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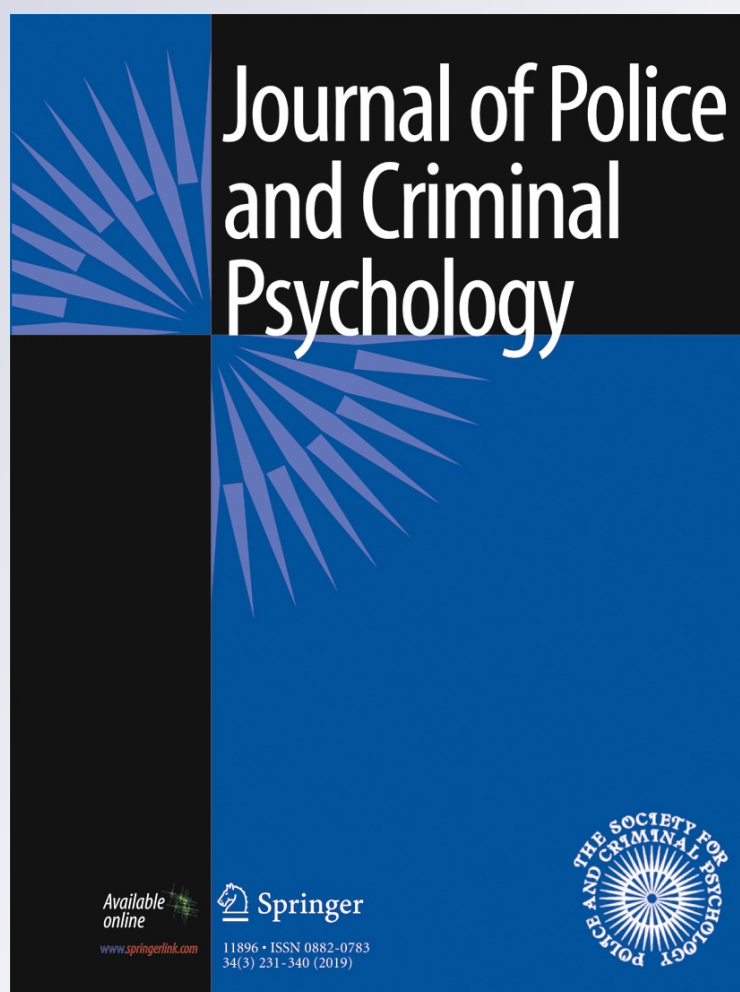
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Evidence for the Belief in Live Lineup Superiority

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Abstract

There are substantive differences in international preferences in the medium through which eyewitness identification lineups are administered, but these jurisdictional preferences are not based on evidence. Regardless of whether one medium produces greater identification accuracy, it is the perception of evidence strength by triers of fact that determines its influence in judicial proceedings. Yet, we know little about how lineup mediums are perceived by potential triers of fact. Four-hundred six undergraduate students viewed a video interview of an eyewitness describing an identification that took place with one of three different lineup mediums (live, video, photo) to compare their relative persuasiveness. Participants also directly compared mediums. There was a clear preference for evidence elicited from live lineups in direct comparisons, but not in the experimental conditions. Live lineup superiority beliefs exist in policy and, these data show, in the beliefs of potential witnesses and triers of fact when various lineup mediums are directly compared.

Keywords Lineup medium · Eyewitness identification · Live superiority hypothesis

Evidence for the Belief in Live Lineup Superiority

There is substantial international variation in the medium through which eyewitness lineup identifications are presented. Due to the practical challenges posed by the construction, organization, and administration of live lineups (Valentine and Heaton 1999), many jurisdictions have adopted nonlive alternatives. Photo lineups are easy to construct, portable, and simple to administer. Video lineups share many of the advantages of photo lineups and also provide dynamic views of the lineup members. These practical advantages, however, are up against the intuitive appeal of live lineups, which pass the “eyeball” test of appearing on the surface to provide the most information to a potential witness. Nevertheless, experimental research has yet to demonstrate that live lineups are any better than nonlive alternatives (Brewer and Palmer 2010; Clark et al. 2015; Cutler et al. 1994; Fitzgerald et al. 2018).

Despite the absence of empirical evidence, witnesses and triers of fact may intuit that live lineups would produce the most accurate identification evidence. Fitzgerald et al. (2018) reviewed eyewitness identification practices in five countries (Australia, Canada, England and Wales, South Africa, and the USA) and found they all either once had or still have policies consistent with a *live superiority hypothesis*. Whether a potential juror or judge similarly believes in live superiority is a critical question because, even if a host of practical challenges accompany live lineups, it is the perception of the strength of the evidence that will determine its persuasiveness and influence in judicial proceedings. In the present study, we examined perceptions of evidence elicited with one of three different lineup mediums (live, video, photo) in an attempt to better understand how potential triers of fact perceive such evidence. We studied this question from two perspectives: (1) we examined perceptions of lineup mediums in a between-subjects vignette study to explore potential influences within the context of a witness’ testimony, and (2) we directly asked participants to compare lineup mediums and indicate their preference.

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Identification Outcomes by Lineup Medium in the Field and in the Lab

Although live lineups were once the preferred medium in England and Wales, Home Office guidance now indicates a

preference for video lineups. In addition to the practical and economic benefits of presenting reusable video recordings of the lineup members, the policy change was precipitated by empirical research involving lineups conducted in the field. The first relevant data were reported by Valentine and Heaton (1999), who showed that video lineups were fairer to suspects compared with live lineups (see also Valentine et al. 2003). The second set of field data were archival records of identifications from live and video lineups, collected by the Video Identification Parade Electronic Recording (VIPER) unit of the West Yorkshire Police force (Pike et al. 2002). In the archival data, the suspect identification rate for video lineups was significantly higher than the rate for live lineups. There are several caveats to these field data: the difference in suspect identifications was small (39% vs. 35%, respectively); the ground truth of the suspect's guilt was unknown; and the allocation of witnesses to a lineup medium was not random because, at that time, video lineups were only permitted when live lineups were not practical. Nevertheless, given the relative ease of organizing and administering video lineups, and the absence of any indication that video lineups reduce suspect identifications, Pike et al. (2002) recommended abandoning the preference for live lineups and giving video lineups equivalent status. Police forces in England and Wales started to transition away from live lineups in 2003, and they now use video presentation in virtually every lineup case (Valentine et al. 2009).

Consistent with the archival field research, live lineups have not outperformed photo or video lineups in laboratory experiments. In their review of 11 experimental comparisons between live and nonlive lineups, all of which were laboratory experiments, Fitzgerald et al. (2018) found that none provided strong support for the live superiority hypothesis and one set of experiments was actually suggestive of live *inferiority* compared to photos (Dent and Stephenson 1979). Fitzgerald et al. also reported that participants seemed more reluctant to choose from live relative to nonlive lineups (i.e., more conservative responding; Cutler and Fisher 1990; Dent and Stephenson 1979; Kerstholt et al. 2004; Peters 1991).

Theoretical and Applied Consequences of a Live Superiority Hypothesis

A widespread belief in live superiority could explain the conservative responding associated with live lineups. If witnesses believe that they would be best able to identify someone at a live lineup, they may expect that the culprit, if present, would elicit a stronger experience of recognition than would be expected at a nonlive lineup. This difference in expectations could lead participants to increase their threshold for identifying a lineup member from a live lineup relative to a threshold they would have applied for a

photo or video lineup. To explore this explanation of the conservative response bias in live lineups, it must first be established that participants in lineup experiments (typically undergraduate students) believe that live lineups are superior to nonlive lineups.

Empirical evidence of the live superiority hypothesis would also have policy implications. Australia and South Africa have policies that indicate a preference for live lineups (Australian Law Reform Commission 2006; Rust and Tredoux 1998; *S v. Moti* 1998). Even in England and Wales, where video lineups are now standard practice, live lineups are preferred over photo lineups in policy (Home Office 2017). But technological advances have led to significant increases in the quality of the photo and video images since the origin of these policies, and the preference for live lineups may reflect more of a continuation of tradition than a contemporary belief that photo and video lineups are inferior. Although a belief in the superiority of live lineups is evident in eyewitness identification policies throughout the world, empirical data are needed to assess whether the live superiority hypothesis is pervasive in the digital age.

The Present Study

In the present research, participants watched a video interview of an eyewitness describing an identification from a live, photo, or video lineup. After providing a judgment of guilt for the case, participants were queried about which of the three lineup mediums would be most likely to produce a correct identification decision. We hypothesized that we would observe evidence for a live superiority belief, which would be supported both by higher guilt ratings when the witness described an identification from a live lineup (vs. nonlive lineups) and by a preference for live lineups in the medium comparison queries.

We also manipulated viewing conditions (lighting: well-lit, dark) and the certainty of the eyewitness (70%, 90% confident) to assess participants' sensitivity within each medium to the strength of identification evidence. Consistent with prior research, we anticipated that witnesses would place greater value on identifications made with higher confidence (e.g., Brewer and Burke 2002). With little direct guidance related to lighting conditions during encoding (but see Yarmey 1986), we nonetheless hypothesized that witnessing the suspect in good lighting would be perceived as "good viewing conditions" and thus, a resulting identification would be evaluated more favorably than witnessing the suspect in poor lighting. We also anticipated that lineup medium may interact with evidence strength (confidence, lighting) such that a witness would be more likely to forgive low confidence or poor lighting if the identification was obtained with a preferred

lineup medium. That is, we anticipated that participants would treat lineup medium as contributing to evidence strength, which would be balanced with other evidence strength factors (lighting and confidence).

Method

Participants

Undergraduate students ($N=406$; M age = 20.61 years; 65% female) at two universities in Canada participated individually or in small groups of up to 10 for course credit. Participants were quasi-randomly assigned to conditions, with the restriction of equal distribution across conditions. This study was a 3 (lineup medium: photo, live, video) \times 2 (witness confidence: 70%, 90%) \times 2 (viewing conditions: light, dark) between-subjects design.

Materials and Procedure

Eyewitness Testimony Videos Participants watched a video (approximately 70 s in duration) featuring two actors. A 28-year-old male “witness” answered questions posed by a “prosecutor” about a witnessed assault and robbery. The witness described the crime and then answered questions about his lineup identification of the accused. In addition to a standard crime description, the witness discussed the medium in which the lineup was presented (photo, live, or video), how confident he was in his identification (70% or 90%), and the viewing conditions at the scene of the crime (well-lit or dark). Thus, 12 different versions of the video were presented.

To manipulate the lineup medium, the witness briefly described each medium in the following manner:

- (1) Photo: “...showed me a bunch of pictures of guys to look at one at a time, you know like, head and shoulders shots...”
- (2) Video: “...showed me a bunch of videos of guys to look at one at a time, you know, like videos of just their heads and shoulders, but they turn so I can see their faces...”
- (3) Live: “...showed me a bunch of guys one at a time behind a one-way mirror so I could look at them without them seeing me...”

To manipulate viewing conditions, the witness described the lighting in one of two ways:

- (1) “...there was a streetlight he ran under, so I got a pretty good look at him.”
- (2) “...it was pretty dark, so I didn’t really see him all that well.”

Finally, the witness described his confidence as either:

- (1) “...I told the cops that I was pretty sure it was him. Like, 70% sure.”
- (2) “...I told the cops that I was pretty sure it was him. Like, 90% sure.”

We focused our investigation on sequential lineups because the sequential presentation is used for all three mediums in practice, whereas simultaneous presentation is only used for photo and live mediums.

Video Evaluations After viewing the video, participants rated the likelihood that the accused committed the crime from 0% (extremely unlikely) to 100% (extremely likely) and made a categorical verdict decision (guilty/not guilty). Participants were then asked to provide narrative descriptions of any concerns they had with the witness’ identification (“Do you have any concerns about the witness’ identification?”) and factors that may have increased their confidence in the accuracy of the identification (“What might have made you more sure about the accuracy of the witness’ identification?”). Three questions were then posed to assess participants’ attention to the manipulations in the video: Did the witness get a good look at the suspect? How confident was the witness? What did the police give the witness to make the identification (live, photo, video)?

General Lineup Impressions Following questions about the experimental manipulations, participants responded to questions querying their opinions regarding the reliability of a variety of lineup mediums in general. They were asked to indicate which lineup medium (simultaneous or sequential: live, photo, or video) they believed would be the best procedure to accurately identify a perpetrator, should they *personally* have witnessed a crime. They were then asked to explain their choice. Next, they were asked to rate from 0 (not at all confident) to 100 (extremely confident) how confident they would feel making an identification with each of the six lineup mediums listed above. Finally, participants indicated which of the six mediums would be the best procedure to ensure that *someone else* could accurately identify a perpetrator.

Procedure Participants arrived at the lab and were informed that they would watch a short video and answer some questions. After viewing one of the 12 videos, participants provided demographic information and then were asked to take on the role of a juror while completing the questionnaires (approximately 10 min). Participants were then debriefed and thanked.

Coding

Open-ended responses were reviewed by two coders and the first author to generate categories of responses. Next, the two coders independently coded the complete sample to obtain intercoder agreement. Agreement for each question ranged from 83 to 86%.

Results

Three attention-check questions were posed during the experiment. Participants who failed to correctly respond to all three questions ($N = 10$) were excluded from analyses. Thus, the total sample collected of 416 was reduced to 406 for analyses.

Suspect Guilt Participants' ratings of the likelihood of suspect guilt (from 0% (extremely unlikely) to 100% (extremely likely)) were entered into a 3 (lineup medium) \times 2 (witness confidence) \times 2 (viewing conditions) analysis of variance (ANOVA). There was a main effect of viewing conditions, $F(1, 394) = 19.78, p < 0.01, \eta_p^2 = 0.05$, with participants more likely to rate the suspect as guilty when encoding conditions were described as well-lit than when they were described as dark. There was also a main effect of lineup medium, $F(2, 394) = 3.08, p = 0.047, \eta_p^2 = 0.02$. Post hoc tests indicated that participants were more likely to rate the suspect as guilty when the witness had made an identification from a video lineup than from a photo lineup, $p = 0.01, d = 0.31$ [95% CI 0.07, 0.55]. No other comparisons differed significantly, $ps > 0.14$. Descriptive data are presented in Table 1.

Participants made a dichotomous decision about suspect guilt (guilty/not guilty). A 2 (guilt) \times 3 (medium) \times 2 (viewing conditions) \times 2 (certainty) hierarchical loglinear analysis revealed no interactions, $ps > 0.47$.

Participants then rated their confidence in their dichotomous guilt decision (from 0 to 100). We conducted two ANOVAs, one for participants who rated the suspect as guilty and one for those who rated the suspect as not guilty. There were no significant differences ($F_s < 1.6, ps > 0.24$).

Finally, participants were asked two open-ended questions about concerns related to the witness' identification and what may have enhanced confidence in the witness' identification.

Table 1 Means (standard deviations) of participant guilt ratings (0 to 100)

View	70% Confidence		90% Confidence	
	Well-lit	Dark	Well-lit	Dark
Photo	57.03 (18.62)	47.41 (23.22)	61.47 (18.58)	55.00 (25.64)
Live	63.51 (16.62)	54.39 (19.36)	65.63 (20.11)	47.03 (24.40)
Video	61.06 (16.48)	55.06 (17.29)	65.56 (17.47)	62.97 (16.26)

The most frequent concerns described about the identification were general unreliability (42.6%), lighting (34.5%), witness confidence (29.1%), witness believability (20.4%), and lineup medium (7.1%). The most common suggestions for what may have increased confidence in the identification were comments related to more specific descriptions/more emotional witness (35.5%), more favorable witnessing conditions (31.5%), witness confidence (21.4%), lighting (16.3%), and lineup medium (7.6%).¹

Lineup Beliefs After responding to questions about the witness depicted in the video, participants provided general impressions of eyewitness identification lineup procedures. Participants were asked to indicate which of six lineup presentation methods (see Fig. 1) would be preferable for making their own identification, as well as which method would lead to the most accurate identifications by another person. Some participants were excluded from the following analyses for selecting multiple mediums as preferable, resulting in a sample of 374. For the question about their own identification, a 2 (simultaneous vs. sequential) \times 3 (live vs. photo vs. video) hierarchical loglinear analysis revealed a significant two-way effect, $\chi^2(2) = 31.11, p < 0.001$. Partial associations indicated a significant effect for medium, $\chi^2(2) = 381.49, p < 0.001$, and a significant effect for presentation, $\chi^2(1) = 3.87, p = 0.049$. Live lineups (82%) were preferred over both photo lineups (6%), $z = 32.42, p < 0.001, OR = 72.00$ [95% CI 43.47, 119.24], and video lineups (12%), $z = 26.49, p < 0.001, OR = 32.09$ [95% CI 21.39, 48.13], and simultaneous lineups (55%) were preferred over sequential lineups (45%), $OR = 1.50$ [95% CI 1.13, 2.01]. The interaction indicated that the preference for simultaneous lineups only applied to the live medium. For the video medium, sequential was preferred. As can be seen in Fig. 1, a very similar pattern of responses was observed for the question about which method would work best for someone else.

Participants then provided narrative explanations for their ratings. The most common reasons provided for preferring a particular lineup medium were greater accuracy (54.2%), live is more realistic (34.0%), additional behavioral information provided (20.2%), additional physical information provided (19.7%), and photos can be examined more closely (3.7%).

Finally, participants rated how confident they would be in making an identification from each lineup medium option, given good viewing conditions. A 2 (simultaneous vs. sequential) \times 3 (live vs. photo vs. video) repeated-measures ANOVA was performed and, due to Mauchly's test indicating that the assumption of sphericity was violated for tests involving the medium, $\chi^2(2) = 16.11, p < 0.001$, we applied the Greenhouse Geisser correction to the degrees of freedom for all tests

¹ Note. Percentages sum to more than 100% because participants could provide multiple responses.

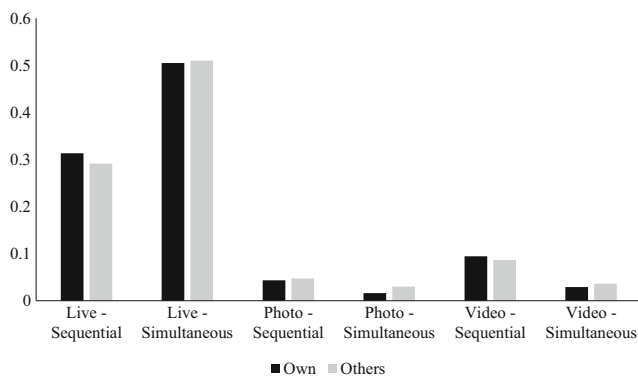


Fig. 1 Proportion of participants rating each lineup medium as best for identifying a perpetrator (own identification and identifications by others)

involving the medium. The ANOVA revealed a main effect of medium, $F(2, 774) = 172.93$, $p < 0.001$, $\eta_p^2 = .309$, no main effect of presentation $F(1, 387) = 0.88$, $p = 0.348$, $\eta_p^2 = 0.002$, and a significant interaction, $F(2, 774) = 20.14$, $p < 0.001$, $\eta_p^2 = 0.049$. The main effect was again indicative of a preference for live lineups ($M = 74.32$, $SD = 15.97$) over photo lineups ($M = 59.36$, $SD = 17.61$) and video lineups ($M = 61.54$, $SD = 18.56$). The interaction indicated higher ratings for simultaneous with live (simultaneous $M = 75.85$, $SD = 19.75$; sequential $M = 72.48$, $SD = 20.12$) and photo (simultaneous $M = 60.26$, $SD = 20.38$; sequential $M = 58.23$, $SD = 20.56$), vs. higher ratings for sequential with video (simultaneous $M = 60.19$, $SD = 21.63$; sequential $M = 62.87$, $SD = 20.99$).

Discussion

There is distinct international division in the perception of lineup medium best practices, as reflected in policy. Yet, there is little empirical evidence to guide policy development. Advancing our understanding of lineup identification accuracy as a function of lineup medium is a critical area for further inquiry, but it is also important to understand how potential triers of fact perceive evidence elicited by each medium. The clearest finding in the present study is that when participants were asked to directly compare lineup mediums, there was a strong preference for live lineups, thus supporting the existence of a live superiority hypothesis in potential witnesses and triers of fact.

Evidence for a Live Superiority Hypothesis

The strong preference for live lineups when all mediums were directly compared provides the first evidence for a live superiority hypothesis among potential witnesses and triers of fact. Live lineups are associated with lower choosing rates, which may result from a more strict decision criterion. If witnesses and triers of fact believe that making an accurate identification

is more likely from a live lineup relative to alternative options, they may have higher expectations for both themselves and others making such identifications. The demonstration that undergraduate students believe that live lineups are superior in the present research is an important step in developing a theoretical understanding of the medium's effect on eyewitness identification decisions. If the live superiority hypothesis is also prevalent among individuals in the justice system, this could also have applied implications. For instance, one can imagine an investigator may ask a witness to make an initial identification from a photo lineup, but subsequently assemble a live lineup to allow the witness to make an identification from a more desirable medium.

Why might live lineups be preferred over other mediums? As discussed above, there may be an intuitive belief that live lineups provide the most information and that more information is likely to lead to more accurate identifications. Indeed, in response to open-ended questions, participants reported believing that both live and video lineups were more realistic than photo lineups and that they provide behavioral and physical information beyond what is available in photo lineups. Implicit in these reports is a belief that this additional information would contribute to more accurate identifications—a supposition that may not always be true (see Fitzgerald et al. 2018 for review). There is some indication that additional physical cues might be able to enhance the ability to match images (Rice et al. 2013), but the link has not yet been made to eyewitness identification accuracy.

Evaluating Lineup Medium in Isolation

The preference for video over photo lineups was the only significant difference related to lineup medium that was observed in the experimental manipulations—and it was a small effect. There are several possibilities for why the lineup medium did not have a substantive effect in the experiment. First, our manipulation of lineup medium may not have been especially salient to witnesses, particularly when other components of the witness' testimony were more intuitively influential (e.g., lighting). When participants were asked to report concerns with the eyewitness identification depicted in the video, lineup medium was only rarely raised (7.1%), suggesting that it may not be a primary consideration for participants unless consciously directed to attend to the medium. Further, when we asked participants to report which lineup medium had been used to elicit the identification, only 80% of participants in both the live (80.7%) and photo (80.3%) identification conditions were able to respond correctly, and 48.5% of participants in the video condition were able to correctly report the lineup medium used. This much lower correct response rate for video lineups may relate to the lack of familiarity with video lineups.

We also considered the possibility that our focus exclusively on sequential lineups in the experimental conditions may have influenced the preference for video lineups. For example, if video lineups were strongly preferred when presented sequentially (compared to simultaneously), our focus on sequential lineups may explain why video lineups were preferred in the experimental conditions, whereas live lineups were preferred in the general preferences questions. However, simultaneous and sequential lineups were rated very similarly in the current research and, if anything, the belief in live lineup superiority was slightly stronger in sequential (vs. simultaneous) lineups.

Relations to Evidence Strength

Lineup medium did not interact with manipulations of evidence strength (witness confidence and viewing conditions). We had anticipated that weak evidence strength may be compensated for with what was perceived as a “strong” medium, but this was clearly not the case. Although mock jurors have previously been found to be relatively insensitive to viewing conditions (e.g., Cutler et al. 1988), we observed overall effects of lighting on guilt ratings. However, the lack of interaction with lineup medium suggests that the influence of lineup medium may be evaluated independently from evidence strength. It is also possible that our manipulations of evidence strength were simply not strong enough to interact with medium (i.e., weak evidence was not “weak enough”).

As this area of research moves forward, an important contextual consideration is ecological validity in the use of mock crimes, mock witnesses, and mock jurors. Though such methods allow for the isolation of particular variables of interest and have been shown to not differ substantially from research on “real” jury decision-making (see Bornstein 1999), laboratory materials are unlikely to capture the important nuances and influences that will be present in real cases involving eyewitness identification. Thus, an important next step will be to continue to explore live superiority beliefs in multiple contexts.

A final point of interest is that eyewitness testimony is among the most influential forms of evidence (Semmler et al. 2011) and the persuasiveness of inaccurate eyewitness identifications has contributed disproportionately to wrongful convictions in DNA exoneration cases (www.innocenceproject.org). Most of the research conducted on the persuasiveness of eyewitness evidence, however, has focused on photo lineup identifications. Thus, it is possible that estimates of the persuasiveness of eyewitness evidence that rely on prior research with photo lineups may underestimate the influence of eyewitness evidence gathered using a different medium.

Conclusion

Despite strong jurisdictional guidance regarding how eyewitness identification procedures should be administered, there is relatively little evidence to support one medium over another. The ultimate aim of eyewitness identification is to provide evidence that can be evaluated in judicial proceedings. Thus, the perception of the evidence is critical. If a particular lineup medium produces a higher rate of accurate identifications, we must also consider the potential cost to credibility if triers of fact cannot appropriately evaluate the evidence. Similarly, if evidence is weighted too heavily when obtained with one particular medium over another, awareness must be brought to the judiciary about inappropriate influence. The present data suggest that when lineup mediums are compared directly, the belief in the superiority of live lineups is strong among potential witnesses and triers of fact.

Compliance with Ethical Standards

Conflict of Interest The authors declare that they have no conflict of interest.

Ethical Approval All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Informed Consent Informed consent was obtained from all individual participants included in the study.

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