers a case in which an eyewitness provides such an unusually specific and individuating description that no one (other than, perhaps, the suspect) can be found to serve as a proper distractor. Suppose, for example, an eyewitness describes the culprit as a 6 ft 4 in. White male with red, curly hair, a handlebar mustache, a 2-in. half-moon scar on his left cheek, a gold eyetooth in the upper-left part of his mouth, and a tattoo of Dan Quayle on his right earlobe. There are three points to be made about this apparent problem. First, the problem is not unique to the match-description strategy; one would have the same problem with the resemble-suspect strategy. Second, if a description is so specific and individuating as to preclude finding suitable distractors, the entire logic for conducting a lineup must be called into question (Luus & Wells, 1991). The purpose of a lineup is to reduce uncertainty beyond the level of what was known before conducting the lineup: If a prelineup description is so diagnostic as to be idiosyncratically associated with the suspect, why conduct a lineup at all? It seems fairly clear that, in a case like the one above (with the scar, tooth, and tattoo information), the presence of these features in the arrested suspect is sufficient to establish identity and that any formal identification process is probably unnecessary. Alternatively, one could hide the features that are problematic for matching (e.g., by placing a bandage over the scar area and over the earlobe and by instructing members of the lineup to keep their mouths closed) and could seek an identification based on features other than the ones used in the eyewitness's description. Finally, we note that none of our subject eyewitnesses were able to give such highly diagnostic descriptions that we were unable to match the features they mentioned.

We were able to satisfy the matching criterion for each of the 252 eyewitness descriptions even though we had only about 30 photos per confederate culprit from which to choose. It should be noted, however, that these photo sets for each of the seven confederate culprits were carefully selected before the experiment on criteria of matching likely descriptions and global resemblance to the particular confederate culprits used in the experiment. Accordingly, we do not know how many photos would be required to cover the possible descriptions that could be obtained in an actual case when there is not a preselected corpus of similar people.

Inadvertent Distinctiveness

The third potential concern with the match-description strategy is that the suspect might have some unique feature that the eyewitness did not include in his or her description. Because the match-description strategy ignores nondescribed features, this unique feature might make the suspect stand out as a distinctive member of the lineup and might bias the eyewitness to identify that person. Although we agree that this type of inadvertent distinctiveness could theoretically occur, we feel that there might be a natural tendency for this to not happen when the suspect is the actual culprit, owing to the fact that distinctive facial features are likely to be the ones remembered (e.g., see Winograd, 1981). Hence, if a facial feature is distinctive enough to be problematic for a lineup, it seems unlikely that this feature would be left out of the eyewitness's prelineup description. Suppose, however, that the suspect is innocent and has a distinctive feature, such as protruding ears. The suspect's innocence would explain why the eyewitness's description did not mention protruding ears. One could argue that it would be desirable, therefore, to control for the distinctive feature in constructing a lineup by using distractors who also have protruding ears or by obscuring the ears of each lineup member. But this argument

neglects the possibility that it is precisely the distinctiveness of the feature in question that allows the eyewitness to exonerate the suspect (e.g., "I know it is not Number 3 because the guy who robbed me didn't have goofy ears like that"). Hence, those who would advocate that feature distinctiveness is inherently undesirable in lineups may be failing to acknowledge that lineups can serve to exonerate suspects. Recognition memory includes not only the act of recognizing that a test stimulus is the same as one encountered previously but also the act of recognizing that a test stimulus is not the same as one encountered previously.

As a final comment about inadvertent distinctiveness, we note Luus and Wells's (1991) argument about this problem. They asserted that the question of whether or not the suspect's distinctive feature will bias the lineup against the suspect depends on the entire set of lineup members, each of whom may be distinct in unique ways:

> Each distractor undoubtedly will have some unique features that, if isolated for analysis, make the distractor stand out. For example, the suspect might be the only one with protruding ears, but distractor number 2 is the only one with bushy brows, distractor number 3 is the only one with wavy hair, distractor number 4 is the only one with a dimpled chin, distractor number 5 is the only one with brows that have a different color than the hair on his head, and so on. The eyewitnesses should no more be influenced by the suspect's protruding ears than by the bushy brows, wavy hair, or dimpled chin of the alternative distractors. (p. 54)

Conclusion

A good lineup appears to be one in which all lineup members match the eyewitness's prelineup description of the culprit but otherwise do not resemble each other. When the distractors do not match the eyewitness's description, relatively high rates of identification of the suspect can result, regardless of whether or not the suspect is the actual culprit. When distractors are selected to resemble the suspect, however, low rates of suspect identification can occur, regardless of whether or not the suspect is the culprit. Hence, the cost of selecting distractors who do not match the prelineup description is a high false-identification rate, whereas the cost of selecting distractors who resemble the suspect is a low accurate-identification rate. The strategy of selecting distractors who match the eyewitness's prelineup description of the culprit (but vary from each other on nondescribed features) has the same ability to protect innocent suspects as the resemble-suspect strategy and the same ability to secure accurate identifications as the mismatch-description strategy.

We found no evidence that the resemble-suspect strategy for selecting distractors accorded greater protection for an innocent suspect than did the match-description strategy. This was consistently true across all seven of our confederate culprits. This finding, along with the finding that the resemble-suspect strategy produced a much lower accurate-identification rate than did the match-description strategy, lends increased credibility to the argument that it is possible to use distractor-selection strategies that provide protection for the innocent suspect without protecting the guilty suspect.

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