

Policy and Procedure Recommendations for the Collection and Preservation of Eyewitness Identification Evidence

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Objective: The Executive Committee of the American Psychology-Law Society (Division 41 of the American Psychological Association) appointed a subcommittee to update the influential 1998 scientific review paper on guidelines for eyewitness identification procedures. **Method:** This was a collaborative effort by six senior eyewitness researchers, who all participated in the writing process. Feedback from members of AP-LS and the legal communities was solicited over an 18-month period. **Results:** The results yielded nine recommendations for planning, designing, and conducting eyewitness identification procedures. Four of the recommendations were from the 1998 article and concerned the selection of lineup fillers, prelineup instructions to witnesses, the use of double-blind procedures, and collection of a confidence statement. The additional five recommendations concern the need for law enforcement to conduct a prelineup interview of the witness, the need for evidence-based suspicion before conducting an identification procedure, video-recording of the entire procedure, avoiding repeated identification attempts with the same witness and same suspect, and avoiding the use of showups when possible and improving how showups are conducted when they are necessary. **Conclusions:** The reliability and integrity of eyewitness identification evidence is highly dependent on the procedures used by law enforcement for collecting and preserving the eyewitness evidence. These nine recommendations can advance the reliability and integrity of the evidence.

Public Significance Statement

Mistaken eyewitness identification is a primary contributor to criminal convictions of the innocent. Pristine procedures for collecting and documenting eyewitness identification evidence can help prevent these mistakes. This scientific review paper makes nine system variable recommendations concerning eyewitness identification procedures that should be implemented by crime investigators in eyewitness identification cases.

Keywords: eyewitness identification, lineups, showups, identification procedures, eyewitness recommendations

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The identification of criminal suspects by eyewitnesses continues to be a staple form of evidence used by the justice system to help establish the identity of crime culprits. Over the last few decades, however, serious concerns have been raised about the potential unreliability of eyewitness identification evidence. There have been two primary forces that have helped to shape this concern about the reliability of eyewitness identifications. First, psychological scientists began developing programmatic laboratory-based experimental research starting in the mid to late 1970s that focused on eyewitness identification. Early in this research, it became apparent that certain variables under control of the criminal justice system can dramatically inflate the likelihood of a mistaken identification; these variables were called *system variables* (Wells, 1978). An instruction given to eyewitnesses prior to viewing a lineup, for example, is a system variable because it influences the reliability of the eyewitness's identification and is under the control of the legal system's policies and procedures for administering lineups (Malpass & Devine, 1981). By the mid-1990s, psychological scientists had published hundreds of laboratory-based experiments in peer-reviewed journals showing that mistaken identification rates can be very high under certain conditions and had identified some of the more problematic sets of conditions that can lead to such errors in real-world circumstances (e.g., Cutler & Penrod, 1995).

The second major force propelling a strong awareness of the potential fallibilities of eyewitness identification was the application of forensic DNA testing to claims of innocence. Although forensic DNA testing was conceived primarily as a tool to incriminate the guilty, the exonerating powers of forensic DNA testing quickly became evident. Starting in the 1990s, DNA was used to test claims of innocence in selected postconviction cases and a cascade of exonerations of innocent people began to unfold. In a report commissioned by the U.S. Department of Justice examining the first 30 exonerations, it was quite clear that the vast majority of these cases involved mistaken eyewitness identifications (Connors, Lundregan, Miller, & McEwan, 1996). Although legal scholars had described a number of cases of innocent people being convicted in the United States based on mistaken identification before the development of DNA testing (e.g., Borchard, 1932; Brandon & Davies, 1973; Frank & Frank, 1957; Huff, Rattner, & Sagarin, 1986), the DNA exoneration cases quickly outnumbered previously known cases of convictions of the innocent. Moreover, the pre-DNA cases tended to be less definitive about whether the person was, in fact, innocent, often just indicating "probable innocence" or "legal innocence" rather than the more definitive "actual innocence" characterization that accompanied DNA-based exonerations (Garrett, 2011; Scheck, Neufeld, & Dwyer, 2000; West & Meterko, 2017).

The development of a scientific literature on eyewitness identification and the use of forensic DNA testing to uncover mistaken eyewitness identifications were a powerful combination. In 1996, the Executive Committee of the American Psychology-Law Society (AP-LS, Division 41 of the American Psychological Association), the primary scholarly organization for eyewitness identification researchers, appointed a committee to draft a scientific review paper on recommendations for how to collect eyewitness identification evidence. The result of that review, vetted by the membership of AP-LS and subjected to peer review, was published in *Law and Human Behavior* (Wells et al., 1998). That article,

commonly referred to as the "white article on lineups," is the forerunner to the current article. In effect, the current article is an update of the original scientific review paper on lineups and, like the original scientific review paper, also represents the official position of the AP-LS on these issues. The 1998 scientific review paper was the first set of science-based recommendations regarding how to conduct lineups that was endorsed by a scientific society. In addition, the 1998 scientific review paper played an important role in subsequent developments. For example, it was the model on which the U.S. Department of Justice made its recommendations in its 1999 guide for law enforcement on collecting and preserving eyewitness evidence. The NIJ Guide was mailed to all of the more than 17,000 law enforcement agencies in the U.S. (Technical Working Group for Eyewitness Evidence, 1999). Moreover, the 1998 article was a model on which the New Jersey Department of Justice created the first statewide guidelines on eyewitness identification that law enforcement were required to follow. It was also the first peer-reviewed publication to include a description of the unfolding DNA exoneration cases (40 at that time) and what these DNA cases might tell us about eyewitness identification evidence. The 1998 scientific review paper has been used as supporting written material in countless seminars and workshops of lawyers, police, prosecutors, and judges, as well as in police training. Finally, the 1998 scientific review paper has been relied on by state and federal courts across the U.S. (e.g., *New Jersey v. Henderson*, 2011; *State v. Lawson*, 2012; *Young v. Conway*, 2013).

The Need for an Updated Scientific Review Paper on Lineups

Today, our understanding of eyewitness identification has matured well beyond where it was when the previous scientific review paper was published. Clearly, experimental laboratory studies have grown immensely in number and breadth over the last 20 years. However, the general methodology of laboratory eyewitness identification studies has largely remained the same. People are exposed to a simulated crime, sometimes live, sometimes a video, and the researchers know the true identity of the culprit. These participant-witnesses are then shown an identification procedure, typically a photo lineup, in which the culprit's photo is embedded among filler photos or the culprit's photo is absent from the array and replaced with the photo of an innocent person. Using this basic paradigm, researchers then systematically manipulate variables, such as the view the witness had of the culprit, the similarity of the fillers to the culprit, the instructions given to the eyewitness prior to viewing, suggestive behaviors of the lineup administrator, and so on, to see how those variables affect the responses of the eyewitnesses. This experimental laboratory methodology has a number of strengths that arise from the fact that "ground truth" is known (i.e., the researchers know which person is the actual "culprit") and from the use of random assignment to conditions that permit inferences about the cause of any effects observed in responses.

One type of data that was largely unavailable at the time of the 1998 review comes from published field studies of police lineups. By field study we mean either an archival or prospective examination of the results of lineups conducted by police investigators in actual cases. To be included as a field study in our analysis, the

study had to report how often the eyewitnesses identified the suspect, identified a filler, or made no identification and the study had to be published in a peer-reviewed journal. Only one field study had been published in a peer-reviewed journal at the time of the 1998 review but now there are 11 peer-reviewed published field studies. In these field studies of lineup outcomes, the lineup contains “fillers” who are known to be innocent of the crime (such as people who were in prison at the time of the crime). If the eyewitness identifies the suspect, it might or might not be an accurate identification because ground truth is not known with certainty in actual cases. But when an eyewitness identifies a filler, it is clearly a mistaken identification because these fillers are known to be innocent. A mistaken identification of a filler will not result in charges against that filler, but a filler identification is a mistaken identification nevertheless. These field studies have clear limits, in large part because of the difficulty of establishing ground truth for identifications of suspects (i.e., not knowing whether the suspect is innocent or guilty, see [Horry, Halford, Brewer, Milne, & Bull, 2014](#)). However, these field study data help counter some of the criticisms of laboratory-based experiments—in particular, the criticism that participants in laboratory experiments make a lot of mistaken identifications only because the witnessed events are not real and the consequences of mistaken identification are trivial ([Mecklenburg, Bailey, & Larson, 2008](#)). The argument is that real witnesses to serious crimes would not be so careless. Hence, perhaps laboratory studies vastly overestimate the eyewitness misidentification problem. The results of peer-reviewed field studies, however, show otherwise.

Based on these field studies, we can now estimate how often actual eyewitnesses in serious crime cases mistakenly identify a filler from a lineup. These 11 peer-reviewed published studies collected data from a total of 6,734 lineups. These field studies are from highly varied jurisdictions (e.g., California, Arizona, Texas, London, England) and a summary of these data is shown in [Table 1](#). For current purposes, two statistics of note from [Table 1](#) speak to the question of whether actual witnesses to serious crimes are too cautious to make mistaken identifications at rates like those observed in lab experiments. First, nearly one of every four witnesses (23.7%) who was shown a lineup selected an innocent filler. Second, among those who made an identification (35.5% made no identification), over one third (36.8%) identified a known-innocent filler. A summary of 94 laboratory eyewitness identification studies showed that filler identification rates averaged 21.2% when the culprit was present and 34.6% when the culprit was absent ([Clark, Howell, & Davey, 2008](#)). Averaging these two filler identification rates from lab studies yields 27.9% filler identifications in the average laboratory study versus 23.7% filler identifications found in actual cases. These field study data, which were not available at the time of the 1998 scientific review paper, suggest that experimental laboratory studies are not producing highly inflated rates of mistaken identification compared with what happens with actual eyewitnesses to serious crimes. Of course, lab experiments and actual eyewitness identification cases differ in many ways. For example, actual eyewitness cases involve longer retention intervals, more violence, and more guns than do lab studies (see [Flowe, Carline, & Karoglu, 2018](#)). Nevertheless, lab studies are particularly valuable for isolating cause-effect relations among variables, which is a feature that tends to elude field studies for a variety of reasons (see [Horry et al., 2014](#)).

Table 1
Summary Statistics on 11 Published Field Studies of Eyewitness Identification

Authors	Number of possible IDs	ID of suspect	IDs of filler	No ID	Suspect %	Filler %	No ID%	% Making an ID	Suspect ID rate among all IDs	Filler ID rate among all IDs
Behrman and Davey (2001)	58	29	14	15	50.0%	24.1%	25.9%	74.1%	67.4%	32.6%
Behrman and Richards (2005)	461	238	68	155	51.6%	14.8%	33.6%	66.4%	77.8%	22.2%
Horry, Halford, Brewer, Milne, and Bull (2014)	833	382	149	302	45.9%	17.9%	36.3%	63.7%	71.9%	28.1%
Horry, Memon, Wright, and Milne (2012)	1,039	406	273	360	39.1%	26.3%	34.6%	65.4%	59.8%	40.2%
Klobuchar, Steblay, and Caligiuri (2006)	178	63	20	95	35.4%	11.2%	53.4%	46.6%	75.9%	24.1%
Memon, Havard, Clifford, Gabbert, and Watt (2011)	1,044	456	437	151	43.7%	41.9%	14.5%	85.5%	51.1%	48.9%
Valentine, Pickering, and Darling (2003)	584	237	121	226	40.6%	20.7%	38.7%	61.3%	66.2%	33.8%
Wells, Steblay, and Dysart (2015)	494	132	75	287	26.7%	15.2%	58.1%	41.9%	63.8%	36.2%
Wixted, Mickes, Dunn, Clark, and Wells (2016)	348	114	104	130	32.8%	29.9%	37.4%	62.6%	52.3%	47.7%
Wright and McDaid (1996)	1,561	611	310	640	39.1%	19.9%	41.0%	59.0%	66.3%	33.7%
Wright and Skagerberg (2007)	134	78	28	28	58.2%	20.9%	20.9%	79.1%	73.6%	26.4%
Overall sum	6,734	2,746	1,599	2,389	40.8%	23.7%	35.5%	64.5%	63.2%	36.8%
Weighted means										

Note. Some studies reported data that included identifications by witnesses who knew the culprit (prior familiarity) and those data are excluded from [Table 1](#).

In addition to a large growth in the number of peer-reviewed laboratory-based experiments, as well as the addition of field studies of lineups in actual cases, DNA exoneration cases involving mistaken eyewitness identification have continued to accumulate since the 1998 review paper. As of this writing, DNA has established that at least 365 people in the U.S. were convicted and imprisoned (some on death row) for crimes they did not commit (Innocence Project, 2019). More than 70% of these DNA exoneration cases involved mistaken eyewitness identification. Although the number of DNA exonerations represent only a small fraction of convictions, it is essential to note that these exonerees were the lucky few for whom DNA-rich trace evidence for the crime existed, was collected and preserved properly, and was tested. Contrary to public perceptions based on TV programs, culprits leave behind DNA-rich trace evidence in only a small fraction of cases. The largest category of convictions based on eyewitness identification evidence is robberies, and culprits of robbery almost never leave behind DNA-rich trace evidence that could exculpate a mistakenly identified person. For cases in which DNA did exist (primarily restricted to sexual assault cases), no one anticipated that forensic DNA testing would later develop and so for many cases prior to the advent of forensic DNA testing, the trace evidence was not collected, was not preserved properly (allowing it to deteriorate), was lost, or was destroyed by the time forensic DNA testing came along. Even today, individuals who claim innocence may not be permitted by statute or discretionary decision (by a court or a prosecutor) to access and test available DNA evidence. Hence, DNA testing could only reverse a very small fraction of possible mistaken identifications. Indeed, eyewitness identification evidence is still heavily relied upon today because DNA and other forms of definitive evidence remain extremely rare. Improving the reliability of eyewitness identification evidence therefore remains an important priority in preventing miscarriages of justice.

Focus of the Current Article

The current article, like the 1998 scientific review paper, is not a broad review of all issues in eyewitness identification. It is, instead, a focused examination of *system variables* in eyewitness identification: factors that relate to the reliability of eyewitness identifications over which the justice system has (or can have) control. Hence, despite the fact that there are many powerful variables that affect the reliability of eyewitness identification evidence, which are called *estimator variables* (e.g., same vs. cross-race identifications, stress during the witnessing of a crime, quality of view), such variables are not under control of the justice system and are therefore not the focus of this scientific review paper.

In some ways, the definition of system variables that is used today has broadened from its original definition. Originally, system variables in eyewitness identification referred to variables that *influence the accuracy of eyewitness identifications* over which the justice system has control (Wells, 1978). Over time, however, the definition of system variables has broadened to include factors under the control of the justice system that *relate to* (as opposed to *influence*) the accuracy of eyewitness identifications. Eyewitness confidence, for example, does not itself influence the accuracy of an eyewitness identification; however, eyewitness confidence is

related to the accuracy of eyewitness identification and it is easily contaminated by events that *are* under the control of the criminal justice system (such as feedback from the lineup administrator). Accordingly, securing a confidence statement at the time of identification using a double-blind lineup administrator is a system variable (see Wilford & Wells, 2013, for a more extended discussion of this broader view of system variables).

In the current article, other examples of this broader definition of system variables will become apparent. For example, one of the recommendations in the current scientific review paper is video-recording the entire identification procedure. Obviously, video-recording the identification procedure is not meant to increase the accuracy of eyewitness identifications. Instead, the purpose of the video-recording recommendation is to secure a record that might help to assess the quality of the identification and the procedure (Sporer, 1992, 1993). That is, a video can shed light on the likely accuracy of eyewitness identifications via creating a record of behavioral cues (such as decision time, spontaneous comments, and confidence cues) that are diagnostic of accuracy (Kaminski & Sporer, 2017). In addition, video-recordings of the identification procedure can help document that police followed recommended procedures and provide other potential benefits as discussed later in this article. Using the broader definition, video-recording qualifies as a system variable because it is under the control of the justice system to either video-record or not record, and the recording is relevant to the eyewitness accuracy problem.

A central issue in the development of recommendations on policies and procedures in eyewitness identification is how to decide which recommendations are the most important and what criteria should be used to decide whether to include a recommendation. For most of our recommendations, there is a solid and specific body of scientific evidence to support the recommendation and we review that scientific evidence. In some cases, however, the recommendation is based primarily on reasonably well-established understandings of human memory and social influence and our general understanding of problems that we have observed in actual cases. Consider, for example, our recommendation that the entire identification procedure be video-recorded. We believe that video-recording can have many benefits, including but not restricted to: moderating potential suggestive behaviors by the lineup administrator, establishing proof as to exactly what instructions were given to the eyewitness, recording information about how long it took the eyewitness to make an identification, and establishing both verbal and nonverbal records of the confidence expressed by the eyewitness. We believe that the arguments favoring this recommendation are compelling and elements of the recommendation are grounded in the science, such as the science showing that the verbal and nonverbal behaviors of the witness during the lineup are diagnostic of accurate versus mistaken identifications (e.g., Kaminski & Sporer, 2017). Hence, video-recording could be justified on that scientific ground alone. However, there has been little research on the issue of whether video-recording serves a prophylactic function, how the videos should be used, or on whom the camera should be focused. Hence, not every element of the benefits that we propose for video-recording of the identification procedure have been fully studied. Nevertheless, we believe that it would be irresponsible to not include a video-recording recommendation even if a subset of the benefits (e.g., its prophylactic function) has not yet been thor-

oughly demonstrated. For each of the recommendations that we offer, we include justifications for the recommendation as well as a discussion of any concerns or caveats.

Live Versus Photo Lineups

Throughout this article, we use the term lineup to refer to both live lineups and photo lineups. We do not include separate sections on these two common procedures because we know of no evidence to indicate that the principles governing photo lineups and live lineups are different (see Fitzgerald, Price, & Valentine, 2018). In other words, every recommendation that we make about lineups applies equally to live and photographic displays.

Photo lineups are far more common than live lineups in most U.S. jurisdictions (Police Executive Research Forum, 2013). Photo lineups are sometimes called photo-spreads, photo-arrays, or photo-montages. Another common name for photo lineups in many U.S. law enforcement circles is “six packs,” which refers to the most frequent size and arrangement of a photo lineup in which the lineup contains six photos arranged in two rows of three. Live lineups, sometimes called corporeal or physical lineups, are relatively rare (in research and in practice) compared with photo lineups, likely due to the greater difficulty, time, and expense of constructing and conducting live lineups relative to photographic lineups. But some jurisdictions, such as New York City, commonly conduct both live and photo lineups.

Even though the principles governing live versus photo lineups are thought to be the same, questions have been raised as to whether performance overall might be better for live lineups than for photo lineups. The *live-superiority hypothesis* predicts that the three-dimensional nature of a live showing (vs. two-dimensional photos) of the lineup members, along with having visual information about the full-bodies (not just faces) of the lineup members, would clearly render live lineups superior to photo lineups. However, a review of the scientific evidence comparing live with photo lineups (as well as video lineups) showed no support for the live-superiority hypothesis (Fitzgerald et al., 2018). In addition, there are a number of practical difficulties involved in organizing and administering live lineups, including the greater difficulty of finding appropriate fillers for live lineups, and the need to carefully orchestrate the timing and roles of various people at the lineup event. Some problematic elements are also difficult to control in live lineups, such as the appearance of nervousness on the part of the suspect, a nervousness not likely to be shared by fillers. Because of the apparent absence of any significant advantage in accuracy along with the greater practical difficulty of live lineups, “live lineups are rarely the best option in practice” (Fitzgerald et al., 2018, p. 307).

We take no position on live versus photo because preference for one over the other is likely to depend on the circumstances of the particular case. For example, if the witness described something distinctive about the body of the culprit or the culprit’s gait, then a live lineup might be preferred. But the difficulty of constructing such a lineup with live fillers who match the witness’s description of the culprit can be very challenging. Also, it is not uncommon for a suspect to be at-large, which precludes the use of a live lineup. In other cases, the stress induced when a victim-witness is asked to view their assailant live for purposes of identification might cause difficulties that could be avoided with a photo lineup. Some law

enforcement agencies have used live lineups because there were reasons to believe that the witness might be able to identify the culprit’s voice by having lineup members speak which, of course, is not possible while doing a photo lineup. Of course, doing a photo lineup does not preclude a later voice lineup with that suspect using only recorded voices and no visual information. In fact, some have argued that voice identification should be conducted separately from the visual lineup because the diagnosticity of the information obtained is greater if the witness can identify the voice and the face independently of each other (Pryke, Lindsay, Dysart, & DuPuis, 2004). Hence, conducting photo lineups does not preclude the identification of voices using a separate procedure.

Lineups as Distinguished From Showups

The 1998 scientific review paper dealt only with lineups, but there is another common identification procedure, called showups, that is included in this new scientific review paper. The basic distinction between lineups and showups is that lineups embed the suspect among known-innocent fillers whereas showups do not use fillers and instead simply present the suspect alone. There is no debate among eyewitness scientists about the fact that lineups produce better outcomes than do showups, whether the outcomes are measured in terms of diagnosticity ratios or measured using signal-detection based methods. There is some debate about the *process* by which the outcomes for lineups are superior to the outcomes for showups. For example, it has been suggested that the use of good lineup fillers can help the witness decide which facial features are relevant for making an identification decision (e.g., Wetmore et al., 2015; Wixted & Mickes, 2014). Others, however, note that lineups appear to be superior to showups only because a large share of mistaken identifications are siphoned off to fillers when lineups are used whereas *all* mistaken identifications land on the innocent suspect for showups because showups have no fillers (e.g., see Smith, Wells, Lindsay, & Penrod, 2017; Wells, Smith, & Smalarz, 2015). These two accounts of how lineups manage to produce better outcomes than showups are very different, but no eyewitness scientist contests the general observation that lineups with good fillers result in better applied outcomes than do showups.

If there is no question about the superiority of lineups over showups, why do we have recommendations about how showups should be conducted? Why not simply state that showups should never be conducted and that lineups should be conducted instead? There have been calls by some eyewitness scientists for the elimination of showups based on the clear evidence that showups are inferior to lineups (see Levi & Lindsay, 2001). But there are legal and policy reasons to permit showups under certain conditions even though a lineup would be more diagnostic. We review those reasons in the section that details the showups recommendation.

As a final note, it should be apparent that there should never be such a thing as a photographic showup. After all, the justification for a showup is that the individual has been detained on the street and there is a very limited time frame for conducting an identification procedure. If investigators are merely in possession of a photo of a suspect, there is no reasonable excuse for not taking the time to embed the photo among filler photos and conduct a proper photo lineup.

Overview of Recommendations

The 1998 scientific review paper had only four recommendations. The current scientific review paper endorses these same four recommendations but expands the number of recommendations to nine. The original four recommendations in the 1998 scientific review paper included: (a) the identification procedure should be administered using a *double-blind* procedure (i.e., the lineup should be administered by someone who does not know which person is the suspect and which persons are fillers); (b) *prelineup instructions* to the witness should emphasize that the culprit might or might not be in the lineup and that the lineup administrator does not know which person is suspected of being the culprit; (c) there should be only *one suspect per lineup and the suspect should not stand out* from the fillers based on the witness's description of the culprit or other factors that would draw attention to the suspect; and (d) a *confidence statement* should be secured from the witness at the time of identification and prior to any opportunity to get feedback about the identification decision. Although we include these four recommendations in our new set of nine, we have modified them in certain ways. For example, the double-blind recommendation now includes other means for accomplishing the goal of preventing influence from the lineup administrator that do not necessarily require a neutral administrator. The prelineup instructions include reworked language that is intended to make the instructions more effective. Finally, the securing of a confidence statement includes the recommendation of recording a confidence statement for both affirmative identification decisions and rejection decisions rather than only if the eyewitness makes an affirmative identification decision.

The original four recommendations in the 1998 scientific review paper were restricted almost exclusively to matters that occurred only during the lineup itself. Some of the five new recommendations, however, cover broader territory. For example, new recommendations concern matters that occur *before* the commencement of an identification procedure, including consideration of when it might be unwise to conduct an identification procedure, the problem of repeated identification procedures with the same witness and suspect, and the importance of conducting a proper interview of the witness prior to conducting the identification procedure. In addition, we make a recommendation concerning the appropriate use of showups.

The following is a brief description of each of the nine recommendations. The numeric order of the recommendations corresponds roughly to the temporal order in which police/administrators would likely encounter the matters covered by the recommendation (except for the last recommendation, which concerns showups).

1. **Prelineup Interview Recommendation.** Before conducting an identification procedure and as soon as practicable after the commission of the crime, an officer should interview witnesses to document their descriptions of the culprit, obtain their self-report of viewing conditions and attention during the crime, document any claims of prior familiarity with the culprit, instruct witnesses to not discuss the event with other cowitnesses, and warn the witnesses against attempting to identify the culprit on their own. The entire interview should be video-recorded.
2. **Evidence-Based Suspicion Recommendation.** There should be evidence-based grounds to suspect that an individual is guilty of the specific crime being investigated before including that individual in an identification procedure and that evidence should be documented in writing prior to the lineup.
3. **Double-Blind (or Equivalent) Recommendation.** Lineups should be conducted using a double-blind procedure (i.e., neither the administrator nor the witness should know who the suspect is in the lineup) or an equally effective method of preventing the lineup administrator from inadvertently influencing the witness.
4. **Lineup Fillers Recommendation.** There should be only one suspect per lineup and the lineup should contain at least five appropriate fillers who do not make the suspect stand out in the lineup based upon physical appearances or other contextual factors such as clothing or background.
5. **Prelineup Instructions Recommendation.** When inviting an eyewitness to attend a lineup procedure (photo lineup or live lineup), police should not inform the eyewitness of any information that the witness has not already provided and certainly should not suggest that the suspect who will be in the lineup has been arrested or that the culprit will be present in the identification procedure. The eyewitness should be instructed that (a) the lineup administrator does not know which person is the suspect and which persons are fillers; (b) the culprit might not be in the lineup at all, so the correct answer might be "not present" or "none of these"; (c) if they feel unable to make a decision they have the option of responding "don't know"; (d) after making a decision they will be asked to state how confident they are in that decision; and (e) the investigation will continue even if no identification is made.
6. **Immediate Confidence Statement Recommendation.** A confidence statement should be taken from witnesses as soon as an identification decision (either positive or negative) is made.
7. **Video-Recording Recommendation.** The entire identification procedure, including prelineup instructions and witness confidence statement, should be video-recorded.
8. **Avoid Repeated Identifications Recommendation.** Repeating an identification procedure with the same suspect and same eyewitness should be avoided regardless of whether the eyewitness identified the suspect in the initial identification procedure.
9. **Showups Recommendation.** Showups should be avoided whenever it is possible to conduct a lineup (e.g., if probable cause exists to arrest the person then a showup should not be conducted). Cases in which it is necessary to conduct a showup should use the procedural safeguards that are recommended for lineups, including the

elimination of suggestive cues, a warning that the detained person might not be the culprit, video-recording the procedure, and securing a confidence statement.

In the detailed treatments of the nine recommendations that follow, we placed a strong emphasis on communicating an underlying principle for each recommendation. The underlying principle for a recommendation is important because there can be times in which circumstances might require deviation from the literal specifics of the recommendation, but the deviation would still be able to conform to the underlying principle. For example, our recommendation for how to select fillers to use in a lineup is relatively specific but, in the end, it is more important that the underlying principle be achieved, namely that the fillers should be chosen in a way that would not make an innocent suspect stand out in the lineup. Hence, although we provide specific recommendations, it is more important to use procedures that reflect the principles behind the recommendations than to follow the specific recommendations.

Recommendations

Each of the nine recommendations begins with a statement of the recommendation. We then describe the rationale for the recommendation, including relevant data and the reasoning behind the recommendation. In addition, most of the recommendations have nuances or caveats, and some have practical concerns that are discussed.

Recommendation 1: Prelineup Interview

Before conducting an identification procedure and as soon as practicable after the commission of the crime, an officer should interview eyewitnesses to document their descriptions of the culprit, obtain their self-report of viewing conditions and attention during the crime, document any claims of prior familiarity with the culprit, instruct witnesses to not discuss the event with other cowitnesses, and warn the witnesses against attempting to identify the culprit on their own. The entire interview should be video-recorded.

In many cases there might be 911 (emergency call) recordings or initial witness statements by first responders that can prove useful to an investigation; however, this recommendation concerns a more extensive interview that would be conducted by an investigative officer. Recommendation 1 relates to the conduct of this interview with a witness or victim, during which time an investigator collects a statement relating to the person's memory for the event and the culprit(s). Collection of a detailed description of the culprit is a critical form of evidence that can facilitate investigators' attempts to locate a suspect (Brown, Lloyd-Jones, & Robinson, 2008; Kebbell & Milne, 1998). There is now substantial research on the most effective procedures for interviewing a witness or victim following an event (see Dando, Geiselman, MacLeod, & Griffiths, 2015; Fisher, Schreiber Compo, Rivard, & Hirm, 2014), as well as the harmful effects of suggestive or misleading interviewing procedures that should be avoided (see Brainerd & Reyna, 2005; Loftus, 2017; Newman & Garry, 2013). Specific interviewing procedures have also been developed for the collection of *person descriptions* (see Demarchi & Py, 2009;

Gabbert & Brown, 2015; Meissner, Sporer, & Schooler, 2007; Satin & Fisher, 2019; Sporer, 1996). Although the current recommendations focus largely on the interviewing of adult witnesses, many of the same principles of memory apply to the interviewing of child witnesses (who are particularly susceptible to suggestion, see Ceci & Bruck, 1995). A robust literature is available for interested readers documenting the challenges of interviewing child witnesses (see Kask & Bull, 2009), including the development of effective, evidence-based protocols for interviewing children (see LaRooy et al., 2015; Sternberg, Lamb, Esplin, Orbach, & Hershkowitz, 2002).

The Contents and Accuracy of Person Descriptions

Obtaining an accurate and complete description of the culprit is important to furthering an investigation and ultimately can facilitate identification of the culprit. Archival studies suggest that witnesses tend to provide between seven and nine descriptors of a culprit on average, frequently including information about perceived height, weight, gender, ethnicity, and age (Fahsing, Ask, & Granhag, 2004; Granhag, Ask, Rebelius, Öhman, & MacGiolla, 2013; Sporer, 1992, 1996; van Koppen & Lochun, 1997; Yuille & Cutshall, 1986). Descriptions of the culprit's clothing, stature, and facial features are generally less frequent. When specific facial descriptors are provided, the majority refer to upper regions of the face, in particular the hair, eyes, and nose. Although estimates of height, weight, and age can be biased by the witness's own characteristics (e.g., individuals who are less than average height tend to underestimate height; see Flin & Shepherd, 1986), witnesses otherwise appear to provide an accurate, general impression of the culprit. Such descriptions, however, are often lacking in specific details (Douglass, Brewer, Semmler, Bustamante, & Hiley, 2013; Fahsing et al., 2004) that might prove useful for the construction and assessment of identification arrays (Corey, Malpass, & McQuiston, 1999), and it is therefore important that investigators use evidence-based procedures to enhance the quality of witnesses' accounts.

System Variables That Influence the Quality of Witness Accounts

Much like other memory phenomena, a host of factors can influence the accuracy and completeness of a witness's memory for the event and culprit (see Granhag, Ask, & MacGiolla, 2013; Meissner et al., 2007). Consistent with the general eyewitness literature, a distinction can be drawn between system and estimator variables (Wells, 1978). With respect to the former, the manner in which a witness is interviewed by an investigator can undermine the accuracy of a witness's statement. In particular, witnesses appear quite susceptible to the misinformation effect (see Berkowitz & Loftus, 2018; Loftus, 2017; Newman & Garry, 2013) in which leading or suggestive questioning from an investigator can distort memory reports, and witnesses can be induced to self-generate errors in their descriptions when forced or encouraged to provide a "complete" description of the event or culprit (Ackil & Zaragoza, 1998; Meissner, Brigham, & Kelley, 2001). In this respect, the use of facial feature checklists is not recommended, as they can subtly encourage "complete" responses that produce less accurate person descriptions (Wogalter, 1991, 1996). Finally, ex-

posure to media coverage of an incident before an interview can also lead witnesses to recall incorrect details that were suggested or inferred (Crombag, Wagenaar, & van Koppen, 1996), and contact with other witnesses can similarly introduce systematic errors in memory (Gabbert, Memon, & Allan, 2003; Gabbert, Memon, Allan, & Wright, 2004; Eisen, Gabbert, Ying, & Williams, 2017; Loftus & Greene, 1980). We recommend that investigators *avoid* suggestive or leading interviewing practices and that they instruct witnesses *not to discuss* their accounts with or in front of one another. Whereas it is possible that discussions between witnesses could lead to an increase in reported details (e.g., Vredeveldt, Hildebrandt, & van Koppen, 2016), the dangers associated with contamination suggest that witnesses should be interviewed individually to preserve the independence of each statement. Investigators should also document whether a witness has spoken previously with other witnesses or has been exposed to media reports related to the incident.

Documenting Factors That Can Influence the Quality of Witness Accounts

It is also important that investigators note the conditions under which the witness may have viewed or interacted with the culprit, as certain factors can influence the likely quality of a witness's recollection (for a review see Meissner et al., 2007). Documenting such factors can aid both investigators and fact finders in assessing the likely reliability of a witness's memory. With respect to naturally occurring estimator variables, factors at the time of encoding such as low illumination (Wagenaar & van der Schrier, 1996), greater distance from the culprit (Loftus & Harley, 2005), and limited time of exposure can lead to poorer quality person descriptions (Sporer, 1992; van Koppen & Lochun, 1997; Yarmey, 1986; Yarmey, Jacob, & Porter, 2002). The presence of a weapon can draw attention away from the culprit's appearance (Fahsing et al., 2004; Fawcett, Russell, Peace, & Christie, 2011; Kocab & Sporer, 2016; Pickel, 1998, 1999). The consumption of alcohol or drugs by a witness can similarly reduce the amount of information provided (Flowe, Takarangi, Humphries, & Wright, 2016; Read, Yuille, & Tollstrup, 1992; Schreiber Compo et al., 2017; Yuille & Tollstrup, 1990). Extensive delays between encoding and the time of interviewing can diminish the amount of detail provided by a witness (Ellis, Shepherd, & Davies, 1980; Meissner, 2002; Tuckey & Brewer, 2003; van Koppen & Lochun, 1997). In contrast with the previous factors, prior familiarity with the culprit (i.e., an individual known to the witness) generally increases the accuracy of a witness's description and identification (Vallano, Steele, Slapinski, Briggs, & Pozzulo, 2019). Given the influence of these estimator variables on both the quality of person descriptions and subsequent attempts to identify the culprit from a lineup, it is recommended that investigators clearly document the presence of such factors in their report.

Evidence-Based Approaches for Interviewing Witnesses and Victims

Acquiring a complete, yet accurate, statement from the witness is critical to furthering an investigation. Considerable research

has documented the most effective methods for interviewing a witness or victim (Dando et al., 2015; Fisher et al., 2014). In general, it is common for investigators to invite an *open-ended response* from the witness, followed by *specific probes* associated with key details such as the culprit's physical characteristics (e.g., height, build, age, race, sex, etc.), clothing, or any distinguishing characteristics (Brown et al., 2008; Launay & Py, 2015; Wise, Safer, & Maro, 2011). The use of open-ended, nonsuggestive questioning tactics (Clarke, Milne, & Bull, 2011; Walsh & Bull, 2010) is recommended for eliciting a complete narrative from the witness. Although the use of specific probes can increase the number of details provided, such details may come at the expense of lower accuracy of responding (Sauerland, Krix, van Kan, Glunz, & Sak, 2014). As such, caution should be used in moving to closed-ended or two-alternative questions and the use of suggestive/leading prompts should be avoided altogether.

Evidence-based interviewing protocols have been developed that both avoid the pitfalls of leading and suggestive questioning and enhance witness reporting by facilitating the retrieval of information from memory. One of the most notable and empirically validated protocols is the Cognitive Interview (Fisher & Geiselman, 1992). A robust literature has demonstrated the effectiveness of the Cognitive Interview for eliciting both detailed event narratives and person descriptions from cooperative witnesses (Memon, Meissner, & Fraser, 2010). Several instructional and mnemonic aspects of the Cognitive Interview appear to be particularly useful, including: (a) encouraging witnesses to "report all" of the information they can recall but not to guess about anything they are unsure of (e.g., Clifford & George, 1996); and (b) using context reinstatement by asking witnesses to close their eyes and think back to the event context (e.g., Smith-Spark, Bartimus, & Wilcock, 2017; Vredeveldt, Baddeley, & Hitch, 2012, 2014). Lab-based research indicates that the Cognitive Interview (compared with a standard police interview) increases the number of descriptors of the culprit and increases the chances that using the description can lead to finding the culprit's photo among a larger set of photos (Satin & Fisher, 2019). The increase in descriptors for the Cognitive Interview is typically quite large for correct details; and although a small increase in incorrect details has been noted across studies, the accuracy rate for the Cognitive Interview does not differ from that of a standard interview (see Memon et al., 2010). We encourage investigators to seek training in and adopt the Cognitive Interview protocol when interviewing witnesses and victims.

Another specific protocol for eliciting person descriptions, termed the Person Description Interview, significantly increases the quantity of person descriptors provided by witnesses (Demarchi & Py, 2009; Demarchi, Py, Groud-Thau, Parain, & Brunel, 2013). The Person Description Interview incorporates two key instructions to the witness with respect to describing a person of interest: (a) to provide general information about the person before moving to specific featural aspects of the face, and (b) when describing the face to begin with the lower regions of the face (chin and lips) and to move up to the top regions (eyes and hair). Consistent with the Person Description Interview instructions, encouraging witnesses to provide more general, coarse-grained information during an interview can enhance the quantity of information absent a cost to accuracy (Brewer, Vagadia, Hope, & Gabbert, 2018).

Finally, although witness descriptions are frequently collected via an oral interview conducted by an investigator, at times a witness may be asked to directly provide a written statement. There is mixed evidence with respect to how the format for eliciting a witness's recall might influence the quantity and quality of information provided, with some studies suggesting that oral interviews produce more information from witnesses than does written statements (Kraus, Zeier, Wagner, Paelecke, & Hewig, 2017; Sauerland & Sporer, 2011) and others finding no difference as a function of modality (McPhee, Paterson, & Kemp, 2014; Sauerland et al., 2014). A recently developed protocol, referred to as the Self-Administered Interview (see Hope, Gabbert, & Fisher, 2011), allows cooperative witnesses to self-generate high-quality descriptions of their experience. The Self-Administered Interview prompts witnesses to recall details of the event, including a person description of the culprit (e.g., hair, complexion, build, distinguishing features). To facilitate recall, the Self-Administered Interview incorporates the two key elements of the Cognitive Interview as previously described—a “report everything” instruction and a context reinstatement prompt. The Self-Administered Interview has been shown to significantly increase the quantity of person descriptors when compared with a standard free recall prompt, at a level comparable with that of the Cognitive Interview (Gabbert, Hope, & Fisher, 2009; Hope, Gabbert, Fisher, & Jamieson, 2014). Such an interview protocol is particularly useful when an incident involves many possible witnesses or victims and when such conditions could lead to significant delays in eliciting a statement from witnesses or victims.

Finally, we recommend that all interviews with witnesses should be video-recorded. Such an objective record of the interview will allow both investigators and fact finders the opportunity to review the information provided the witness and evaluate its evidential value. Importantly, studies suggest that investigators fail to accurately record or recall key details of statements provided in interviews (Kassin, Kuckucka, Lawson, & DeCarlo, 2017; Lamb, Orbach, Sternberg, Hershkowitz, & Horowitz, 2000); thus, recording the interview with a witness provides an objective record of the information elicited, absent omissions or errors that may be introduced via the investigators' recollection of the interview. Lastly, the interview should be video-recorded from a perspective that captures both the investigator and the witness, as studies suggest that this perspective can enhance fact finders' evaluations of the evidence (Lassiter, 2010; Lassiter, Ware, Ratcliff, & Irvin, 2009; Ratcliff, Lassiter, Schmidt, & Snyder, 2006).

Instructions to Witnesses Following an Interview

Interviewers should instruct witnesses to not discuss the witnessed event or what they have told investigators with other potential witnesses in the case. As noted earlier, when eyewitnesses talk with each other about their memories, they can influence one another such that their subsequent individual memory reports can become contaminated with what others have recalled (for reviews, see Gabbert & Hope, 2013; Wright, Memon, Skagerberg, & Gabbert, 2009). Encountering a piece of misinformation from a cowitness about a facial feature can lead witnesses to later misidentify someone from a lineup who has that feature (e.g., Eisen et al., 2017; Zajac & Henderson, 2009). Moreover, hearing that a cowitness had made an identification from a lineup can

increase the chances that a witness would also make an identification; hearing that a cowitness identification was made more confidently, as opposed to less confidently, can also increase the confidence that a witness expresses in the accuracy of their own identification (Levett, 2013). It is recommended (a) that witnesses should be cautioned to avoid discussing the case with others and (b) that investigators should refrain from sharing any information that other witnesses had previously provided. As with the lineup identification procedure (see Recommendation 7), we recommend that the entire prelineup interview be video-recorded.

Finally, interviewers should instruct witnesses not to conduct their own investigation of the crime. Increasingly, we are seeing that the first identification that witnesses make is the result of a self-directed search on the Internet, including social media sites. These searches by witnesses lack many of the protections of a well-conducted lineup; all faces viewed are possible suspects, there are no instructions reminding the witnesses that the culprit may not be among the faces they viewed, some faces may stand out more than others, witnesses might engage in these searches alongside cowitnesses, and there is no recording of confidence immediately after the identification. Once this initial identification of a suspect is made through an Internet search, it is not possible to conduct an uncontaminated identification procedure using better methods (see Recommendation 8).

Recommendation 2: Evidence-Based Suspicion

There should be evidence-based grounds to suspect that an individual is guilty of the specific crime being investigated before including that individual in an identification procedure and that evidence should be documented in writing prior to the lineup.

Conducting lineups in the absence of evidence-based reasons for suspicion is a risk factor for mistaken identification. In the parlance of eyewitness science, making an individual the focus of a lineup in the absence of evidence that the individual is likely to be the culprit (e.g., having only a hunch) contributes to a low base rate for culprit-present lineups (i.e., a high base rate for culprit-absent lineups). In the case of lineups, base rate refers to the rate for which the suspect in the lineup is guilty versus innocent. A proper lineup contains only one suspect, who might or might not be the culprit (see Recommendation 4). It follows from this structure of lineups that a mistaken identification of an innocent suspect cannot happen with a culprit-present lineup and, of course, an identification of the culprit cannot happen with a culprit-absent lineup (Wells & Turtle, 1986). Therefore, low base rates for culprit-present lineups (high base rates for culprit-absent lineups) create fertile ground for mistaken identifications of innocent suspects and reduce the chances of identifying the culprit. Moreover, culprit-absent lineups inflate the rate at which eyewitnesses identify known-innocent fillers (Smith, Wilford, Quigley-McBride, & Wells, 2019), thereby tainting that witness's credibility for any later lineup that might include the culprit.

The evidence-based suspicion recommendation derives from the observation that there are no laws or other mechanisms in place to prevent jurisdictions from making investigative decisions that result in extremely low base rates for culprit-present lineups (i.e., a high rate of culprit-absent lineups; Wells, 2006). In fact, the only study of actual lineups to estimate the base rate for culprit-present lineups in any jurisdiction (in this case the Houston, Texas Police

Department) yielded an estimate of a mere 35% (Wixted, Mickes, Dunn, Clark, & Wells, 2016). If this estimate is correct for Houston, then the suspect was innocent in 65% of their lineups. Another field study found that 40% of the lineups (in Northern California jurisdictions) had no prelineup evidence at all indicating that the suspect was the culprit; and for an additional 30% of the lineups there was minimal evidence (Behrman & Richards, 2005). Moreover, a national survey of U.S. law enforcement agencies reported that more than one third of the agencies stated that they needed no evidence at all or needed only a mere hunch that a person might be the culprit before placing that person in a lineup (Wise et al., 2011). Of course, the base rate is likely to vary from one jurisdiction to the next depending on the practices and policies in place (Wells, 1993). Nevertheless, at the time of this writing we know of no jurisdiction in the U.S. whose policies or written procedures require, urge, or even mention that there should be some form of concrete evidence against a person before conducting an identification procedure focused on that person.

It is unclear why so many crime investigators do not seem to be concerned about the problem with having little or no evidence before placing someone in a lineup. Perhaps this lack of concern stems from an assumption that an eyewitness would not pick an innocent individual and would only pick someone if they remembered the person committing the crime.

The Importance of Base Rates

There are many studies in the basic judgment and decision-making literature showing that people struggle to grasp the strong impact that prior probabilities and base rates have on test outcomes (e.g., Kahneman & Tversky, 1973). To illustrate, it is perhaps instructive to draw a close analogy between eyewitness identification testing and medical diagnostic testing. In medical diagnostic testing, it is common for medical organizations to issue guidelines about when to perform diagnostic tests versus forgo such tests. Consider, for example, the prostate-specific antigen (PSA) test for prostate cancer (see Vollmer, 2006). Although the PSA test is just as accurate for men under 30 as it is for men over 50, almost every positive PSA test result on men under 30 is a false alarm whereas only a small fraction of positive PSA test results on men over 50 are false alarms. Because the base rate (or prior probability) that an under-30 male will have prostate cancer is nearly zero, almost every positive result is a false alarm.

This same principle applies to eyewitness identification procedures. In the case of lineups, the base rate is the rate at which the suspect in the lineup is guilty versus innocent. More formal treatments of the (Bayesian) mathematics behind this problem are available (see Wells, Yang, & Smalarz, 2015; Wixted & Wells, 2017), but a simple version of the problem is presented here. Assume that the chances that an innocent suspect will be identified from a culprit-absent lineup is 6% and the chances that a guilty suspect will be identified from a culprit-present lineup is 60%. Assume as well that the long-term base rate for culprit-present lineups is 50% (and the culprit-absent lineup base rate is therefore 50%). Suppose now that 1,000 lineups were conducted (500 culprit-present and 500 culprit-absent). We would expect 300 identifications of guilty suspects (60% of 500) and 30 identifications of innocent suspects (6% of 500). In this example, 330

suspects are identified and 9.1% of these suspects ($30/330 = .091$) are innocent.

Now suppose that, instead of a 50% base rate, the base rate were lowered to 30% (300 culprit-present lineups and 700 culprit-absent lineups). Now, the 1,000 lineups would be expected to yield 180 identifications of guilty suspects (60% of 300) and 42 identifications of innocent suspects (6% of 700). The result is that 222 suspects are identified ($180 + 42$) and 18.9% of these ($42/222 = .189$) are innocent. In this 30% base-rate example, the percentage of identified suspects who are innocent more than doubles compared to when the base rate is 50%. Clearly, things get better if the base rate for the suspect being guilty is increased to 70%. At a base rate of 70%, the 1,000 lineups would yield 420 identifications of guilty suspects (60% of 700) and only 18 identifications of innocent suspect (6% of 300). In this example, 438 suspects are identified ($420 + 18$) and only 4.1% are innocent.

Notice in the earlier examples that the eyewitnesses themselves are performing just as well when the base rate is 30% as they are when the base rate is 70% (just as the PSA test performs as well when used on men of age 30 as it does on men of age 60). The difference is that the 30% base rate allows for many more false alarms than does the 70% base rate. Every time a culprit-absent lineup is conducted, there exists some probabilistic jeopardy for an innocent suspect. Therefore, minimizing the chances of presenting witnesses with culprit-absent lineups is one way to reduce the problem of wrongful convictions.

Even when the witness does not identify the innocent suspect in a culprit-absent lineup, they often identify a known-innocent lineup filler (Clark & Wells, 2008; Wells & Lindsay, 1980; Wells & Olson, 2002; Wells et al., 2015). Most filler identifications are made with low confidence, clearly signaling their error-prone nature (Wixted & Wells, 2017); however, some are made with higher confidence. Suppose, for example, an eyewitness is shown a culprit-absent lineup and identifies a known-innocent filler. Later, police receive information about who the actual culprit is. It is too late to undo the fact that showing the eyewitness a culprit-absent lineup led the witness to identify a known-innocent filler as the culprit. This prior identification of a known-innocent filler makes the prosecution of any newly identified person in a later lineup substantially more difficult for prosecutors. In this sense, culprit-absent lineups not only create risk for innocent suspects but also elevate rates of filler identifications that, in turn, undermine eyewitnesses' credibility on any later identification opportunities that could involve a culprit-present lineup (Wells, Steblay, & Dysart, 2012).

What Is Evidence-Based Suspicion?

By evidence-based suspicion, we mean that there is articulable evidence that leads to a reasonable inference that a particular person, to the exclusion of most other people, likely committed the crime in question. As with other standards used in the legal system (such as reasonable suspicion or probable cause), there is no precise probability associated with the concept of evidence-based suspicion. However, a mere hunch is not evidence-based suspicion. Moreover, merely fitting a general description that the witness gave of the culprit (e.g., young male, mid-20s, dark hair, normal build) is not evidence-based suspicion as it could be applied to large numbers of people. Nor can this notion of

evidence-based suspicion be based on backward reasoning in which a pick of that person in the lineup is used retroactively to justify the placement of the person in the lineup. In other words, evidence-based suspicion is something that must be established prior to the lineup.

Not all articulable evidence qualifies as good evidence that connects a specific suspect to a specific crime. However, there are many possible examples of what could qualify as evidence-based suspicion for purposes of justifying the placement of an individual in a lineup identification procedure. Examples include:

- A unique fit to a specific description that was given by the eyewitness (e.g., blue teardrop tattoo under left eye; moon shaped scar on chin);
- Self-incriminating statements;
- Being in possession of materials linked to the crime along with a fit to the general physical description given by the eyewitness;
- Known to be in the area of the crime around the time of the crime along with a fit to the general physical description given by the eyewitness;
- Physical evidence at the crime scene linked to the person along with a fit to the general physical description given by the eyewitness;
- A unique pattern to the crime that is known to be associated with a particular offender along with a fit to the general physical description given by the eyewitness.

These examples of evidence-based suspicion are certainly not exhaustive. But they capture the idea that the evidence should be articulable, not based on mere hunch, and lead to a reasonable inference that there is individuating evidence that makes this person, to the exclusion of most other people, a reasonable candidate to be the one who committed the crime in question.

In contrast, articulable evidence that fails to link the suspect to the specific crime for which an identification is sought does not qualify as evidence-based suspicion. Some examples include:

- A search of police records reveals that the suspect was convicted of a similar crime in the same jurisdiction, has been released from prison, and is now living in the neighborhood where the crime was committed.
- There are multiple witnesses to a crime and the identification of the suspect made by the first witness is used to establish evidence-based suspicion for the remaining witnesses. If there was no articulable evidence for the first witness then the first lineup should never have been conducted.
- The suspect resembles a composite sketch or rendering of the culprit made with the assistance of the witness. This type of evidence does not clear the threshold of reasonable, articulable suspicion linking the suspect to the crime under investigation because composites do not reliably represent a recognizable representation of the culprit (Kovera, Penrod, Pappas, & Thill, 1997).
- A suspect who was apprehended in the vicinity of one crime happens to match the description of the culprit not only for that crime but also for several other similar crimes recently committed elsewhere in the community. If a witness to the crime committed in the vicinity of the suspect's apprehension does not identify the suspect, then there is no

evidence to support placing that suspect in lineups shown to witnesses to the other similar crimes committed elsewhere in the community. The nonidentification fails to establish any link between the suspect and the other similar crimes.

Again, this list of articulable evidence that does not meet criteria for evidence-based suspicion is not exhaustive. However, these examples illustrate that the evidence supporting the placement of a suspect in an identification procedure must be evaluated for whether it actually provides a nexus between the suspect and the crime witnessed.

Final Comments on Evidence-Based Suspicion

The medical field's understanding of the impact of base rates on medical diagnostic test outcomes is far ahead of the legal system's understanding of the impact of base rates in eyewitness lineup test outcomes (Wells et al., 2015). Furthermore, the concern about base rates in eyewitness identification might be even more important than are base rate concerns in medical testing because diagnostic medical tests can be repeated to confirm reliability of the result, or a different type of test can be performed to look for convergence of results. An eyewitness identification test, in contrast, cannot be repeated with that same witness and same suspect without being contaminated (see Recommendation 8); it is important to ensure that the chances of presenting eyewitnesses with a culprit-absent lineup are not unduly high.

Although our discussion of the importance of having evidence-based suspicion has been centered on the chances that an innocent suspect will be identified, there is an additional reason to be concerned about presenting eyewitnesses with a culprit-absent lineup. Even if the eyewitness does not identify an innocent suspect, culprit-absent lineups strongly increase the chances that the eyewitness will identify a filler (Wells, 1984; Wells et al., 2015). When an eyewitness identifies a filler, it "burns" the credibility of that eyewitness for purposes of any later identification (e.g., Wells et al., 2012). Suppose, for example, an innocent suspect was placed in a lineup, the eyewitness picks a filler, and investigators later discover evidence-based suspicion against a new suspect. Can they simply bring the eyewitness back and show the eyewitness a new lineup with the new suspect? The empirical data indicate that eyewitnesses who identify a filler from a culprit-absent lineup are highly error prone on any later lineup, even if that later lineup includes the culprit (Smalarz, Kornell, Vaughn, & Palmer, 2019). Moreover, research indicates that giving disconfirming feedback to witnesses who identify a filler reduces performance on subsequent identification tests (Palmer, Brewer, & Weber, 2010).

An evidence-based suspicion standard could be implemented easily by requiring detectives to present their proposal for conducting a lineup to a supervisor of detectives. The supervisor of detectives could then question the detective about why this lineup is being conducted with this particular person as its focus (Wells, 2006). The detective should be able to point to some concrete evidence that could lead to a reasonable inference that this person should be suspected of being the culprit in question; if not, a supervisor of detectives could suggest instead that the detective investigate further so as to have more confidence that the subject of the lineup is the culprit.

Although a lineup should be conducted only after establishment of evidence-based suspicion, eyewitness memory can fade with the passage of time. Hence, a lineup should be conducted as soon as possible after establishing evidence-based suspicion.

Recommendation 3: Double-Blind (or Equivalent)

Lineups should be conducted using a double-blind procedure (i.e., neither the administrator nor the witness should know who the suspect is in the lineup) or an equally effective method of preventing the lineup administrator from inadvertently influencing the witness.

A lineup administration is a social interaction between a witness and an administrator. Like in other social situations, interpersonal expectancies operate in the context of a lineup administration. Why is the social interaction aspect of lineup administration concerning? When someone has an expectation about how another is likely or ought to behave, this expectation can cause the person with the expectation to behave differently toward the target of the expectation. This change in the expectation-holder's behavior elicits the very behavior that was expected from the target (Harris & Rosenthal, 1985; Rosenthal, 2002; Snyder & Swann, 1978). The social interaction that takes place during the administration of a lineup is not immune from this interpersonal expectancy phenomenon. There is no presumption that the influence of the lineup administrator is intentional or even that the lineup administrator or witness is aware of the influence.

Lineups-As-Experiments

A lineup is a test of the hypothesis that the person whom the police suspect is in fact the culprit of the crime. The lineup administrator is fundamentally an experimenter who is conducting a procedure to test this hypothesis (Wells & Luus, 1990). Because people tend to test hypotheses in a way that will confirm their expectations (e.g., Klayman & Ha, 1987; Skov & Sherman, 1986), a lineup administrator, like any other experimenter, should follow protocols that will prevent them and their expectations from influencing the results of their tests. Double-blind testing, in which the lineup administrator does not know which person is the suspect and which are merely fillers (i.e., a blind administrator), is the best way of ensuring that any information that administrators have about which lineup member is the suspect will not influence the witnesses' behavior, including any identification decision they might make or their confidence in that decision (see also Recommendation 6 for a discussion of how double-blind administration eliminates the opportunity for postidentification feedback that could influence witness confidence). Double-blind testing can also prevent administrators' expectations from influencing their reports of witnesses' behaviors during the procedure. In contrast, single-blind lineup administration, in which the administrator knows which lineup member is the suspect and which are fillers (i.e., nonblind administrator), allows for the possibility that the administrator will communicate the identity of the suspect to the witness through intentional or unintentional verbal or nonverbal behaviors. In a single-blind lineup procedure, the eyewitness does not know which person is suspected of being the culprit and which ones are fillers, but the lineup administrator knows. In a double-blind lineup procedure, neither the eyewitness nor the lineup administrator

knows which person is suspected of being the culprit and which are fillers.

The double-blind recommendation is primarily focused on keeping knowledge about the suspect from the administrator of a lineup so that this knowledge cannot influence the administrator's behavior while conducting the identification procedure. However, the purpose of the recommendation is to keep anyone who knows which lineup member is the suspect from influencing the witness. Thus, there should be no officers (e.g., the lead detective) in the room where the identification procedure is conducted who know which lineup member is the suspect, even if they are not the officer administering the procedure. Moreover, if there are multiple witnesses, a different blind administrator should conduct the lineup with each witness because conducting a procedure with one witness may provide an administrator with clues about which lineup member is the suspect, which might then influence how that administrator interacts with the next witness while administering the identification procedure (Douglass, Smith, & Fraser-Thill, 2005).

It is equally important to keep information about which person is the suspect and which ones are fillers from the witness. It might seem odd to explicitly warn against letting a witness know who the suspect is before they make an identification decision. In practice, however, we find it not uncommon for circumstances surrounding the identification procedure to alert the witness to which lineup member is the suspect. For example, the witness may be tipped off to who the suspect is after being presented with multiple photo arrays that share only one lineup member (the suspect) in common, which is one of the many reasons for our recommendation to avoid repeated lineup procedures (Recommendation 8).

The recommendation for double-blind administration of lineups was included among the original four recommendations made in the previous scientific review paper (Wells et al., 1998). At the time that article was written, however, there were no studies that directly tested whether a lineup administrator's knowledge of which lineup member was the suspect influenced witness identifications. Without studies directly testing the effects of double-blind administration of lineups, the recommendation was made based on generalizations from basic studies on experimenter expectancy effects (Harris & Rosenthal, 1985) and early research suggesting that positive feedback to witnesses after they choose the suspect increases their confidence in that choice (Wells & Bradfield, 1998). Since the previous scientific review paper was written, researchers have conducted a number of studies demonstrating that the single-blind administration of lineups increases the likelihood that witnesses will identify the suspect (for a review, see Kovera & Evelo, 2017), irrespective of whether the suspect is the culprit (Charman & Quiroz, 2016; Greathouse & Kovera, 2009) or an innocent suspect (Charman & Quiroz, 2016; Greathouse & Kovera, 2009; Zimmerman, Chorn, Rhead, Evelo, & Kovera, 2017).

Paradigms for Examining Lineup Administrator Influence

Scholars have developed several paradigms to examine the effects of administrator influence on witness decisions. In one paradigm, which has been termed the *steering paradigm* (Kovera & Evelo, 2017), the lineup administrator is a confederate

of the experimenter who intentionally engages in behaviors that steer that witness toward the suspect (e.g., Rhead, Rodriguez, Korobeynikov, Yip, & Kovera, 2015) or encourages the witness to make an identification (Clark, Brower, Rosenthal, Hicks, & Moreland, 2013). However, the influence of administrators on witnesses need not be intentional. In the *cue-disruption paradigm*, all administrators know who the suspect is but half of them are prevented from sending cues (whether intentionally or unintentionally) to the witness during the administration of the lineup. In one study, for example, the contact between the administrator and the witness was limited by having the administrators stand behind the witnesses while they viewed a photo-array. Witnesses were less likely to identify the suspect when the administrator stood behind them than when the administrator sat in front of or beside the witness (Haw & Fisher, 2004). In the *double-blind paradigm*, participants are randomly assigned to be either witnesses or lineup administrators; half of the lineup administrators are told who the suspect is and the other half are not (Phillips, McAuliff, Kovera, & Cutler, 1999). These participant administrators then present the photo-array to the participant witnesses. Across all paradigms, when administrators know who the suspect is and are not prevented from sending cues to the witness, witnesses are more likely to choose the suspect from the lineup, whether the suspect is the culprit or not (Kovera & Evelo, 2017).

These studies tell us that changes in the behavior of administrators during the administration of the lineup are responsible for this increase in witness picks of the suspect. In the steering paradigm studies, the administrators' behaviors were intentionally manipulated to steer the witness toward the suspect and away from fillers (e.g., Rhead et al., 2015). In double-blind paradigm studies, observers reported that nonblind administrators placed more pressure on witnesses to choose someone from the lineup than did blind administrators (Greathouse & Kovera, 2009) and that pressure was directed toward choosing the suspect rather than a filler (Zimmerman et al., 2017). Nonblind administrators were more likely to directly ask witnesses about the suspect than were blind administrators (Zimmerman et al., 2017). Nonblind administrator influence can be nonverbal as well; nonblind administrators are also more likely than blind administrators to smile when a witness is looking at the suspect rather than a filler (Charman & Quiroz, 2016; Zimmerman et al., 2017).

These differences in behaviors between blind and nonblind administrators affect which photo witnesses choose from lineups, not whether they make a choice at all. Witnesses are equally likely to choose someone from a lineup, irrespective of whether the lineup administrator knows who the suspect is (Greathouse & Kovera, 2009; Kovera & Evelo, 2017). The increase in witness identifications of the suspect from single-blind lineup administrations appears to be the result of witnesses who would have identified a filler (and do so under blind administration) identifying the suspect instead due to influence from the nonblind administrator (Kovera & Evelo, 2017). This pattern of findings, replicated in a number of studies (Charman & Quiroz, 2016; Greathouse & Kovera, 2009; Kovera & Evelo, 2017), is known as the filler-to-suspect shift and provides compelling evidence that single-blind lineup administration allows administrators to transmit information about who the suspect is to witnesses, even if unintentionally.

Double-Blind Administration Helps Prevent Postidentification Feedback

In addition to affecting witnesses' identification decisions, single-blind lineup administration allows administrators to provide feedback to witnesses about their decisions. Nonblind administrators react to witness identifications in ways that send information to witnesses about whether their choice was "correct" (i.e., an identification of the suspect; Charman & Quiroz, 2016; Garrioch & Brimacombe, 2001). Two decades of research supports the conclusion that providing feedback to witnesses that they identified the suspect increases their confidence in the accuracy of their decision, especially among eyewitnesses who have made a mistaken identification (Stebly, Wells, & Douglass, 2014; see Recommendation 6 for a more complete discussion of this research). This confirming feedback effect attenuates the relationship between confidence and accuracy (Bradfield, Wells, & Olson, 2002), rendering witnesses' reports of their confidence useless for judging their accuracy (Wixted & Wells, 2017). In addition to preventing administrators from providing feedback that will influence witnesses' reports of their confidence, double-blind administration will also prevent other unwelcome effects of feedback such as the contamination of witnesses' memory for the conditions under which they witnessed the crime (Stebly et al., 2014), the impairment of witness memory for the culprit (Smalarz & Wells, 2014a), and lessening the ability of jurors to differentiate between accurate and inaccurate witnesses (Smalarz & Wells, 2014b).

Double-Blind Administration Helps Ensure Full and Accurate Reports

Knowing who the suspect is may also influence what information administrators record about witnesses' behavior during the identification procedure. Even though we recommend video-recording the lineup administration (see Recommendation 7), a 2013 survey indicated that most lineups in the U.S. (>75%) are not video-recorded (Police Executive Research Forum, 2013). In cases that fail to video-record, the only contemporaneous record of what happened during the procedure is information memorialized by the administrator. Lineup administrators often fail to make a record of the verbatim statement of the eyewitness but instead will make a note of the gist of what the eyewitness said. It is also possible that knowing who the suspect is may change how administrators assess and record witnesses' choices from lineups. If so, when witnesses make tentative identifications (e.g., "I don't know. I think it may be Number 4, but I'm not certain."), administrators who know that the witness is talking about a suspect may record a positive identification of the suspect whereas administrators who know that the witness is talking about a filler may record the very same behavior as a nonidentification or rejection (Rodriguez & Berry, 2014). Moreover, lineup administrators' interpretations of ambiguous eyewitness statements and administrators' perceptions of the witness are biased by whether the lineup administrator is blind or not blind (Charman, Matuku, & Mook, 2019).

Although there are limited empirical data that directly bear on the effects of administrators' knowledge of who the suspect is on their reports, evidence continues to mount that forensic examiners' expectancies influence their evaluations (for a review, see Kassir, Dror, & Kukucka, 2013). In addition, there are data from both

laboratory and field studies suggesting that administrators who are nonblind record witness choices differently than do administrators who are blind. Indeed, for 5 years in Queens County, NY, the District Attorneys' Office recorded choices made by witnesses from live single-blind lineups. Supposedly, choices were only recorded when the administrators judged that it had been made with a high degree of confidence and was not tentative (as reported in [Mecklenburg, 2006](#)). But in these Queens County cases, it was nonblind administrators who made decisions as to whether to report an affirmative response as an identification or whether to dismiss it as something else. In other words, the administrators in the Queens County cases knew that these were filler picks. This procedure resulted in a very low rate of *reported* filler identifications (between 0.56% and 5.62%). Field studies for which the lineups were conducted double-blind, however, report filler identification rates that are much higher 11%–15% (see [Klobuchar, Steblay, & Caligiuri, 2006](#); [Wells, Steblay, & Dysart, 2015](#)). This difference in filler identification rates could represent a difference in reporting that derives from whether the lineup was double-blind.

In other field data from the Evanston Police Department in Illinois, reports from double-blind lineups were more likely to involve verbatim reports of witness statements than were reports from single-blind lineups (83% vs. 39%, [Steblay, 2011](#)). The interpretation of the Evanston data is problematic because only double-blind administrators were instructed to record what words the witnesses used to make their identification whereas single-blind administrators were not.

Controlled experiments have tested how administrators make records of the behavior of eyewitnesses as a function of whether the administrator of a lineup was blind and whether a confederate-witness chose the suspect or a filler ([Rodriguez & Berry, 2014, 2019](#)). Although double-blind administrators were just as likely to report that witnesses had made a positive identification when the witness identified a filler as when the witness identified the suspect, single-blind administrators were more likely to report incorrectly that witnesses who identified a filler had not made an identification. Moreover, when nonblind administrators recorded the confidence reported by witnesses, independent coders who were blind to condition judged the confidence levels of those who identified suspects to be higher than those who identified fillers even though the confederate-witness expressed the same level of confidence in both types of identifications ([Rodriguez & Berry, 2019](#)).

These effects of single-blind lineup administration on witnesses' identification decisions, their confidence, and administrators' reporting behavior support the use of double-blind procedures when collecting eyewitness identification evidence. The [U.S. Department of Justice \(2017\)](#) and the [National Research Council \(2014\)](#) have made similar recommendations. Nevertheless, many jurisdictions have yet to put this procedure, or a similar alternative, into practice ([Kovera & Evelo, 2017](#)).

Practical Issues in Implementing Double-Blind Lineups

Some resistance to double-blind lineup administration has come from a limited-resources argument that certain police departments are so small that every officer in the department knows the identity

of the suspect. At the state level, this concern has not been found in actual practice. In 2002, New Jersey became the first state to mandate double-blind administration, and state officials have reported no problems implementing this policy. In cases of very small police departments, for example, cooperative agreements were created to loan officers to nearby departments for the purpose of conducting double-blind identification procedures. Other states, from Florida to California, have similarly reported no problems with conducting double-blind lineups.

Hence, we recommend double-blind lineup administration and believe that actual practice has proven it to be viable for all jurisdictions. Nevertheless, in theory any procedure that prevents the possibility of a nonblind lineup administrator influencing the eyewitness could be used. With photo lineups for example, it is possible to use a laptop computer with software that delivers prelineup instructions, randomizes and presents the photo lineup, records any identification decision from mouse clicks, and collects a confidence statement from the eyewitness. With such software, the eyewitness can self-administer the photo lineup without anyone else present in the room, thereby guaranteeing that there could not have been lineup administrator influence over the eyewitnesses' identification or confidence statements. We recommend that video-recording be used with the laptop procedure just as it is with a double-blind administrator (see Recommendation 7).

A low-tech alternative to the self-administered laptop procedure for photo lineups is the self-administered envelope method. With the envelope method, a photo lineup is prepared with clearly numbered photos and the page should clearly state the options (to identify one of the photos, indicate "not there," or indicate do not know in a way that is parallel to the instructions in Recommendation 5). The page should also include a confidence question (see Recommendation 6). A photo lineup with these items should be placed in a large envelope and sealed. After giving complete instructions to the eyewitness (see Recommendation 5), the lineup administrator should tell the eyewitness that the photos are inside of the envelope. Of course, when using the self-administered envelope method as an alternative to the double-blind method, the instruction that the lineup administrator does not know which lineup member is the suspect cannot be used. The witness should be instructed to make an identification decision by either circling the photo of the person they believe to be the culprit or circling the "none" or "do not know" option below the photos. The witness should be instructed to place the photo-lineup and responses back in the envelope before opening the door to tell the lineup administrator that she or he has finished. The witness should not be handed the envelope until the lineup administrator is prepared to leave the room. The outside of the envelope should again tell the eyewitness to open the envelope and to view the photos only after the officer has left the room and to replace the photos and the answers to questions back in the envelope before opening the door to let the officer know that they are finished. Only when the witness has confirmed that the identification decision and confidence statement have been completed and placed back in the envelope should the officer reenter the room and examine the results.

This envelope method could be adapted for sequential presentation of the photos, with photos placed individually in smaller, numbered envelopes and instructions to look at each photo in numerical order and record an identification decision and a con-

confidence judgment before replacing the photo in its envelope and proceeding to the next envelope. Backloading of the lineup could be achieved by placing additional envelopes with blank photo pages in the later numbered envelopes, with an instruction in the first envelope used for backloading that the lineup procedure is complete and witnesses should return all materials to the large envelope and let the administrator know that they are done. As with all identification procedures, the self-administered envelope procedure should be video-recorded to ensure that the witness follows the instructions given.

In addition to concerns about limited resources making it difficult to implement double-blind procedures, some have objected to their adoption because of the loss of correct identifications associated with double-blind administration (Clark, 2012a, 2012b). Although it is true that double-blind procedures can reduce both correct and mistaken identifications, they do so by eliminating the opportunity for administrators to cue the witness to which lineup member is the suspect. Given that the legal system requires that an eyewitness identification be based on the independent memory of the witness (*Perry v. New Hampshire*, 2012), the loss of an identification obtained through administrator influence should not be a concern. Indeed, some scholars have termed these correct identifications obtained through suggestive procedures to be “illegitimate hits” (i.e., correct identifications that are not based in the witness’s memory but instead a product of the cues received from an administrator; Wells et al., 2012). Thus, double-blind procedures serve to protect suspects’ rights to due process.

Recommendation 4: Lineup Fillers

There should be only one suspect per lineup, and the lineup should contain at least five appropriate fillers who do not make the suspect stand out in the lineup based upon physical appearances or other contextual factors such as clothing or background.

Recommendation 4 concerns what might be considered the most widely known problem that can afflict lineups, namely a lineup that is constructed in a way that makes it obvious which member is the suspect. This idea is the source of scores of cartoons and jokes about the perceived failings of criminal justice, such as one that depicts a person embedded in a lineup composed of a dog, cat, refrigerator, and a microwave oven. Nevertheless, jocular treatments of biased lineups hide a serious problem and this problem has much greater complexity than meets the eye.

The problem of biased lineups is one of the oldest in the scientific study of eyewitness identification. In fact, the first published experiment on eyewitness identification that manipulated the presence versus absence of the culprit in the lineup (a now routine feature of eyewitness identification experiments) was an experiment in which the researchers also manipulated the lineup fillers to be either similar or dissimilar to the suspect (Lindsay & Wells, 1980). Not surprisingly, in culprit-absent lineup conditions the use of high-similarity lineup fillers strongly reduced mistaken identifications of the innocent suspect compared with the use of low-similarity fillers. In culprit-present conditions, the use of these same high-similarity fillers had only a minor impact on accurate identifications of the culprit relative to the use of low-similarity fillers. This pattern of results, showing that using low-similarity fillers increases the chances of mistaken identification of an inno-

cent suspect, has been repeatedly replicated (Fitzgerald, Price, Oriet, & Charman, 2013).

Despite the relative ease of replicating the basic finding that low-similarity fillers increase the risk of mistaken identification of an innocent suspect, there is not total agreement among eyewitness scientists regarding the best strategy for choosing fillers to serve in a lineup. There are two primary strategies for selecting fillers (Luus & Wells, 1991). One strategy uses the verbal description of the culprit that the eyewitness provided (e.g., “White male, mid-20s in age, about 5 feet 10 inches tall, short dark hair, no facial hair, medium build”). This method of selecting fillers is called the *match-to-description strategy*. The alternative strategy, called the *resemble-suspect strategy*, involves selecting fillers who physically resemble the suspect. The resemble-suspect strategy can be problematic because it has no criterion or “stopping point” for determining how similar the fillers should be, at times resulting in lineup fillers who are too similar and leading to a different problem than a biased lineup (Luus & Wells, 1991). In effect, extremely high similarity creates a lineup of near-clones, thereby making it too difficult to identify the culprit from a culprit-present lineup. The match-to-description strategy, in contrast, has a natural stopping point (the description) and does not risk creating such high levels of similarity between fillers and the suspect that would interfere with obtaining accurate identifications of the culprit (Luus & Wells, 1991). An experiment comparing the two strategies to a biased (low similarity) lineup showed the two strategies to be equally effective in reducing innocent suspect identifications; however, the resemble-suspect strategy produced a reduction in accurate identifications of the culprit, whereas the match-to-description strategy did not (Wells, Rydell, & Seelau, 1993). These findings have been replicated (Juslin, Olsson, & Winman, 1996). Other studies have shown either no detrimental effect on culprit identifications from using the resemble-suspect strategy and no evidence that it made the innocent suspect stand out (Tunnicliff & Clark, 2000), or no advantage one way or the other for match-to-description versus suspect resemblance strategies (Darling, Valentine, & Memon, 2008). But a large-scale study comparing description-matched fillers to suspect-matched fillers showed clear evidence favoring description-matched fillers (Carlson et al., 2019).

In a meta-analysis of the data on filler similarity, lineups classified as high similarity produced a reduction in culprit identifications relative to low similarity lineups but not relative to moderate similarity lineups (Fitzgerald et al., 2013). As noted in the meta-analysis, the categorization of low, medium, and high similarity lineups reflected relative rather than absolute levels of similarity (the concept of similarity could not be defined in absolute terms, with clear criteria for each level of sameness). In a more recent study, fillers who resembled the suspect were selected from either an extremely large database of faces (which produced very high similarity fillers) or a more modest sized database (which produced more moderate levels of similarity; Bergold & Heaton, 2018). Compared with the more modest size database of faces, using the large database of faces for selecting fillers resulted in a reduction in accurate identifications of the culprit by producing too much similarity between the fillers and the suspect. Overall, the data suggest that using the resemble-suspect strategy could produce too much similarity between the suspect and the fillers such that it interferes with identifications of the culprit, especially when

fillers are selected from large databases. This problematic condition could become more prevalent as the ability to rapidly search large databases of faces becomes increasingly more common.

A Blended Approach for Choosing Fillers

The net result of these complex problems is that the science has not yet been able to specify what the optimal level of similarity of fillers to the suspect ought to be and thus, at this time, there is no single strategy or formula for selecting fillers to be used in a lineup. Nevertheless, there are generally accepted principles regarding how fillers should be selected for a lineup, and they tend to involve a blend of the match-to-description and resemble-suspect strategies. First, there is general agreement among experts for a *minimal* requirement that fillers should fit the description that the eyewitness gave of the culprit. A failure to match the witness's description might introduce a serious bias even though lineup members may look very similar. For example, a witness might describe the culprit as "male, 40s, shaven head, striking blue eyes, very solid build around the neck and shoulders." A subsequent lineup could have an array of people who are very similar in appearance; however, if only one of the lineup members had blue eyes, that individual becomes distinct within the array in that his face will match the memory of the perpetrator more so than will the fillers.

An exception to this general match-to-description principle should be made when the suspect does not fit the witness's description. For example, a person might become a suspect for reasons other than his or her appearance. Furthermore, if the description of the culprit mentioned a moustache, but the suspect does not have a moustache, then the fillers also should not have a moustache. In other words, if there is a discrepancy on some physical feature between the eyewitness's description of the culprit and the appearance of the suspect, the fillers should match the suspect's appearance (rather than the witness's description of the culprit) on that feature.

Another situation in which match-to-description is inadequate is when the description is vague, general, or sparse. For example, the description "young White male" is inadequate. In this case, the fillers should match the suspect on basic "default" characteristics such as facial hair, hairstyle, and general body build (Lindsay, Martin, & Webber, 1994). Hence, the match-to-description method for selecting fillers should be used only if the description is complete.

Sometimes a suspect has a unique feature such as a tattoo or a scar, making it very difficult to find a filler who matches on that unique feature. There are two general approaches to dealing with this issue, made easier by advances in technology. One approach is to duplicate this feature on the fillers, which could be done electronically in the case of photo lineups. The other approach is to cover the unique feature on the suspect and then place that same cover on each of the fillers at the same location on their bodies. Both the "duplicate" and "cover" approaches appear to be equally effective (Colloff, Wade, & Strange, 2016). However, these alterations must be done in a way that does not make the suspect stand out in a mock witness test (see next section).

Another complication in selecting fillers can occur when a person becomes a suspect based on resemblance to a facial composite (e.g., forensic sketch or computer-generated face) or a

surveillance image (although see discussion of the problems associated with using culprit-match to a composite in Recommendation 2: The Evidence-Based Suspicion Recommendation). If the person became a suspect based on resemblance to a composite or to a surveillance image whereas the fillers were chosen based merely on their match to the witness's verbal description, then there is a risk that the suspect will stand out. Hence, in such cases, fillers for a lineup need to be chosen based on their similarity to that same composite or surveillance image rather than chosen based on the verbal description given by the eyewitness (see Wixted & Wells, 2017).

"Mock Witness" Testing

There is broad agreement that the lineup that is created should be able to pass a "mock witness" test. A mock witness test is one in which a large number of people are individually given the description that the witness had given of the culprit, then shown the lineup and asked which person they think is the suspect. The ideal outcome from such a test would be if the suspect were selected by these mock witnesses only $1/N$ th of the time, where N is the nominal number of lineup members. So, for a six-person lineup, a good outcome would be if the suspect were picked one sixth of the time. Consider again the witness description "male, 40s, shaven head, striking blue eyes, very solid build around neck and shoulders" and the suspect is the only one with blue eyes. This lineup is likely to result in most mock witnesses choosing the suspect rather than spreading their choices across the lineup members. We are *not* suggesting that police should be required to conduct a mock witness test on each lineup they create. Instead, we believe that a conscientious and objective detective would have a good sense of whether the lineup was fair without conducting a mock witness test with a large number of people. However, we do recommend that a nonblind officer building the lineup ask at least one or two other people (blind as to which person is the suspect) to review the witness description and evaluate the lineup with respect to whether it would pass a mock witness test. We also recommend that every lineup report include a written record of how the fillers were selected for the lineup.

Mock witness tests have been around since the 1970s (Doob & Kirshenbaum, 1973) and a number of different statistics have been developed to estimate lineup bias from mock witness results (e.g., Malpass, 1981; Tredoux, 1998; Wells, Leippe, & Ostrom, 1979). Mock witness measures tend to predict choices of eyewitnesses from culprit-absent lineups (Tredoux, Parker, & Nunez, 2007), though mock witness tests do have limits (see Wells & Bradfield, 1999). One of these limits is that a mock witness test is insensitive to whether the level of similarity between fillers and the suspect is too high, so high that it would likely harm rates of accurate identifications if the suspect is the actual culprit. For example, a lineup of clones would produce a good result from a mock witness test (one sixth of choices are of the suspect), even though it would not be a good lineup in that most witnesses would not be able to distinguish between the culprit and the fillers. In addition, because mock witness tests use the description of the culprit provided by the eyewitness, a mock witness test can appear perfectly fair if the description is sparse whereas that same lineup can appear quite unfair if the description is detailed (Mansour, Beaudry, Kalmet, Bertrand, & Lindsay, 2017).

Background, Clothing, and Other Contextual Factors

The physical characteristics of the fillers are not the only factors that can make the suspect stand out in a lineup. In photo lineups, for example, the background of the photos, the size or brightness of the images, and the source of the photo could make the suspect's photo stand out from the others. Backgrounds are relatively easy to fix on photos with modern editing software. Similarly, clothing can easily be eliminated from headshots with editing software. Sometimes, a suspect's photo is from a different source (e.g., employment ID, social media, Department of Motor Vehicles driver's license) than a police department's usual source for photo lineups (e.g., mugshots), and this can make the suspect's photo stand out. This type of discrepancy will require either careful electronic editing or perhaps going to the same source (e.g., Department of Motor Vehicles drivers' licenses) to locate appropriate fillers.

It is not the case that every aspect of background, clothing, and other features must be exactly the same. The critical issue is whether the suspect stands-out in the context of the other fillers. So, for example, if the background of every photo was different from every other photo in the lineup, then perhaps the suspect's photo would not be any more distinct than other lineup members.

Articles of clothing (e.g., hats, shirts, etc.), however, could be of special concern. Specifically, if there are reasons to believe that the clothing worn by the suspect is similar to that worn by the culprit, then (a) every filler needs to be clothed that same way, (b) the suspect needs to have his or her clothes changed to blend in with the fillers, or (c) each lineup member's clothing must be obscured from the view of the witness. For cases in which the identification of clothing is thought to have potential probative value, a separate identification procedure involving *only* the papers of clothing (a clothing lineup) could be conducted independently of the identification of the suspect (see Lindsay et al., 1994; Lindsay, Wallbridge, & Drennan, 1987).

The Single-Suspect and Minimum of Five Fillers Requirement

A central feature of this recommendation is that the lineup should have only one suspect. There are several reasons why there should be only one suspected person in the lineup with the remainder having the status of being known-innocent fillers. Suppose, for example, that a lineup were composed entirely of suspects and no fillers. All-suspect lineups have been likened to a multiple-choice test in which there is no wrong answer (Wells & Turtle, 1986; Wixted & Wells, 2017). The value of having known-innocent fillers is that unreliable eyewitnesses are likely to err on a filler rather than on an innocent suspect (assuming that the lineup is composed of good fillers).

Consider again Table 1 of the current article in which we displayed the outcomes of lineups in actual cases. These were all single suspect lineups in which the suspect was embedded among fillers. Notice that these eyewitnesses to serious crimes identified fillers approximately 37% of the time they made an identification. If everyone in those lineups had been a suspect, all 37% of these would be mistaken identifications of innocent suspects who would then be subject to arrest and possible prosecution. These field data reinforce the dangers of having multiple suspects in a lineup, an

issue that was first documented over 30 years ago through statistical proofs using data from eyewitness identification experiments (Wells & Turtle, 1986).

The recommendation that there should be at least five known-innocent fillers (thereby creating a six-person lineup) for a single suspect is somewhat arbitrary. At a theoretical level, we can say that an innocent suspect is better protected from mistaken identification with a six-person lineup than a five-person lineup, which is better protection than a four-person lineup, and so on, as long as other things are equal (e.g., how good the fillers are). However, there are diminishing returns (in terms of restricting mistaken identifications of innocent suspects). After all, in terms of protecting an innocent suspect, an increase from two fillers to three fillers is greater than an increase from five to six, which in turn will have more impact than an increase from seven to eight fillers.

Some jurisdictions in the U.S. use more than six. Some jurisdictions in Australia use lineups that vary from eight to 10 members, and England and Wales also use more than six members. Of course, as noted in the previous discussion on selecting fillers for lineups, it is not the nominal size of the lineup that matters so much as the number of lineup members who fit the description of the culprit. A lineup of 12 people would be less effective than a lineup of six people if the 11 fillers in the 12-person lineup did not fit the description of the suspect, whereas the five fillers in the six-person lineup did fit the description. Of course, a 12-person lineup in which all fillers were a good match to the suspect would provide more protection for the innocent suspect than would a six-person lineup in which all the fillers were good fillers. Although one eyewitness identification researcher has argued strongly for large increases in photo lineup sizes to as high as 120 (Levi, 2011), at this point we are not convinced that large increases in lineup size are warranted in practice. Among other things, all but one of the lineup members must be a priori cleared as possible suspects so that they can have the definitive status of known-innocent fillers. Establishing the innocence of a large number of fillers is not an issue in a lab experiment, but it would be in actual practice. As lineup size increases, it is also increasingly difficult to locate fillers who properly fit the description of the culprit. Adding extremely poor fillers to a lineup can enhance eyewitnesses' confidence in a mistaken identification (Charman, Wells, & Joy, 2011). In addition, there are concerns about potential loss of correct identifications (of the culprit) if a lineup becomes too large.

A Theoretical Note About Lineup Fillers

There is currently debate in the eyewitness identification literature about how good lineup fillers manage to improve overall lineup performance (i.e., how do they reduce mistaken identifications of innocent suspects more than they interfere with identifications of the culprit?). Some have suggested that the use of good fillers helps witnesses decide which facial features are diagnostic (e.g., Colloff et al., 2016; Wixted & Mickes, 2014), whereas others have argued that good fillers simply siphon false positive identifications away from the innocent suspect more than they siphon from the culprit (e.g., Smith et al., 2017; Smith, Wells, Smalarz, & Lampinen, 2018; Wells, Smith, & Smalarz, 2015). It is possible that both of these processes are involved and these might not be the only two possibilities. Regardless of which processes underlie the contribution that good fillers make to improved witness accuracy,

the answer to this theoretical question ultimately could help to clarify the best strategies for choosing fillers for lineups, and should be considered in future research.

With photo lineups, care should be taken not only with respect to the choice of filler photos but also the photo of the suspect. Often, there are multiple possible photos of the suspect to choose from. When possible, the suspect's photo should be clear and look as much as possible like the suspect appeared at the time of the crime. If the crime was recent, for example, older photos of the suspect should not be used if a more recent photo is available.

Recommendation 5: Prelineup Instructions

When inviting an eyewitness to attend a lineup procedure (photo lineup or live lineup), police should not inform the eyewitness of any information that the witness has not already provided and certainly should not suggest that the suspect who will be in the lineup has been arrested or that the culprit will be present in the identification procedure. The eyewitness should be instructed that (a) the lineup administrator does not know which person is the suspect and which persons are fillers; (b) the culprit might not be in the lineup at all, so the correct answer might be "not present" or "none of these"; (c) if they feel unable to make a decision they have the option of responding "don't know"; (d) after making a decision they will be asked to state how confident they are in that decision; and (e) the investigation will continue even if no identification is made.

This recommendation addresses the concern that, if witnesses approach the identification test with the mistaken belief that the culprit must be present in the lineup, they may be predisposed toward making a positive identification. Intuition would suggest that many witnesses are likely to presume—based on the invitation to view a lineup—that the police must have a strong suspect and, thus, their task is to determine which lineup member the suspect is. There are various strands of evidence suggesting that witnesses make this assumption. For example, in one study, 90% of a large sample of witnesses indicated immediately after making their identification decision that they had expected the culprit to be present in the lineup and believed their task was to identify him or her (Memon, Gabbert, & Hope, 2004). In another study, witnesses either viewed a lineup containing the culprit or a lineup with the culprit removed but not replaced by another filler (Wells, 1993). In the former condition, 54% of witnesses picked the culprit, 25% picked one of the fillers, and 21% made no choice. When the culprit was removed but not replaced, it might be expected that around 75% of witnesses (i.e., 54% + 21%) would make no choice. Instead, only 32% of witnesses made no choice, with 68% distributing their choices across the various fillers. This finding suggests that witnesses are predisposed toward making a positive identification, though not necessarily with high confidence, provided some lineup member appears to be a reasonable match to their memory.

The most compelling evidence of the usefulness of this recommended instruction comes from studies comparing the identification performance obtained when witnesses are instructed that the culprit *might* or *might not be present* in the lineup to identification performance obtained under conditions where no such warning is provided. The former condition has typically been referred to as an unbiased instructions condition, the latter as a biased instructions

condition. The way in which these two conditions have been enacted has varied. For example, unbiased instructions have often simply involved providing *the culprit might or might not be present* warning, although sometimes this has been accompanied by an instruction that there is no need to pick anyone or even an instruction emphasizing that the consequences of a wrong decision may be dire. Biased instructions may also take many forms, such as failing to forewarn the witness that the culprit might not be in the lineup or by strongly implying or even stating that the culprit is in the lineup. For example, asking the witness to select which lineup member is the culprit strongly implies that the witness is expected to make a positive identification decision.

Several features of the empirical findings on the effects of biased versus unbiased instructions warrant mention. First, the findings of three major reviews using meta-analytic procedures demonstrate that witnesses were more likely to make a positive identification decision when the lineup instructions were biased (i.e., no warning regarding possible absence of the culprit) than when they were unbiased (Clark, 2005; Steblay, 1997, 2013). Second, although the magnitude of this effect varied across the reviewed studies, presumably depending on the conditions at memory encoding and the identification test, the increased likelihood of choosing was reflected in increased positive identifications from both culprit-absent and culprit-present lineups. Thus, it had both positive and negative effects. Third, subsequent to the publication of these reviews, findings from two studies with very large sample sizes have reinforced the impact of biased versus unbiased instructions with both adult and child witnesses (Brewer & Wells, 2006; Keast, Brewer, & Wells, 2007). Biased instructions contributed to higher rates of both mistaken identifications and correct identifications, suggesting that a failure to warn witnesses that the culprit may not be present in the lineup contributes to witnesses being prepared to accept less evidence (i.e., establishing a more liberal decision criterion) for making a positive identification decision. This lower threshold for choosing could be beneficial if the base rate of guilty suspects were high, but it would be detrimental if the base rate of guilty suspects were low, as may often be true of real police lineups (e.g., Wixted et al., 2016).

The precise impact of witnesses lowering their decision criterion will also depend on factors such as the characteristics of the various lineup members (Brewer, Weber, & Semmler, 2005). For example, if the lineup is biased against the suspect by virtue of the suspect being the only plausible lineup member, a lower decision threshold would increase the likelihood of (a) a correct identification if the suspect is the culprit and (b) a mistaken identification of an innocent suspect if the suspect is innocent. In contrast, if the suspect is presented in an array of highly plausible fillers, instructions that lead witnesses to set a lower decision threshold may lead to responses being spread more evenly across all lineup members.

It is important to note one qualification of the pattern of findings typically found when contrasting the impact of unbiased versus biased instructions. The effect of unbiased instructions may be negated if the witness receives an explicit suggestion prior to viewing the lineup that the culprit may be present in the lineup. In a study in which witnesses were presented with culprit-absent lineups only, witnesses received the suggestion *surely you are going to be able to pick the person out from the lineup* prior to receiving the instruction that the culprit may or may not be present in the lineup (Quinlivan et al., 2012). Witnesses who received that

suggestion, followed by unbiased instructions, were three times more likely to identify the suspect (who, in this study, was innocent) than were witnesses who received unbiased instructions without any prior suggestive comment. Witnesses in the former condition were also more confident in the accuracy of their erroneous identification decision than those in the latter condition.

The research findings on instructing witnesses prior to their viewing a lineup have clear implications. First, when inviting an eyewitness to attend a lineup procedure, police should not suggest that a suspect has been arrested or that the culprit will be present in the identification procedure. Second, in our experience some witnesses seem to be under the misconception that the investigation hinges on their identification decision. Consequently, witnesses should also be told that the investigation will continue even if no identification is made.

Third, it should be made quite clear to the witness that the culprit may or may not be in the lineup and that they do not have to select any of the lineup members. In other words, responses such as *not present* or *none of these* are quite appropriate. A reminder that the witness does not have to choose anyone from the lineup is important. A large percentage of witnesses are under the impression that the culprit is present and their task is to identify him (Memon et al., 2004). Fourth, to ensure that the witness does not lose sight of the fact that such response options are appropriate, there should be an explicit *not present* response option accompanying the lineup members from which the eyewitness can choose. In the case of a photo lineup, this option may be located below the array of lineup faces. In the case of a live lineup, a response sheet that shows the possible response options can be used: lineup member numbers (i.e., 1, 2, . . . , 6), not present, and do not know.

Finally, lineup administration procedures should accommodate the possibility that the witness may look at the lineup and be unwilling to pick someone or to respond not present because, for example, they cannot decide between two or more lineup members or they are uncertain about whether the culprit is in the lineup. For that witness (i.e., one who really has no idea about what to do), an appropriate response may be to say “don’t know” rather than not present. Both adult and child witnesses use options such as do not know or not sure when they are made explicitly available, with frequency of use varying considerably depending on the encoding stimuli and lineup materials (Brewer, Keast, & Sauer, 2010; Weber & Perfect, 2012; Zajac & Karageorge, 2009). Moreover, there is some evidence indicating that positive identifications of a suspect are more diagnostic of suspect guilt when they are made in the presence of a do not know option compared with when no such option existed (Weber & Perfect, 2012).

The availability of an option to respond do not know is likely to reduce the likelihood of low confidence positive identifications, which research shows are often inaccurate (Brewer & Wells, 2006; Wixted & Wells, 2017). Although there are strong grounds for always questioning the reliability of low confidence identifications, there may be a tendency on the part of police or prosecutors to argue, for example, that the initial low confidence identification was made from a photo that was not a good likeness to the suspect, thereby purportedly providing a reasonable explanation for the witness’s low confidence. Further, although studies have shown that mock-jurors (appropriately) downgrade the credibility of the witness and the culpability of the defendant when cross-examination highlights a disparity between a witness’s expressed

confidence at initial identification (low confidence) versus an in-court identification (high confidence; Bradfield & McQuiston, 2004; Jones, Williams, & Brewer, 2008), this effect does not always occur (e.g., Douglass & Jones, 2013). For example, if a witness expressed high confidence in their identification of the suspect during a trial despite a low confidence initial identification, jurors tended to excuse the confidence inflation if the witness appeared to have experienced an epiphany about their initial low confidence identification (e.g., “I wasn’t very confident at the time of the identification because I was scared back then”). As long as these types of excuses for initial low-confidence identifications are permitted, we argue that it is crucial that there is an explicit do not know response option, which can be located alongside the not present option.

We note that some jurisdictions have used what has been referred to as an “appearance change” instruction. This instruction was among a set of guidelines developed by a U.S. Department of Justice (DoJ) working group on the collection of eyewitness evidence. Specifically, the DoJ guidelines recommended that, prior to being shown a lineup, eyewitnesses should be told that “individuals depicted in lineup photos may not appear exactly as they did on the date of the incident because features such as head and facial hair are subject to change” (Technical Working Group for Eyewitness Evidence, 1999, p. 32). We have not included this instruction in the current set of recommendations because subsequent research has shown that the appearance change instruction increased false identifications but did not increase culprit identifications (Charman & Wells, 2007; Molinaro, Arndorfer, & Charman, 2013).

As a final note on instructions, we recommend that in addition to the witness having the instructions in writing, the lineup administrator should read the instructions aloud to witnesses, pausing after each point to make sure that the witness understands each point.

Recommendation 6: Obtain an Immediate Confidence Statement

A confidence statement should be taken from witnesses as soon as an identification decision (either positive or negative) is made.

For double-blind lineups, “immediate” means that the confidence statement should be secured with only the blind administrator in the room and before the case detective or any other nonblind individuals are allowed into the room. Note that a confidence statement should be recorded if a witness positively identifies someone or if a witness indicates the culprit is *not present*, says they *do not know*, or indicates that they are *not sure*. As an example, the confidence statement could be collected as a numeric response (i.e., on a scale from 0% confident to 100% confident). Alternatively, confidence could be collected using a verbal scale (e.g., “positive,” “probably,” “maybe”). If neither scale is used and witnesses simply use their own words, a verbatim record of their verbal statements (or preferably a video-recording, see Recommendation 7) should be made, not a summary or paraphrase generated by the lineup administrator. If the witness’s response is “don’t know,” a confidence statement should be recorded if the witness spontaneously provides one. Otherwise, no confidence statement should be solicited for “don’t know” responses. However, it could be useful to let the eyewitness state a basis for the

“don’t know” response (e.g., did not get a good view, none are familiar). The prelineup instructions should have already communicated to the eyewitness that a confidence statement will be requested (see Recommendation 5). These prelineup instructions help to prevent witnesses from drawing erroneous conclusions that their confidence is only being assessed because the lineup administrator thinks their decision is incorrect.

This recommendation is based on the fact that eyewitness confidence is a useful cue to the accuracy of a witness’s decision when instructions do not imply the presence of a culprit (Quinlivan et al., 2012), double-blind administration is used, and fair lineups are presented (Wixted & Wells, 2017). Specifically, confidence predicts accuracy among witnesses who choose from a photospread when immediate confidence reports are obtained (e.g., Brewer & Wells, 2006; Palmer, Brewer, Weber, & Nagesh, 2013; Sauer, Brewer, Zweck, & Weber, 2010). Note that forcing witnesses to withhold their confidence reports for as little as 5 min has been found to undermine the predictive value of confidence, unless witnesses are required to spend that time reflecting on the witnessing conditions and identification procedure, or producing reasons why they might have made an incorrect decision (Brewer, Keast, & Rishworth, 2002).

The corpus of data suggesting that confidence is a useful cue to eyewitness accuracy stands in stark contrast to DNA exonerations in which innocent people were mistakenly identified in court by highly confident eyewitnesses, most of whom were demonstrably less confident at the time of the initial identification (e.g., Garrett, 2011). If confidence is a useful cue to accuracy, how could these mistaken witnesses have been so confident? The answer lies in the fact that intervening postdecision events can dramatically shift witnesses’ reports of their confidence from low at the time of identification to high at the time of trial. As a result, these shifts render delayed reports nearly useless as cues to accuracy. However, if confidence reports are taken immediately after an identification decision, the integrity of confidence as a cue to accuracy is enhanced considerably.

We recommend that confidence statements be collected on a graded scale using words (e.g., “positive,” “probably,” “maybe”) or numbers (e.g., from 0% confident to 100% confident). The key element of this recommendation is that an immediate record of a witness’s confidence is collected. Immediate confidence estimates are the only way to ensure that postidentification variables do not contaminate subsequent confidence reports.

We focus on *immediate* confidence reports because seemingly innocuous postdecision events can contaminate witnesses’ confidence reports, undermining what could have been forensically meaningful information from an eyewitness. One of the most heavily researched of these events involves postidentification feedback offered by a lineup administrator in the form of a simple comment confirming the witness’s decision. Such feedback can dramatically inflate confidence reports. In the original test of the postidentification feedback effect (Wells & Bradfield, 1998), researchers provided inaccurate witnesses with such a comment: “Good, you identified the suspect.” That simple statement resulted in 50% of inaccurate witnesses reporting that their confidence was a 6 or 7 on a 7-point scale (compared with only 15% of witnesses in the control condition). Importantly, the inflated confidence report created by this feedback is a *retrospective judgment* because witnesses indicate how confident they were at the time of their

identification, before they knew their decision was correct. Any resulting confidence inflation obviously obscures a true picture of the witness’s experience at the time of the identification decision. The effect of postidentification feedback is robust and reliable (see meta-analysis by Steblay et al., 2014). It also features prominently in some judicial decisions as courts grapple with how to ensure that eyewitness identification testimony truly reflects the witness’s experience of making an identification decision, rather than the influence of extramemorial variables (e.g., *New Jersey v. Henderson*, 2011; *Oregon v. Lawson*, 2012).

Beyond affecting witnesses’ self-reports, distorted confidence judgments complicate assessments of witness identification decisions. Indeed, several experiments show us that evaluators rate inaccurate witnesses who have received confirming feedback as more credible than those who received disconfirming feedback or no feedback, even when evaluators are instructed to ignore the feedback and even when an explicit confidence statement is not available (Douglass, Neuschatz, Imrich, & Wilkinson, 2010). Because postidentification feedback inflates the confidence of inaccurate witnesses more than the confidence of accurate witnesses, it also impairs fact finders’ abilities to distinguish accurate from inaccurate witnesses (Bradfield et al., 2002; Smalarz & Wells, 2014b).

Recommending an immediate confidence report is an important companion to the recommendation that the entire lineup procedure be video-recorded (see Recommendation 7). Not only can video-recording demonstrate whether postidentification feedback was given, but it can also preserve witness nonverbal cues that may signal accuracy (Matuku, Douglass, & Charman, 2018). In the absence of a video-recorded identification procedure, triers of fact who learn that a witness’s confidence has inflated over time are sometimes unwilling to impugn the witness’s credibility (Bradfield & McQuiston, 2004), especially if a compelling explanation accompanies the inflation (e.g., “I had an epiphany!”; Jones et al., 2008). However, if evaluators see the identification procedure in which a witness’s initial confidence is lackluster, their assessments of a highly confident trial witness are less positive, which is an important shift when the highly confident witness has identified the wrong person (Douglass & Jones, 2013).

Beyond distorting evaluators’ ability to assess witnesses, contaminated witness reports may also unduly shape preliminary investigations by (a) triggering biased evaluations of subsequent pieces of evidence and/or (b) biasing the integration of evidence against the identified suspect. For example, a witness who is highly confident in a mistaken identification may trigger investigators to view the suspect’s alibi as weaker than it would have been otherwise or may suggest to investigators that they suspend pursuit of additional suspects (for a discussion of these effects see Charman, Douglass, & Mook, 2019). Recording a witness’s immediate confidence eliminates the potential for subsequent inflations to go unnoticed.

If lineup administrators follow the recommendation to conduct double-blind procedures (Recommendation 3), they will be unable to provide postidentification feedback because they will not know which person is the suspect. Therefore, they will be unable to confirm (or disconfirm) any decision made by the witness. However, even vague positive comments (“You have been a good witness”) can be interpreted by witnesses as confirming feedback (Dysart, Lawson, & Rainey, 2012). Therefore, consistent with the

recommendation on prelineup instructions (Recommendation 5), witnesses should be explicitly told that the lineup administrator does not know which person is the suspect and which people are fillers.

Even if administrators correctly implement double-blind procedures and prelineup instructions, it is still imperative to collect immediate confidence reports because witnesses may encounter postidentification feedback in multiple other ways. For example, the mere fact that a case proceeds to trial is a form of confirmation that a prior identification was correct (see also Berkowitz & Frenda, 2018; Wade, Nash, & Lindsay, 2018 for other types of real world contamination). Another potential source of contamination comes from witnesses who conduct their own investigations via social media searches, often accompanied by cowitnesses who may be able to “confirm” that an Instagram or Facebook photo represents the culprit (Douglass & Smalarz, 2019).

Recommendation 7: Video-Recording

The entire identification procedure, including prelineup instructions and witness confidence statement, should be video-recorded.

To preserve a faithful record of the conditions under which witnesses make their identifications, we recommend that the entire interaction between the police and the witness be video-recorded—from the time when the witness is given the very first prelineup instructions through to the completion of the procedure when the witness has provided identification and confidence statements. The video must capture all features of the administration, including the interactions among the lineup administrator, the witness, and the lineup members (whether they are presented live or by photo). Under some circumstances, fully capturing the lineup administration may necessitate cameras recording from multiple angles. Although the authors of the original scientific review paper (Wells et al., 1998) recognized some of the benefits of video-recording a lineup administration, they did not include video-recording as one of their recommendations at that time. In part, video-recording the identification procedure was left out of the original set of recommendations because of concerns about the costs associated with making the record, including costs for equipment and materials. Since that time, the cost of video-recording interactions has decreased considerably and most adults have cellular phones capable of rendering high-quality video-records. Furthermore, increasing numbers of police now have access to body cameras that can be positioned to make video-recordings of identification procedures. Thus, we believe it is time to make the video-recording of lineup administrations standard practice as it is in some jurisdictions and in other countries (e.g., Australia).

In his response to the initial scientific review paper, Kassin (1998) noted two reasons why video-recording identification procedures should be considered best practice. First, police reports of what happened during an identification procedure may be incomplete or even inaccurate given that they are based on officers’ recollections of what happened during the procedure; recollections that are subject to the typical foibles of human memory. Second, it is possible that video-recording the identification procedure could encourage administrators to carefully adhere to best practices and deter them from engaging in any suggestive practices (Kassin, 1998). In the remainder of this section, we expand upon each of

these justifications for video-recording identification procedures, citing relevant research when it is available.

Clearly, video-recording identification procedures has the benefit of providing a more precise and accurate accounting of what happened during the procedure. Although it might be a rare occurrence, video-recording the procedure will make it more difficult for police officers to intentionally fabricate their reports of what occurred during the lineup administration. There is evidence of some police officers purposefully misrepresenting case-related events (Orfield, 1987, 1992; Slobogin, 1996), but even in the case of a conscientious, well-meaning officer, there are benefits of a more accurate reporting of the procedure through video-recording. For example, the memories of police officers are subject to the same cognitive errors as are those of others, including interference (e.g., Kane & Engle, 2000; Nairne, 2002) and memory intrusions from mental scripts about what usually occurs (e.g., Greenberg, Westcott, & Bailey, 1998; Kleider, Pezdek, Goldinger, & Kirk, 2008). One can easily imagine that memories from other lineups conducted or mental scripts for what should have happened could interfere with what a police officer remembers, and consequently reports, about an identification procedure. Indeed, there have been cases in which a police officer testified to reading mandated instructions verbatim to the witness, whereas the video-recording subsequently revealed improvisation that introduced suggestiveness into the procedure. Whether or not the officer was attempting to intentionally mislead or was genuinely mistaken, the actual procedure could be easily reviewed if it is video-recorded, and the fallibility of memory is no longer an issue.

In contrast, witnesses’ memories for a procedure are not likely to be influenced by interference or mental scripts regarding what usually happens given that most witnesses have never participated in a lineup before. However, their lack of expertise with the procedure will likely result in reports that are less complete (e.g., Chase & Simon, 1973; Gobet & Simon, 1996). Moreover, their reports of the procedure may be affected by the decay of their memory trace over time (Deffenbacher, Bornstein, McGorty, & Penrod, 2008) or postevent information (Loftus, 2004). The video-record would also provide clear information about how long it took the witness to make an identification. Witnesses’ estimates of time are often inaccurate (Yarmey, 2000), but time-to-identification is an important postdictor of witness accuracy: Identifications made more quickly are more likely to be accurate than are those made more slowly (Sporer, 1992). Although research has not provided a definitive cutoff that allows us to discriminate between accurate and inaccurate identifications (Brewer, Caon, Todd, & Weber, 2006; Weber, Brewer, Wells, Semmler, & Keast, 2004), having an accurate record of a witness’s time-to-identification can provide useful information to fact finders. In sum, despite knowing no evidence directly examining the accuracy of police officers’ and witnesses’ memories of identification procedures, we are confident that the basic cognitive research on memory errors generalizes to this context.

Although there is no direct evidence about the accuracy of police reports of identifications, police reports of witness interviews and suspect interrogation procedures omit important details about the procedures used (Kassin et al., 2017; Lamb et al., 2000). Moreover, testimony from witnesses about what happened during the procedure is even more likely to be subject to error given that police reports are likely to be written shortly after the event,

whereas testimony may be given months or years later. Video-recording the identification procedure allows police command staff to confirm that proper procedures are being followed. In addition, video-recording the procedure eliminates the need to rely on police officers' or witnesses' memories for the event at trial. In many cases, detectives might not have to testify during suppression hearings if there is a video available, thereby saving staff resources and money by not having to pay officers to attend court.

When deciding a motion to suppress the identification, the judge could review the video and evaluate the suggestiveness of the procedure herself rather than relying on attorneys' characterizations of the procedure based on their readings of police reports and witness testimony. Defense attorneys might review the video-recording when deciding whether to offer a plea or encourage a client to accept one, whereas prosecutors might review the video-recording when evaluating the strength of a case and how to proceed. Moreover, in the United States a suspect does not have the right to have an attorney present at a preindictment identification procedure and never has the right to have an attorney present at a photo lineup procedure (*United States v. Ash*, 1973). In the absence of an attorney to view the identification procedure, the video-recording could help defense attorneys to better represent their clients following identification. In addition, eyewitness experts could be asked to review the video-recording and either testify or prepare a written report about the identification procedure. Finally, the video-recording could be introduced as evidence at trial so that fact finders can judge for themselves whether the procedure was suggestive, whether the witnesses engaged in any behaviors that either enhanced or diminished their credibility, or whether the witness's confidence was inflated (e.g., Douglass & Jones, 2013).

Although the data on this topic are limited, and there are no known data on how judges or attorneys might evaluate video-records of identification procedures, there are a handful of studies that explore the effects of watching the video-recording of an eyewitness identification procedure on mock juror judgments. Most of these studies have tested whether viewing a video-recording of the identification procedure helps jurors evaluate the accuracy of witness identifications (Beaudry et al., 2015; Reardon & Fisher, 2011). In one study, watching the video-recording helped participants distinguish between accurate and inaccurate witnesses (Reardon & Fisher, 2011). In another study (Beaudry et al., 2015), confirmatory feedback interfered with the ability of participant-judges to differentiate between accurate and inaccurate witnesses, with participants judging the witnesses who received confirmatory feedback to be more accurate irrespective of their actual accuracy. Participants' judgments of accuracy were unaffected by whether the lineup was conducted using single- or double-blind procedures, irrespective of whether the participants had viewed the video of the procedure. However, these videos were relatively short ($M = 1$ m, 37 s) and it is not clear from the report of the study how much influence the administrators exerted in the single-blind conditions. In a study that manipulated whether the videotape contained evidence of administrator influence, watching a video-recording of a single-blind versus a double-blind procedure did influence jurors' verdicts (Modjadidi & Kovera, 2018). Specifically, watching the video-recording increased participants' ratings of procedural suggestiveness and decreased their guilty verdicts when the video-recording depicted witness steering

that can occur in a single-blind administration as opposed to a double-blind administration. Thus, the limited evidence available suggests that watching the video-recording of a lineup administration will help jurors (and perhaps judges and attorneys) evaluate whether a lineup procedure was suggestive.

Finally, video-recording the identification procedure could encourage administrators to ensure that their conduct conforms to best practices and deter them from engaging in any suggestive procedures. Although we know of no studies that directly test whether video-recording can change the behaviors of administrators of identification procedures, the issue has been examined in the context of interrogation practices. In a mock crime and interrogation paradigm, researchers manipulated the actual guilt-innocence of suspects who were then subjected to interrogations conducted by police officers who were either informed or uninformed regarding the researcher's recording of the interrogation session (Kassin, Kukucka, Lawson, & DeCarlo, 2014). Police officers who knew that they were being recorded were significantly less likely to use minimization tactics and somewhat less likely (although not significantly so) to use maximization tactics; both tactics are known to increase rates of false confessions (Kassin et al., 2010). In addition, participant-suspects (who were made aware of the video-recording manipulation) reported that the police officers who did not know they were being recorded tried harder to make them confess than did police officers who knew about the recording. Thus, there is evidence, albeit from outside the eyewitness arena, that video-recording police procedure can deter undesirable behaviors.

There are few data on the question of whether video-recording eyewitness identification procedures might change the behavior of eyewitnesses. But there are good data indicating that even crime suspects are not inhibited by video-recording during interrogations and that people quickly forget that they are being recorded (Kassin et al., 2019).

In sum, both logic and the available empirical evidence support the recommendation to video-record all identification procedures. If the procedure is to be recorded, it should be recorded in a way that captures all relevant information about the procedure, including the verbal and nonverbal behaviors of the witness, the administrator, and the lineup members. Research from the interrogation literature makes it clear that camera angle matters, in that people attribute causality to the person who is the focus of the video-recording (Lassiter, 2010; Lassiter et al., 2009; Ratcliff et al., 2006). In the case of interrogations, a camera focused on the suspect causes evaluators to be more likely to view a confession as voluntary and more likely to judge them to be guilty than if the camera was focused on the interrogator or equally on the suspect and the interrogator. It is reasonable to believe that a camera focused on the witness may similarly cause evaluators to overlook suggestive behaviors on the part of administrator, or features and behaviors of suspects that make them stand out from the other lineup members. However, a video-recording of an identification procedure that includes information about the witness, the administrator, and lineup members can provide a complete record of the procedure that documents suggestive practices when they are present and protects the police from unjustified and time-consuming claims of bias when the procedure was free from suggestion.

Recommendation 8: Avoid Repeated Identification Procedures With the Same Witness and Suspect

Repeating an identification procedure with the same suspect and same eyewitness should be avoided regardless of whether the eyewitness identified the suspect in the initial identification procedure.

This recommendation holds no matter how compelling the argument in favor of a second identification might seem (e.g., the original photo of the suspect was not as good as it could have been; the witness was nervous during the first identification test and is calmer now; the initial identification was made from a social media profile, but it would be more desirable to have an identification made using proper police procedures). The importance of focusing on the first identification test cannot be emphasized strongly enough.

There are certain kinds of forensic evidence for which repeated testing is not only acceptable but also desirable. A crime scene fingerprint comparison with a suspect's prints, for example, might be subjected to repeated comparisons to confirm a conclusion. Likewise, given a sufficient amount of biological material from a crime scene, forensic examiners might test only a small portion of the sample for DNA, allowing for subsequent testing by a different analyst or different means of evaluation. However, eyewitness identification evidence has a unique characteristic that makes it unsuitable for what might be called "repeated testing." Whether the eyewitness is asked to make an identification with a showup or a lineup, there is only one *uncontaminated* opportunity for a given eyewitness to make an identification of a particular suspect. Any subsequent identification test with that same eyewitness and that same suspect is contaminated by the eyewitness's experience on the initial test.

For purposes of our recommendation, repeated identification tests refer to a situation in which an eyewitness is given a subsequent identification test (or more) with the *same* suspect that appeared in an earlier identification test. We are not referring to a situation in which an eyewitness is given an identification test with one suspect and then, after rejecting that suspect, is given an identification test with a *different* suspect and different fillers. Nor are we referring to a situation in which there were multiple culprits and the eyewitness is given a separate identification test for each culprit.

There are many ways in which the use of repeated identification procedures surface in criminal cases. For example, eyewitnesses might view a mug book that contains the suspect prior to viewing a lineup that includes that suspect, or an eyewitness might first view a showup and then later be shown a lineup with that same suspect. A repeated identification can also occur when the eyewitness views a lineup and makes a tentative pick (or no pick) and then, at a later time, sees a second lineup with that same suspect and new fillers. Sometimes a witness is first shown a photo lineup and then later is shown a live lineup using that same suspect. Other times the first lineup uses one photo of the suspect, and the second lineup contains a different photo of the same suspect. Perhaps the most common repeated identification procedure of all is when the witness makes an out-of-court identification (from a showup or a lineup) and then is asked to repeat that identification in court (i.e., an in-court or "dock" identification) at pretrial hearings or at trial or at both the pretrial hearing and at trial.

At a theoretical level, there are at least three processes by which an initial identification test that includes a given suspect can *contaminate* a later identification test if the later test includes that same suspect (Deffenbacher, Bornstein, & Penrod, 2006; Steblay & Dysart, 2016). One such process is memory-source error (or "source monitoring error"; see Johnson, Hashtroudi, & Lindsay, 1993). Memory-source error is implicated when the eyewitness perceives the suspect in the second identification procedure to be familiar and misattributes the familiarity to the original witnessed event rather than to the fact that the previous identification procedure included that face. In this type of effect, even though the eyewitness did not identify the suspect in the first identification procedure, that person's face was made familiar by its appearance in the first procedure. This source misattribution effect, which involves a dissociation between familiarity and an awareness of the source of that familiarity, was first demonstrated over 40 years ago (Brown, Deffenbacher, & Sturgill, 1977). It is closely related to other phenomena such as familiarity without awareness (Mandler, 1980), the false fame effect (Jacoby, Woloshyn, & Kelley, 1989), and the "bystander effect," in which a bystander to the crime is identified as the culprit due to a misattribution of familiarity (Ross, Ceci, Dunning, & Toglia, 1994). Simply being exposed to an innocent suspect in a mug book, showup, or a lineup increases the chances of that person being identified in a later lineup even if the witness did not choose the person in the first identification procedure (e.g., Brown et al., 1977; Dysart, Lindsay, Hammond, & Dupuis, 2001; Haw, Dickinson, & Meissner, 2007; Hinz & Pezdek, 2001; Lawson & Dysart, 2014; Steblay, Tix, & Benson, 2013).

A second process by which the first identification procedure can contaminate the later identification procedure is when the eyewitness identifies the suspect in the initial identification procedure and is later given another identification procedure with that same suspect and a different set of fillers. In this case, the initial identification, even if mistaken, causes the witness to simply repeat the same identification in the second identification procedure. A meta-analysis of this *commitment effect* has provided strong evidence that a mistaken identification in an initial identification procedure tends to be repeated in a second identification procedure if that lineup contains the mistakenly identified person (Deffenbacher et al., 2006). More recent studies have provided additional support for this effect (e.g., Godfrey & Clark, 2010; Goodsell, Neuschatz, & Gronlund, 2009; Hinz & Pezdek, 2001; Lawson & Dysart, 2014; Pezdek & Blandon-Gitlin, 2005; Steblay et al., 2013; Valentine, Davis, Memon, & Roberts, 2012). Researchers have argued that commitment, which is the powerful tendency to stick with an earlier decision that was freely made, is the psychological mechanism underlying this effect. But commitment is not the only process by which an initial mistaken identification results in a repeat mistaken identification of the same person in a subsequent identification test. For example, there is evidence that the act of identifying an innocent person in an initial identification procedure changes the eyewitness's memory away from the culprit and toward the person identified, a process that is intensified if the witness is given confirming feedback following the initial mistaken identification (Smalarz & Wells, 2014a).

Although not yet specifically tested in controlled experiments, there is a third possible process by which repeating the same suspect in a second identification procedure can contaminate the

second identification decision. Specifically, it is possible for the eyewitness who makes no identification in the first procedure (e.g., a photo lineup) to later consciously and explicitly recognize that there is only one person in the second procedure (e.g., a live lineup) who was also in the first procedure. In effect, this “gives away” the hypothesis of police investigators by communicating to the eyewitness which person is the suspect (i.e., the person in common between the two procedures). In other words, this type of repeated procedure violates a fundamental characteristic of a good lineup, namely that there not be aspects of the procedure that leak information about which person is the suspect in the lineup (Wells & Luus, 1990).

Any of these processes might occur in a given situation that involves repeating the suspect in an identification procedure. For this reason, we recommend that repeated identification procedures be avoided. Of course, it could be argued that if the witness identifies the suspect in the first identification procedure then there is no harm in repeating the identification procedure. After all, the identification has already been made and the second identification procedure is merely a confirmatory process. However, there is good evidence that repeated testing of eyewitnesses leads to artificially elevated levels of eyewitness confidence (Shaw, Garven, & Wood, 1997; Shaw & McClure, 1996). Repeatedly asking a question appears to lead to increased ease or fluency of answering the question, which leads witnesses to develop a stronger sense of confidence that their answer is correct, even when their answer is incorrect (Shaw, 1996).

Finally, it is important to note that when witnesses make identifications outside of a police procedure, any additional identification procedure conducted by the police is a second identification attempt. Witnesses may spontaneously identify someone as the culprit as they walk about their daily lives. Sometimes witnesses to crimes launch their own investigations. They may hear the culprit referred to by a nickname or street name and then search social media for someone using that name. Or they may search the social media connections of someone they knew was present during a crime looking for the culprit. Whether an identification is made through a self-directed search of social media or spontaneously spotting a suspect on the street, this identification is the first identification, and it will contaminate any subsequent identification procedure the police might present to the witness.

Recommendation 9: Showups

Showups should be avoided whenever it is possible to conduct a lineup (e.g., if probable cause exists to arrest the person then a showup should not be conducted.). Cases in which it is necessary to conduct a showup should use the procedural safeguards that are recommended for lineups, including the elimination of suggestive cues, a warning that the detained person might not be the culprit, video-recording the procedure, and securing a confidence statement.

The term *showup* refers to an eyewitness identification procedure in which a single individual is presented to the eyewitness and the eyewitness is asked whether this is the person who committed the crime in question. The primary defining feature that separates a showup from a lineup is the use of fillers: A showup has no fillers, whereas a lineup does. Showups have been heavily criticized as being extremely suggestive, a criticism that dates back

more than 100 years (Gross, 1911). In 1967, the U.S. Supreme Court, in reference to a showup identification, said that “It is hard to imagine a situation more clearly conveying the suggestion to the witness that the one presented is believed to be guilty by the police” (*United States v. Wade*, 1967, p. 226). Despite the strong language seemingly condemning showups, the U.S. Supreme Court has consistently supported the admissibility of showups (e.g., see *Manson v. Braithwaite*, 1977; *Neil v. Biggers*, 1972) provided that the witness shows evidence of reliability in other ways. The Court listed five factors to consider that might indicate that a suggestive procedure could nevertheless be reliable, namely that (a) the witness had a good opportunity to view the culprit, (b) the witness paid good attention while witnessing, (c) the witness gave a good description of the culprit, (d) there was a short delay between the witnessed event and the identification, and (e) the witness made the identification with high confidence. These criteria have been strongly criticized by eyewitness scientists on a variety of counts, especially when the procedure was suggestive (Wells & Quinlivan, 2009).

In practice, showups tend to be conducted under specific conditions. In particular, showups tend to be restricted to situations in which an individual who fits the description of the culprit of a crime is detained in the general vicinity of the crime shortly after the crime has occurred. As discussed in the introduction to this article, there is a rationale for sometimes permitting showups under these conditions (fit description, proximity to crime, and soon after the crime occurred). The rationale is that there is not enough time to construct and conduct a lineup procedure because the detained person can only be detained for a relatively short period of time unless there are grounds for arrest. Fitting a description of the culprit is not, in and of itself, grounds for arrest. So, unless there is probable cause for arresting the detained person, the choice is not between conducting a lineup and conducting a showup; rather, the choice is between conducting a showup or setting the detained person free, thereby potentially creating a public safety issue. Moreover, because showups sometimes result in eyewitnesses rejecting the detained person as being the culprit (see Gonzalez, Ellsworth, & Pembroke, 1993), showups can result in innocent people being quickly excluded as possible suspects, thereby allowing a continuation of the search for the true offender.

About 15% of DNA exonerations involving eyewitness identification involved showups (West & Meterko, 2017). Experiments comparing lineups with showups reveal that lineups are clearly superior to showups in terms of the lineup procedure’s ability to distinguish between innocent and guilty suspects (e.g., Clark, 2012a; Dekle, Beal, Elliot, & Huneycutt, 1996; Gronlund et al., 2012; Mickes, 2015; Steblay, Dysart, Fulero, & Lindsay, 2003; Wetmore et al., 2015; Yarmey, Yarmey, & Yarmey, 1996; see meta-analysis by Neuschatz et al., 2016). Interestingly, however, witnesses are no more likely to make an affirmative identification with a showup than with a lineup (Gonzalez et al., 1993; Wells, 2001). In fact, witnesses actually make *more* affirmative identification responses to lineups than to showups, perhaps because there are more people from whom to choose. However, inaccurate identifications from showups always fall on the innocent suspect, whereas in lineups such inaccurate choices tend to spread across known-innocent fillers (Smith et al., 2017; Wells, 2001). In several ways, the fillers used in a lineup act as a safeguard, protecting the innocent suspect from mistaken identification—a form of protec-

tion that does not exist for showups (see [Wixted & Mickes, 2014](#), for a different account of why lineups work better than showups).

Our recommendation is that showups should be avoided (and a lineup conducted instead), if at all possible. For example, a showup can be avoided and a lineup used instead if there is probable cause for arresting a detained person instead of doing a showup. If, for example, the detained person is in possession of stolen goods, is in possession of an unauthorized firearm or other weapon, or has an outstanding warrant, then the person should be arrested. Indeed, without evidence linking the detained person to the crime (other than being in the vicinity of where it was committed, which—as noted previously—is not evidence-based suspicion), officers are using the most suggestive identification procedure (a showup) when base rates of guilt are the lowest. A lineup for the arrested individual can then be arranged rather than a showup. Another situation in which showups can sometimes be avoided occurs when there are multiple witnesses. In cases of multiple witnesses, a showup can be conducted with one of the witnesses and, if an identification is made, the identification becomes grounds for arrest. The remaining witnesses can then be preserved for more reliable lineup procedures, which should be conducted only after evidence is developed connecting the suspect to the specific witnessed crime.

Reducing the Suggestiveness of Showups

Although showups are clearly less reliable than lineups, there are some ways to reduce the suggestiveness of showups. First, many of the features of a good lineup procedure can be incorporated into showup procedures. For example, recent research finds that a preshowup instruction about additional opportunities can be effective in reducing mistaken identifications with little or no reduction in accurate identifications ([Eisen, Smith, Olaguez, & Skerrett-Perta, 2017](#); [Smith, Wells, Lindsay, & Myerson, 2018](#)). This additional-opportunities instruction simply tells witnesses prior to viewing the detained person that if they do not think the person is the culprit, they might have additional opportunities to view someone else. The theory behind the additional-opportunities instruction is that witnesses set a low criterion for making an identification with showups because they assume that this is their only opportunity to identify the culprit.

As with lineups, eyewitnesses who participate in a showup procedure should be asked to report how confident they are in their identification or rejection decision. In addition, as with lineups, showups should be video-recorded, a recommendation that is relatively easy to implement now that dashboard-mounted and body-worn cameras are increasingly commonplace (see Recommendation 7). The video of the showup should start before the witness is instructed and continue through the witness's confidence statement, and should include the officer, witness, and suspect in view.

Because showups are conducted in the field during which search-and-detain operations are actively unfolding, care should be taken to ensure that witnesses do not overhear police radio conversations that could prejudice a showup procedure. In an experiment using a high-realism paradigm for studying showup identifications, overhearing the suggestion that the sheriff had caught the guy significantly increased false identifications from showups but

did not affect accurate culprit identifications ([Eisen, Skerrett-Perta, Jones, Owen, & Cedre, 2017](#)).

Clothing is often a central feature of an eyewitness's description that police use for finding a person who is then detained for a showup. The concern is that the eyewitness might identify the person based primarily on the clothing (see [Lindsay et al., 1987](#)). In cases in which the person was detained based on a clothing description, consideration should be given to covering the person's clothing with a blanket for the showup identification test.

For legal reasons, eyewitnesses are usually brought to the location of the detained person for a showup rather than the detained person being brought to the eyewitness, because transporting the detained person is usually considered an arrest. Consistent with our recommendations, if the detained person can be arrested, then a lineup should be conducted rather than a showup. Taking the eyewitness to the detained individual rather than the reverse also makes it easier in multiple-witness cases to ensure that the witnesses are not contaminated by observing an identification decision made by another witness. As noted previously, if one witness makes an identification, then that would normally be considered probable cause for arrest and the remaining witnesses can later be shown a lineup instead of a showup. Placing the detained person in handcuffs or in the back seat of a patrol car for the showup can suggest to the witness that the person has been arrested. This indication that the person has been arrested, in turn, can suggest to the eyewitness that there is evidence against the detained person beyond simply matching the description of the suspect. Hence, unless there is reason to believe that the detained person is a flight risk, these types of restraints should be avoided during a showup.

Severe limits on safeguards with showups. Obviously, there are some critical safeguards that can be used with lineups that cannot be used with showups. By definition, showups do not include fillers, which is a key safeguard. But showups also cannot be double-blind. In fact, showups cannot ever be single blind. After all, both the showup administrator and the eyewitness know which person is the suspect, namely the person being presented to the eyewitness.

In-court identifications as showups. The current article concerns policies and procedures for collecting and preserving eyewitness identification evidence rather than how courts handle eyewitness evidence. Nevertheless, there is a common courtroom procedure known as an in-court identification (or a dock identification) in which an eyewitness on the stand is asked if she or he can identify the culprit in the courtroom. The defendant typically is sitting at the defense counsel table rather than embedded among known-innocent fillers who fit the description of the culprit. Hence, an in-court identification is closely analogous to a showup. In terms of suggestiveness, the in-court identification is arguably even more suggestive than a typical showup because it is clear to the witness that the defendant has already been indicted. Moreover, it is usually the case that the eyewitness has already identified the defendant in a precourt procedure, which means that the in-court identification is a repeated identification that goes directly against Recommendation 8 (e.g., avoid repeated identifications). And, if the eyewitness has not already identified the defendant in a proper precourt procedure, the showup nature of an in-court identification should not be considered an acceptable alternative to a properly constructed and conducted lineup. The low probative value of an

in-court identification raises serious concerns that its prejudicial value exceeds its probative value.

Final Observations

The current set of recommendations for the collection and preservation of eyewitness identification evidence is being proposed under a much different set of conditions than existed when the 1998 scientific review paper recommendations were published. Prior to 1998, there was no official set of recommendations from a scientific body on eyewitness identification nor were there any guidelines from the legal system that were grounded in science.

Since the 1998 scientific review paper, however, numerous agencies, governing bodies, and organizations have proposed guidelines for collecting and preserving eyewitness identification evidence. These include the U.S. Department of Justice Guide ([Technical Working Group on Eyewitness Evidence, 1999](#); reinforced recently by a directive from the [United States Department of Justice, 2017](#)), which followed closely on the 1998 scientific review paper as discussed in the introduction to the current article. Furthermore, a large set of U.S. state-wide reform guidelines have been enacted that range from the recommendations of state justice departments (e.g., Wisconsin), to executive orders from their Attorneys General (e.g., New Jersey), to court mandates (e.g., Oregon), to laws passed by state legislatures (e.g., North Carolina). In fact, in the United States there are now 21 states that require reforms through one or more of these mechanisms, namely California, Colorado, Connecticut, Florida, Georgia, Kansas, Illinois, Louisiana, Maryland, New Hampshire, Nebraska, Nevada, New Jersey, New York, North Carolina, Ohio, Oregon, Texas, Vermont, West Virginia, and Wisconsin. In other states, such as Montana, Hawaii, Minnesota, Pennsylvania, Iowa, Maine, Michigan, Washington, Idaho, and Rhode Island, police departments in major metropolitan areas have revamped their procedures. In effect, the reform of eyewitness identification procedures has been a chain-reaction going back to the 1998 scientific review paper, the Department of Justice guide in 1999, and the first state to adopt reforms (New Jersey in 2002). Each jurisdiction has modeled its reforms around those that preceded it and, hence, include the core four recommendations that were presented in the original 1998 scientific review paper (i.e., prelineup instructions, how to select fillers for the lineup, the need to collect a measure of witness confidence at the time of the identification, and the use of a double-blind procedure).

An important document relating to eyewitness identification procedures that was generated in recent years deserves special notice. The International Association of Chiefs of Police (IACP) produced a position article in 2016, in which they made specific recommendations regarding how lineups and showups should be conducted ([International Association of Chiefs of Police, 2016](#)). The IACP policy document goes beyond what most state reforms have done and goes beyond the recommendations in the 1998 scientific review paper. Specifically, the IACP recommendations not only include the four core recommendations, but also, like the current article, recommend avoiding multiple identifications procedures using the same witness and suspect, recommend video-recording the identification procedure, and make recommendations about showups that are similar to the recommendations that we offer in the current article. There are two recommendations in the

current scientific review paper, however, that are not in the IACP policy, namely Recommendation 1 (Prelineup interview of the eyewitness) and Recommendation 2 (Evidence-based suspicion).

We note that the IACP policy document, like the policy documents that have been adopted in various states and localities, is almost exclusively a *prescriptive* document. Short, prescriptive documents can make sense for policy documents. The IACP policy, for example, is a mere four pages covering lineups and showups. Similarly, eyewitness identification policies and procedures documents adopted in various states and agencies are largely devoid of sustained rationale and explanations. In other words, these policy documents specify certain procedures, but they do not explain the rationale behind the procedures or review relevant science pertaining to the prescribed procedures. Hence, the current scientific review paper, like the 1998 scientific review paper, serves an important function that other policy documents do not, namely the function of documenting relevant science, where available, and an articulating rationale around each of the recommendations.

Earlier in this article we briefly alluded to an observation that deserves to be reemphasized. Although our nine recommendations are relatively specific and detailed, the most important aspects of our recommendations are the underlying principles associated with those recommendations. The double-blind administration of lineups, for example, is based on the principle that procedures must be in place to prevent the lineup administrator's knowledge of which person is the suspect to influence the eyewitness. Our specific preference for double-blind administration, however, is not the only way to achieve this prevention. With photo lineups, for instance, a properly programmed computer could administer the lineup without any administrator in the room at all. The underlying principle is important for another reason as well, namely that the specific recommendation might be technically followed and yet the principle itself is violated at some other point or level. Consider, for example, the invitation to view a lineup recommendation: "When inviting an eyewitness to attend a lineup procedure, police should not suggest that a suspect has been arrested or that the culprit will be present in the identification procedure." The underlying principle concerns the need to avoid communications to the eyewitness that could undermine the later prelineup instructions emphasizing that the culprit might not be in the lineup. Although the invitation to view a lineup might be the most likely time at which this principle is violated, it is not the only possible time. In this sense, the underlying principle is more important than the specific wording of the recommendation.

Finally, we think it is important for law enforcement to understand why certain procedures are recommended for constructing and conducting eyewitness identification procedures rather than simply being instructed on how to conduct those procedures. The current article provides valuable background on how research in areas such as perception, memory, decision making, and social influence can inform recommendations on lineup construction and presentation. Thus, in line with the [National Research Council \(2014\)](#) report on eyewitness evidence that highlights the importance of training for law enforcement, we believe that this article could serve as a useful resource for developing and implementing such training.

References

- Ackil, J. K., & Zaragoza, M. S. (1998). Memorial consequences of forced confabulation: Age differences in susceptibility to false memories. *Developmental Psychology*, 34, 1358–1372. <http://dx.doi.org/10.1037/0012-1649.34.6.1358>
- Beaudry, J. L., Lindsay, R. C. L., Leach, A.-M., Mansour, J. K., Bertrand, M. I., & Kalmel, N. (2015). The effect of evidence type, identification accuracy, line-up presentation, and line-up administration on observers' perceptions of eyewitnesses. *Legal and Criminological Psychology*, 20, 343–364. <http://dx.doi.org/10.1111/lcrp.12030>
- Behrman, B. W., & Davey, S. L. (2001). Eyewitness identification in actual criminal cases: An archival analysis. *Law and Human Behavior*, 25, 475–491. <http://dx.doi.org/10.1023/A:1012840831846>
- Behrman, B. W., & Richards, R. E. (2005). Suspect/foil identification in actual crimes and in the laboratory: A reality monitoring analysis. *Law and Human Behavior*, 29, 279–301. <http://dx.doi.org/10.1007/s10979-005-3617-y>
- Bergold, A. N., & Heaton, P. (2018). Does filler database size influence identification accuracy? *Law and Human Behavior*, 42, 227–243. <http://dx.doi.org/10.1037/lhb0000289>
- Berkowitz, S. R., & Frenda, S. J. (2018). Rethinking the confident eyewitness: A reply to Wixted, Mickes, & Fisher. *Perspectives on Psychological Science*, 13, 336–338. <http://dx.doi.org/10.1177/1745691617751883>
- Berkowitz, S. R., & Loftus, E. F. (2018). Misinformation in the courtroom. In H. Otgaar & M. L. Howe (Eds.), *Finding the truth in the courtroom: Dealing with deception, lies, and memories* (pp. 11–30). New York, NY: Oxford University Press.
- Borchard, E. (1932). *Convicting the innocent: Errors of criminal justice*. New Haven, CT: Yale University Press.
- Bradfield, A., & McQuiston, D. E. (2004). When does evidence of eyewitness confidence inflation affect judgments in a criminal trial? *Law and Human Behavior*, 28, 369–387. <http://dx.doi.org/10.1023/B:LAHU.0000039331.54147.ff>
- Bradfield, A. L., Wells, G. L., & Olson, E. A. (2002). The damaging effect of confirming feedback on the relation between eyewitness certainty and identification accuracy. *Journal of Applied Psychology*, 87, 112–120. <http://dx.doi.org/10.1037/0021-9010.87.1.112>
- Brainerd, C. J., & Reyna, V. F. (2005). *The science of false memory*. New York, NY: Oxford University Press. <http://dx.doi.org/10.1093/acprof:oso/9780195154054.001.0001>
- Brandon, R., & Davies, C. (1973). *Wrongful imprisonment: Mistaken convictions and their consequences*. London, UK: George Allen and Unwin.
- Brewer, N., Caon, A., Todd, C., & Weber, N. (2006). Eyewitness identification accuracy and response latency. *Law and Human Behavior*, 30, 31–50. <http://dx.doi.org/10.1007/s10979-006-9002-7>
- Brewer, N., Keast, A., & Rishworth, A. (2002). The confidence-accuracy relationship in eyewitness identification: The effects of reflection and disconfirmation on correlation and calibration. *Journal of Experimental Psychology: Applied*, 8, 44–56. <http://dx.doi.org/10.1037/1076-898X.8.1.44>
- Brewer, N., Keast, A., & Sauer, J. D. (2010). Children's eyewitness identification performance: Effects of a Not Sure response option and accuracy motivation. *Legal and Criminological Psychology*, 15, 261–277. <http://dx.doi.org/10.1348/135532509X474822>
- Brewer, N., Vagadia, A. N., Hope, L., & Gabbert, F. (2018). Interviewing witnesses: Eliciting coarse-grain information. *Law and Human Behavior*, 42, 458–471. <http://dx.doi.org/10.1037/lhb0000294>
- Brewer, N., Weber, N., & Semmler, C. (2005). Eyewitness identification. In N. Brewer & K. D. Williams (Eds.), *Psychology and law: An empirical perspective* (pp. 177–221). New York, NY: Guilford Press.
- Brewer, N., & Wells, G. L. (2006). The confidence-accuracy relationship in eyewitness identification: Effects of lineup instructions, foil similarity, and target-absent base rates. *Journal of Experimental Psychology: Applied*, 12, 11–30. <http://dx.doi.org/10.1037/1076-898X.12.1.11>
- Brown, C., Lloyd-Jones, T. J., & Robinson, M. (2008). Eliciting person descriptions from eyewitnesses: A survey of police perceptions of eyewitness performance and reported use of interview techniques. *The European Journal of Cognitive Psychology*, 20, 529–560. <http://dx.doi.org/10.1080/09541440701728474>
- Brown, E., Deffenbacher, K., & Sturgill, W. (1977). Memory for faces and the circumstances of the encounter. *Journal of Applied Psychology*, 62, 311–318. <http://dx.doi.org/10.1037/0021-9010.62.3.311>
- Carlson, C. A., Jones, A. R., Whittington, J. E., Lockamy, R. F., Carlson, M. A., & Wooten, A. R. (2019). Lineup fairness: Propitious heterogeneity and the diagnostic feature-detection hypothesis. *Cognitive Research: Principles and Implications*, 4, 20–26. <http://dx.doi.org/10.1186/s41235-019-0172-5>
- Ceci, S. J., & Bruck, M. (1995). *Jeopardy in the courtroom: A scientific analysis of children's testimony*. Washington, DC: American Psychological Association. <http://dx.doi.org/10.1037/10180-000>
- Charman, S. D., Douglass, A. B., & Mook, A. (2019). Cognitive bias in forensic decision making. In N. Brewer & A. B. Douglass (Eds.), *Psychological science and the law* (pp. 30–53). New York, NY: Guilford Press.
- Charman, S. D., Matuku, K., & Mook, A. (2019). Non-blind lineup administration biases administrator's interpretation of ambiguous witness statements and their perceptions of the witness. *Applied Cognitive Psychology*, 33, 1260–1270. <http://dx.doi.org/10.1002/acp.3579>
- Charman, S. D., & Quiroz, V. (2016). Blind sequential lineup administration reduces both false identifications and confidence in those false identifications. *Law and Human Behavior*, 40, 477–487. <http://dx.doi.org/10.1037/lhb0000197>
- Charman, S. D., & Wells, G. L. (2007). Eyewitness lineups: Is the appearance-change instruction a good idea? *Law and Human Behavior*, 31, 3–22. <http://dx.doi.org/10.1007/s10979-006-9006-3>
- Charman, S. D., Wells, G. L., & Joy, S. W. (2011). The dud effect: Adding highly dissimilar fillers increases confidence in lineup identifications. *Law and Human Behavior*, 35, 479–500. <http://dx.doi.org/10.1007/s10979-010-9261-1>
- Chase, W. G., & Simon, H. A. (1973). Perceptions in chess. *Cognitive Psychology*, 4, 55–81. [http://dx.doi.org/10.1016/0010-0285\(73\)90004-2](http://dx.doi.org/10.1016/0010-0285(73)90004-2)
- Clark, S. E. (2005). A re-examination of the effects of biased lineup instructions in eyewitness identification. *Law and Human Behavior*, 29, 395–424. <http://dx.doi.org/10.1007/s10979-005-5690-7>
- Clark, S. E. (2012a). Costs and benefits of eyewitness identification reform: Psychological science and public policy. *Perspectives on Psychological Science*, 7, 238–259. <http://dx.doi.org/10.1177/1745691612439584>
- Clark, S. E. (2012b). Eyewitness identification reform: Data, theory, and due process. *Perspectives on Psychological Science*, 7, 279–283. <http://dx.doi.org/10.1177/1745691612444136>
- Clark, S. E., Brower, G. L., Rosenthal, R., Hicks, J. M., & Moreland, M. B. (2013). Lineup administrator influences on eyewitness identification and eyewitness confidence. *Journal of Applied Research in Memory & Cognition*, 2, 158–165. <http://dx.doi.org/10.1016/j.jarmac.2013.06.003>
- Clark, S. E., Howell, R. T., & Davey, S. L. (2008). Regularities in eyewitness identification. *Law and Human Behavior*, 32, 187–218. <http://dx.doi.org/10.1007/s10979-006-9082-4>
- Clark, S. E., & Wells, G. L. (2008). On the diagnosticity of multiple-witness identifications. *Law and Human Behavior*, 32, 406–422. <http://dx.doi.org/10.1007/s10979-007-9115-7>
- Clarke, C., Milne, R., & Bull, R. (2011). Interviewing suspects of crime: The impact of PEACE training, supervision and the presence of a legal advisor. *Journal of Investigative Psychology and Offender Profiling*, 8, 149–162. <http://dx.doi.org/10.1002/jip.144>

- Clifford, B. R., & George, R. (1996). A field evaluation of training in three methods of witness/victim investigative interviewing. *Psychology, Crime & Law*, 2, 231–248. <http://dx.doi.org/10.1080/10683169608409780>
- Colloff, M. F., Wade, K. A., & Strange, D. (2016). Unfair lineups make eyewitnesses more likely to confuse innocent and guilty suspects. *Psychological Science*, 27, 1227–1239. <http://dx.doi.org/10.1177/0956797616655789>
- Connors, E., Lundregan, T., Miller, N., & McEwan, T. (1996). *Convicted by juries, exonerated by science: Case studies in the use of DNA evidence to establish innocence after trial*. Alexandria, VA: National Institute of Justice.
- Corey, D., Malpass, R. S., & McQuiston, D. E. (1999). Parallelism in eyewitness and mock witness identifications. *Applied Cognitive Psychology*, 13, S41–S58.
- Crombag, H. F., Wagenaar, W. A., & Van Koppen, P. J. (1996). Crashing memories and the problem of 'source monitoring'. *Applied Cognitive Psychology*, 10, 95–104.
- Cutler, B. L., & Penrod, S. D. (1995). *Mistaken identification: The eyewitness, psychology, and the law*. New York, NY: Cambridge University Press.
- Dando, C. J., Geiselman, R. E., MacLeod, N., & Griffiths, A. (2015). Interviewing adult witnesses and victims. In G. Oxburgh, T. Myklebust, T. Grant, & R. Milne (Eds.), *Communication in investigative and legal contexts: Integrated approaches from forensic psychology, linguistics and law enforcement* (pp. 79–106). Hoboken, NJ: Wiley-Blackwell. <http://dx.doi.org/10.1002/9781118769133.ch5>
- Darling, S., Valentine, T., & Memon, A. (2008). Selection of lineup foils in operational contexts. *Applied Cognitive Psychology*, 22, 159–168. <http://dx.doi.org/10.1002/acp.1366>
- Deffenbacher, K. A., Bornstein, B. H., McGorty, E. K., & Penrod, S. D. (2008). Forgetting the once-seen face: Estimating the strength of an eyewitness's memory representation. *Journal of Experimental Psychology: Applied*, 14, 139–150. <http://dx.doi.org/10.1037/1076-898X.14.2.139>
- Deffenbacher, K. A., Bornstein, B. H., & Penrod, S. D. (2006). Mugshot exposure effects: Retroactive interference, source confusion, and unconscious transference. *Law and Human Behavior*, 30, 287–307. <http://dx.doi.org/10.1007/s10979-006-9008-1>
- Dekle, D. J., Beal, C. R., Elliot, R., & Huneycutt, D. (1996). Children as witnesses: A comparison of lineup versus showup identification methods. *Applied Cognitive Psychology*, 10, 1–12. [http://dx.doi.org/10.1002/\(SICI\)1099-0720\(199602\)10:1<1::AID-ACP354>3.0.CO;2-Y](http://dx.doi.org/10.1002/(SICI)1099-0720(199602)10:1<1::AID-ACP354>3.0.CO;2-Y)
- Demarchi, S., & Py, J. (2009). A method to enhance person description: A field study. In R. Bull, T. Valentine, & T. Williamson (Eds.), *Handbook of psychology of investigative interviewing: Current developments and future directions* (pp. 241–256). Chichester, UK: Wiley. <http://dx.doi.org/10.1002/9780470747599.ch14>
- Demarchi, S., Py, J., Groud-Than, S., Parain, T., & Brunel, M. (2013). Describing a face without overshadowing effect: Another benefice of the Person Description Interview. *Psychologie Française*, 58, 123–133. <http://dx.doi.org/10.1016/j.psfr.2013.01.002>
- Doob, A. N., & Kirshenbaum, H. M. (1973). Bias in police lineups—Partial remembering. *Journal of Police Science and Administration*, 1, 287–293. <http://dx.doi.org/10.1007/BF01039807>
- Douglass, A. B., Brewer, N., Semmler, C., Bustamante, L., & Hiley, A. (2013). The dynamic interaction between eyewitnesses and interviewers: The impact of differences in perspective on memory reports and interviewer behavior. *Law and Human Behavior*, 37, 290–301. <http://dx.doi.org/10.1037/lhb0000034>
- Douglass, A. B., & Jones, E. E. (2013). Confidence inflation in eyewitnesses: Seeing is not believing. *Legal and Criminological Psychology*, 18, 152–167. <http://dx.doi.org/10.1111/j.2044-8333.2011.02031.x>
- Douglass, A. B., Neuschatz, J. S., Imrich, J., & Wilkinson, M. (2010). Does post-identification feedback affect evaluations of eyewitness testimony and identification procedures? *Law and Human Behavior*, 34, 282–294. <http://dx.doi.org/10.1007/s10979-009-9189-5>
- Douglass, A. B., & Smalarz, L. (2019). Post-identification feedback: State of the science. In M. Miller & B. Bornstein (Eds.), *Advances in psychology and law* (pp. 101–136). New York, NY: Springer. http://dx.doi.org/10.1007/978-3-030-11042-0_4
- Douglass, A. B., Smith, C., & Fraser-Thill, R. (2005). A problem with double-blind photospread procedures: Photospread administrators use one eyewitness's confidence to influence the identification of another eyewitness. *Law and Human Behavior*, 29, 543–562. <http://dx.doi.org/10.1007/s10979-005-6830-9>
- Dysart, J. E., Lawson, V. Z., & Rainey, A. (2012). Blind lineup administration as a prophylactic against the postidentification feedback effect. *Law and Human Behavior*, 36, 312–319. <http://dx.doi.org/10.1037/h0093921>
- Dysart, J. E., Lindsay, R. C. L., Hammond, R., & Dupuis, P. (2001). Mug shot exposure prior to lineup identification: Interference, transference, and commitment effects. *Journal of Applied Psychology*, 86, 1280–1284. <http://dx.doi.org/10.1037/0021-9010.86.6.1280>
- Eisen, M. L., Gabbert, F., Ying, R., & Williams, J. (2017). "I think he had a tattoo on his neck": How co-witness discussions about a perpetrator's description can affect eyewitness identification decisions. *Journal of Applied Research in Memory & Cognition*, 6, 274–282. <http://dx.doi.org/10.1016/j.jarmac.2017.01.009>
- Eisen, M., Skeritt-Perta, A., Jones, J. M., Owen, J., & Cedre, G. C. (2017). Pre-admonition suggestion in live showups: When witnesses learn that the cops caught "the" guy. *Applied Cognitive Psychology*, 31, 520–529. <http://dx.doi.org/10.1002/acp.3349>
- Eisen, M., Smith, A. M., Olaguez, A. P., & Skeritt-Perta, A. S. (2017). An examination of showups conducted by law enforcement using a field-simulation paradigm. *Psychology, Public Policy, and Law*, 23, 1–22. <http://dx.doi.org/10.1037/law0000115>
- Ellis, H. D., Shepherd, J. W., & Davies, G. M. (1980). The deterioration of verbal descriptions of faces over different delay intervals. *Journal of Police Science and Administration*, 8, 101–106.
- Fahsing, I. A., Ask, K., & Granhag, P. A. (2004). The man behind the mask: Accuracy and predictors of eyewitness offender descriptions. *Journal of Applied Psychology*, 89, 722–729. <http://dx.doi.org/10.1037/0021-9010.89.4.722>
- Fawcett, J. M., Russell, E. J., Peace, K. A., & Christie, J. (2011). Of guns and geese: A meta-analytic review of the 'weapon focus' literature. *Psychology, Crime & Law*, 19, 35–66. <http://dx.doi.org/10.1080/1068316X.2011.599325>
- Fisher, R. P., & Geiselman, R. E. (1992). *Memory-enhancing techniques for investigative interviewing: The cognitive interview*. Springfield, IL: Charles C Thomas.
- Fisher, R. P., Schreiber Compo, N., Rivard, J., & Hirn, D. (2014). Interviewing witnesses. In T. J. Perfect & D. S. Lindsay's (Eds.), *The SAGE handbook of applied memory* (pp. 559–578). Los Angeles, CA: SAGE Publications. <http://dx.doi.org/10.4135/9781446294703.n31>
- Fitzgerald, R. J., Price, H. L., Oriet, C., & Charman, S. D. (2013). The effect of suspect-filler similarity on eyewitness identification decisions: A meta-analysis. *Psychology, Public Policy, and Law*, 19, 151–164. <http://dx.doi.org/10.1037/a0030618>
- Fitzgerald, R. J., Price, H. L., & Valentine, T. (2018). Eyewitness identification: Live, photo, and video lineups. *Psychology, Public Policy, and Law*, 24, 307–325. <http://dx.doi.org/10.1037/law0000164>
- Flin, R. H., & Shepherd, J. W. (1986). Tall stories: Eyewitnesses' ability to estimate height and weight characteristics. *Human Learning: Journal of Practical Research & Applications*, 5, 29–38.
- Flowe, H. D., Carline, A., & Karoglu, N. (2018). Testing the reflection assumption: A comparison of eyewitness ecology in the laboratory and

- criminal cases. *The International Journal of Evidence & Proof*, 22, 239–261. <http://dx.doi.org/10.1177/1365712718782996>
- Flowe, H. D., Takarangi, M. K. T., Humphries, J. E., & Wright, D. S. (2016). Alcohol and remembering a hypothetical sexual assault: Can people who were under the influence of alcohol during the event provide accurate testimony? *Memory*, 24, 1042–1061. <http://dx.doi.org/10.1080/09658211.2015.1064536>
- Frank, J., & Frank, B. (1957). *Not guilty*. London, UK: Gallanez.
- Gabbert, F., & Brown, C. (2015). Interviewing for face identification. In T. Valentine & J. P. Davis (Eds.), *Forensic facial identification: Theory and practice of identification from eyewitnesses, composites and CCTV* (pp. 15–41). Chichester, UK: Wiley.
- Gabbert, F., & Hope, L. (2013). Suggestibility and memory conformity. In A. M. Ridley, F. Gabbert, & D. J. La Rooy (Eds.), *Suggestibility in legal contexts: Psychological research and forensic implications* (pp. 63–84). London, UK: Wiley-Blackwell.
- Gabbert, F., Hope, L., & Fisher, R. P. (2009). Protecting eyewitness evidence: Examining the efficacy of a self-administered interview tool. *Law and Human Behavior*, 33, 298–307. <http://dx.doi.org/10.1007/s10979-008-9146-8>
- Gabbert, F., Memon, A., & Allan, K. (2003). Memory conformity: Can eyewitnesses influence each other's memories for an event? *Applied Cognitive Psychology*, 17, 533–543. <http://dx.doi.org/10.1002/acp.885>
- Gabbert, F., Memon, A., Allan, K., & Wright, D. B. (2004). Say it to my face: Examining the effects of socially encountered misinformation. *Legal and Criminological Psychology*, 9, 215–227. <http://dx.doi.org/10.1348/1355325041719428>
- Garrett, B. (2011). *Convicting the innocent: Where criminal prosecutions go wrong*. Cambridge, MA: Harvard University Press. <http://dx.doi.org/10.4159/harvard.9780674060982>
- Garrioch, L., & Brimacombe, C. A. E. (2001). Lineup administrators' expectations: Their impact on eyewitness confidence. *Law and Human Behavior*, 25, 299–315. <http://dx.doi.org/10.1023/A:1010750028643>
- Gobet, F., & Simon, H. A. (1996). Templates in chess memory: A mechanism for recalling several boards. *Cognitive Psychology*, 31, 1–40. <http://dx.doi.org/10.1006/cogp.1996.0011>
- Godfrey, R. D., & Clark, S. E. (2010). Repeated eyewitness identification procedures: Memory, decision making, and probative value. *Law and Human Behavior*, 34, 241–258. <http://dx.doi.org/10.1007/s10979-009-9187-7>
- Gonzalez, R., Ellsworth, P. C., & Pembroke, M. (1993). Misidentifications and failures to identify in lineups and showups. *Journal of Personality and Social Psychology*, 64, 525–537. <http://dx.doi.org/10.1037/0022-3514.64.4.525>
- Goodsell, C. A., Neuschatz, J. S., & Gronlund, S. D. (2009). Effects of mugshot commitment on lineup performance in young and older adults. *Applied Cognitive Psychology*, 23, 788–803. <http://dx.doi.org/10.1002/acp.1512>
- Granhag, P. A., Ask, K., & MacGiolla, E. (2013). Eyewitness recall: An overview of estimator-based research. In T. J. Perfect & D. S. Lindsay (Eds.), *SAGE handbook of applied memory* (pp. 35–55). Los Angeles, CA: SAGE Publications.
- Granhag, P. A., Ask, K., Rebelius, A., Öhman, L., & MacGiolla, E. (2013). 'I saw the man who killed Anna Lindh!' An archival study of witnesses' offender descriptions. *Psychology, Crime & Law*, 19, 921–931. <http://dx.doi.org/10.1080/1068316X.2012.719620>
- Greathouse, S. M., & Kovera, M. B. (2009). Instruction bias and lineup presentation moderate the effects of administrator knowledge on eyewitness identification. *Law and Human Behavior*, 33, 70–82. <http://dx.doi.org/10.1007/s10979-008-9136-x>
- Greenberg, M. S., Westcott, D. R., & Bailey, S. E. (1998). When believing is seeing: The effect of scripts on eyewitness memory. *Law and Human Behavior*, 22, 685–694. <http://dx.doi.org/10.1023/A:1025758807624>
- Gronlund, S. D., Carlson, C. A., Neuschatz, J. S., Goodsell, C. A., Wetmore, S., Wooten, A., & Graham, M. (2012). Showups versus lineups: An evaluation using ROC analysis. *Journal of Applied Research in Memory & Cognition*, 1, 221–228. <http://dx.doi.org/10.1016/j.jarmac.2012.09.003>
- Gross, H. (1911). *Criminal psychology: A manual for judges, practitioners, and students*. Boston, MA: Little, Brown.
- Harris, M. J., & Rosenthal, R. (1985). Mediation of interpersonal expectancy effects: 31 meta-analyses. *Psychological Bulletin*, 97, 363–386. <http://dx.doi.org/10.1037/0033-2909.97.3.363>
- Haw, R. M., Dickinson, J. J., & Meissner, C. A. (2007). The phenomenology of carryover effects between show-up and line-up identification. *Memory*, 15, 117–127. <http://dx.doi.org/10.1080/09658210601171672>
- Haw, R. M., & Fisher, R. P. (2004). Effects of administrator-witness contact on eyewitness identification accuracy. *Journal of Applied Psychology*, 89, 1106–1112. <http://dx.doi.org/10.1037/0021-9010.89.6.1106>
- Hinz, T., & Pezdek, K. (2001). The effect of exposure to multiple lineups on face identification accuracy. *Law and Human Behavior*, 25, 185–198. <http://dx.doi.org/10.1023/A:1005697431830>
- Hope, L., Gabbert, F., & Fisher, R. P. (2011). From laboratory to the street: Capturing witness memory using the Self-Administered Interview. *Legal and Criminological Psychology*, 16, 211–226. <http://dx.doi.org/10.1111/j.2044-8333.2011.02015.x>
- Hope, L., Gabbert, F., Fisher, R. P., & Jamieson, K. (2014). Protecting and enhancing eyewitness memory: The impact of an initial recall attempt on performance in an investigative interview. *Applied Cognitive Psychology*, 28, 304–313. <http://dx.doi.org/10.1002/acp.2984>
- Horry, R., Halford, P., Brewer, N., Milne, R., & Bull, R. (2014). Archival analyses of eyewitness identification test outcomes: What can they tell us about eyewitness memory? *Law and Human Behavior*, 38, 94–108. <http://dx.doi.org/10.1037/h0093959>
- Horry, R., Memon, A., Wright, D. B., & Milne, R. (2012). Predictors of eyewitness identification decisions from video lineups in England: A field study. *Law and Human Behavior*, 36, 257–265. <http://dx.doi.org/10.1037/h0093959>
- Huff, R., Rattner, A., & Sagarin, E. (1986). Guilty until proven innocent. *Crime and Delinquency*, 32, 518–544. <http://dx.doi.org/10.1177/0011128786032004007>
- Innocence Project (2019). Retrieved from <https://www.innocenceproject.org/all-cases/>
- International Association of Chiefs of Police. (2016). *Model policy on eyewitness identification*. Retrieved from <https://www.theiacp.org/resources/policy-center-resource/eyewitness-identification>
- Jacoby, L. L., Woloshyn, V., & Kelley, C. (1989). Becoming famous without being recognized: Unconscious influences of memory produced by dividing attention. *Journal of Experimental Psychology: General*, 118, 115–125. <http://dx.doi.org/10.1037/0096-3445.118.2.115>
- Johnson, M. K., Hashtroudi, S., & Lindsay, D. S. (1993). Source monitoring. *Psychological Bulletin*, 114, 3–28. <http://dx.doi.org/10.1037/0033-2909.114.1.3>
- Jones, E. E., Williams, K. D., & Brewer, N. (2008). "I had a confidence epiphany!": Obstacles to combating post-identification confidence inflation. *Law and Human Behavior*, 32, 164–176. <http://dx.doi.org/10.1007/s10979-007-9101-0>
- Juslin, P., Olsson, N., & Winman, A. (1996). Calibration and diagnosticity of confidence in eyewitness identification: Comments on what can be inferred from the low confidence-accuracy correlation. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, 22, 1304–1316. <http://dx.doi.org/10.1037/0278-7393.22.5.1304>
- Kahneman, D., & Tversky, A. (1973). On the psychology of prediction. *Psychological Review*, 80, 237–251. <http://dx.doi.org/10.1037/h0034747>
- Kaminski, K. S., & Sporer, S. L. (2017). Discriminating between correct and incorrect eyewitness identifications: The use of appropriate cues.

- Journal of Experimental Psychology: Applied*, 23, 59–70. <http://dx.doi.org/10.1037/xap0000110>
- Kane, M. J., & Engle, R. W. (2000). Working-memory capacity, proactive interference, and divided attention: Limits on long-term memory retrieval. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, 26, 336–358. <http://dx.doi.org/10.1037/0278-7393.26.2.336>
- Kask, K., & Bull, R. (2009). From person descriptions to interviewing methods: What can be done to improve child witness testimonies? *Trames*, 13, 95–108. <http://dx.doi.org/10.3176/tr.2009.2.01>
- Kassin, S. M. (1998). Eyewitness identification procedures: The fifth rule. *Law and Human Behavior*, 22, 649–653. <http://dx.doi.org/10.1023/A:1025702722645>
- Kassin, S. M., Drizin, S. A., Grisso, T., Gudjonsson, G. H., Leo, R. A., & Redlich, A. D. (2010). Police-induced confessions: Risk factors and recommendations. *Law and Human Behavior*, 34, 3–38. <http://dx.doi.org/10.1007/s10979-009-9188-6>
- Kassin, S. M., Dror, I. E., & Kukucka, J. (2013). The forensic confirmation bias: Problems, perspectives, and proposed solutions. *Journal of Applied Research in Memory & Cognition*, 2, 42–52. <http://dx.doi.org/10.1016/j.jarmac.2013.01.001>
- Kassin, S. M., Kukucka, J., Lawson, V. Z., & DeCarlo, J. (2014). Does video recording alter the behavior of police during interrogation? A mock crime-and-investigation study. *Law and Human Behavior*, 38, 73–83. <http://dx.doi.org/10.1037/lhb0000047>
- Kassin, S. M., Kukucka, J., Lawson, V. Z., & DeCarlo, J. (2017). Police reports of mock suspect interrogations: A test of accuracy and perception. *Law and Human Behavior*, 41, 230–243. <http://dx.doi.org/10.1037/lhb0000225>
- Kassin, S. M., Russano, M. B., Amrom, A. D., Hellgren, J., Kukucka, J., & Lawson, V. Z. (2019). Does video recording inhibit crime suspects? Evidence from a fully randomized field experiment. *Law and Human Behavior*, 43, 45–55. <http://dx.doi.org/10.1037/lhb0000319>
- Keast, A., Brewer, N., & Wells, G. L. (2007). Children's metacognitive judgments in an eyewitness identification task. *Journal of Experimental Child Psychology*, 97, 286–314. <http://dx.doi.org/10.1016/j.jecp.2007.01.007>
- Kebbell, M. R., & Milne, R. (1998). Police officers' perceptions of eyewitness performance in forensic investigations. *The Journal of Social Psychology*, 138, 323–330. <http://dx.doi.org/10.1080/00224549809600384>
- Klayman, J., & Ha, Y. (1987). Confirmation, disconfirmation, and information in hypothesis testing. *Psychological Review*, 94, 211–228. <http://dx.doi.org/10.1037/0033-295X.94.2.211>
- Kleider, H. M., Pezdek, K., Goldinger, S. D., & Kirk, A. (2008). Schema-driven source misattribution errors: Remembering the expected from a witnessed event. *Applied Cognitive Psychology*, 22, 1–20. <http://dx.doi.org/10.1002/acp.1361>
- Klobuchar, A., Steblay, N. M., & Caligiuri, H. L. (2006). Improving eyewitness identifications: Hennepin County's blind sequential lineup pilot project. *Cardozo Public Law, Policy, and Ethics Journal*, 2, 381–414.
- Kocab, K., & Sporer, S. L. (2016). The weapon focus effect for person identifications and descriptions: A meta-analysis. In M. Miller & B. H. Bornstein (Eds.), *Advances in psychology and law* (Vol. 1, pp. 71–117). New York, NY: Springer. http://dx.doi.org/10.1007/978-3-319-29406-3_3
- Kovera, M. B., & Evelo, A. J. (2017). The case for double-blind lineup administration. *Psychology, Public Policy, and Law*, 23, 421–437. <http://dx.doi.org/10.1037/law0000139>
- Kovera, M. B., Penrod, S. D., Pappas, C., & Thill, D. L. (1997). Identification of computer-generated facial composites. *Journal of Applied Psychology*, 82, 235–246. <http://dx.doi.org/10.1037/0021-9010.82.2.235>
- Kraus, U., Zeier, F., Wagner, W., Paelecke, M., & Hewig, J. S. (2017). Comparing the quality of memory reports in different initial eyewitness questioning approaches. *Cogent Psychology*, 4, 143–163. <http://dx.doi.org/10.1080/23311908.2017.1403063>
- Lamb, M. E., Orbach, Y., Sternberg, K. J., Hershkowitz, I., & Horowitz, D. (2000). Accuracy of investigators' verbatim notes of their forensic interviews with alleged child abuse victims. *Law and Human Behavior*, 24, 699–708. <http://dx.doi.org/10.1023/A:1005556404636>
- LaRooy, D., Brubacher, S. P., Aromäki-Stratos, A., Cyr, M., Hershkowitz, I., Korkman, J., & Stewart, H. (2015). The NICHHD protocol: A review of an internationally-used evidence-based tool for training child forensic interviewers. *Journal of Criminological Research. Policy & Practice*, 1, 76–89.
- Lassiter, G. D. (2010). Psychological science and sound public policy: Video recording of custodial interrogations. *American Psychologist*, 65, 768–779. <http://dx.doi.org/10.1037/0003-066X.65.8.768>
- Lassiter, G. D., Ware, L. J., Ratcliff, J. J., & Irvin, C. R. (2009). Evidence of the camera perspective bias in authentic videotaped interrogations: Implications for emerging reform in the criminal justice system. *Legal and Criminological Psychology*, 14, 157–170. <http://dx.doi.org/10.1348/135532508X284293>
- Launay, C., & Py, J. (2015). Methods and aims of investigative interviewing of adult witnesses: An analysis of professional practices. *Pratiques Psychologiques*, 21, 55–70. <http://dx.doi.org/10.1016/j.prps.2014.11.001>
- Lawson, V. Z., & Dysart, J. E. (2014). The showup identification procedure: An exploration of systematic biases. *Legal and Criminological Psychology*, 19, 54–68. <http://dx.doi.org/10.1111/j.2044-8333.2012.02057.x>
- Levett, L. M. (2013). Co-witness information influences whether a witness is likely to choose from a lineup. *Legal and Criminological Psychology*, 18, 168–180. <http://dx.doi.org/10.1111/j.2044-8333.2011.02033.x>
- Levi, A. M. (2011). Much better than the sequential lineup: A 120-person lineup. *Psychology, Crime & Law*, 18, 631–640. <http://dx.doi.org/10.1080/1068316X.2010.526120>
- Levi, A. M., & Lindsay, R. C. L. (2001). Lineup and photo spread procedures: Issues concerning policy recommendations. *Psychology, Public Policy, and Law*, 7, 776–790. <http://dx.doi.org/10.1037/1076-8971.7.4.776>
- Lindsay, R. C., Martin, R., & Webber, L. (1994). Default values in eyewitness descriptions. *Law and Human Behavior*, 18, 527–541. <http://dx.doi.org/10.1007/BF01499172>
- Lindsay, R. C. L., Nosworthy, G. J., Martin, R., & Martynuck, C. (1994). Using mug shots to find suspects. *Journal of Applied Psychology*, 79, 121–130. <http://dx.doi.org/10.1037/0021-9010.79.1.121>
- Lindsay, R. C. L., Wallbridge, H., & Drennan, D. (1987). Do clothes make the man? An exploration of the effect of lineup attire on eyewitness identification accuracy. *Canadian Journal of Behavioural Science*, 19, 463–478. <http://dx.doi.org/10.1037/h0079998>
- Lindsay, R. C. L., & Wells, G. L. (1980). What price justice? Exploring the relationship of lineup fairness to identification accuracy. *Law and Human Behavior*, 4, 303–313. <http://dx.doi.org/10.1007/BF01040622>
- Loftus, E. F. (2004). Memories of things unseen. *Current Directions in Psychological Science*, 13, 145–147. <http://dx.doi.org/10.1111/j.0963-7214.2004.00294.x>
- Loftus, E. F. (2017). Eavesdropping on memory. *Annual Review of Psychology*, 68, 1–18. <http://dx.doi.org/10.1146/annurev-psych-010416-044138>
- Loftus, E. F., & Greene, E. (1980). Warning: Even memory for faces may be contagious. *Law and Human Behavior*, 4, 323–334. <http://dx.doi.org/10.1007/BF01040624>
- Loftus, G. R., & Harley, E. M. (2005). Why is it easier to identify someone close than far away? *Psychonomic Bulletin & Review*, 12, 43–65. <http://dx.doi.org/10.3758/BF03196348>
- Luus, C. A. E., & Wells, G. L. (1991). Eyewitness identification and the selection of distracters for lineups. *Law and Human Behavior*, 15, 43–57. <http://dx.doi.org/10.1007/BF01044829>

- Malpass, R. S. (1981). Effective size and defendant bias in eyewitness identification lineups. *Law and Human Behavior*, 5, 299–309. <http://dx.doi.org/10.1007/BF01044945>
- Malpass, R. S., & Devine, P. G. (1981). Eyewitness identification: Lineup instructions and the absence of the offender. *Journal of Applied Psychology*, 66, 482–489. <http://dx.doi.org/10.1037/0021-9010.66.4.482>
- Mandler, G. (1980). Recognizing: The judgment of previous occurrence. *Psychological Review*, 87, 252–271. <http://dx.doi.org/10.1037/0033-295X.87.3.252>
- Manson v. Braithwaite, 432 U.S. 98 (1977).
- Mansour, J. K., Beaudry, J. L., Kalmet, N., Bertrand, M. I., & Lindsay, R. C. L. (2017). Evaluating lineup fairness: Variations across methods and measures. *Law and Human Behavior*, 41, 103–115. <http://dx.doi.org/10.1037/lhb0000203>
- Matuku, K., Douglass, A. B., & Charman, S. (2018, March). A cautionary note about videotaped identification procedures. Paper presented at the annual meeting of the American Psychology-Law Society, Memphis, TN.
- McPhee, I., Paterson, H. M., & Kemp, R. I. (2014). The power of the spoken word: Can spoken recall enhance eyewitness evidence? *Psychiatry, Psychology and Law*, 21, 551–566. <http://dx.doi.org/10.1080/13218719.2013.848001>
- Mecklenburg, S. H. (2006). *Report to the legislature of the State of Illinois: The Illinois pilot program on sequential double-blind identification procedures*. Retrieved from https://www.cga.ct.gov/jud/tfs/20130901_Eyewitness%20Identification%20Task%20Force/20110921/Illinois%20ID%20Pilot%20Program.pdf
- Mecklenburg, S. H., Bailey, P. J., & Larson, M. R. (2008). The Illinois Field Study: A significant contribution to understanding real world eyewitness identification issues. *Law and Human Behavior*, 32, 22–27. <http://dx.doi.org/10.1007/s10979-007-9108-6>
- Meissner, C. A. (2002). Applied aspects of the instructional bias effect in verbal overshadowing. *Applied Cognitive Psychology*, 16, 911–928. <http://dx.doi.org/10.1002/acp.918>
- Meissner, C. A., Brigham, J. C., & Kelley, C. M. (2001). The influence of retrieval processes in verbal overshadowing. *Memory & Cognition*, 29, 176–186. <http://dx.doi.org/10.3758/BF03195751>
- Meissner, C. A., Sporer, S. L., & Schooler, J. W. (2007). Person descriptions as eyewitness evidence. In R. C. L. Lindsay, D. F. Ross, J. D. Read, & M. P. Toglia (Eds.), *Handbook of eyewitness psychology: Vol. II. Memory for people* (pp. 1–34). Mahwah, NJ: Erlbaum.
- Memon, A., Gabbert, F., & Hope, L. (2004). The ageing eyewitness. In J. Adler (Ed.), *Forensic psychology: Debates, concepts and practice* (pp. 96–112). Devon, UK: Willan.
- Memon, A., Havard, C., Clifford, B., Gabbert, F., & Watt, M. (2011). A field evaluation of the VIPER system: A new technique for eliciting eyewitness evidence. *Psychology, Crime & Law*, 17, 711–729. <http://dx.doi.org/10.1080/10683160903524333>
- Memon, A., Meissner, C. A., & Fraser, J. (2010). The Cognitive Interview: A meta-analytic review and study space analysis of the past 25 years. *Psychology, Public Policy, and Law*, 16, 340–372. <http://dx.doi.org/10.1037/a0020518>
- Mickes, L. (2015). Receiver operating analysis and confidence-accuracy characteristic analysis in investigations of system variables and estimator variables that affect eyewitness memory. *Journal of Applied Research in Memory & Cognition*, 4, 93–102. <http://dx.doi.org/10.1016/j.jarmac.2015.01.003>
- Modjadidi, K., & Kovera, M. B. (2018). Viewing videotaped identification procedure increases juror sensitivity to single-blind photo-array administration. *Law and Human Behavior*, 42, 244–257. <http://dx.doi.org/10.1037/lhb0000288>
- Molinaro, P. F., Arndorfer, A., & Charman, S. D. (2013). Appearance-change instruction effects on eyewitness lineup identification accuracy are not moderated by amount of appearance change. *Law and Human Behavior*, 37, 432–440. <http://dx.doi.org/10.1037/lhb0000049>
- Nairne, J. S. (2002). Remembering over the short-term: The case against the standard model. *Annual Review of Psychology*, 53, 53–81. <http://dx.doi.org/10.1146/annurev.psych.53.100901.135131>
- National Research Council. (2014). *Identifying the culprit: Assessing eyewitness identification*. Washington, DC: The National Academies Press. Retrieved from <https://www.nap.edu/catalog/18891/identifyingthe-culprit-assessing-eyewitness-identification>
- Neil v. Biggers, 409 U.S. 188 (1972).
- Neuschatz, J. S., Wetmore, S. A., Key, K. N., Cash, D. K., Gronlund, S. D., & Goodsell, C. A. (2016). A comprehensive evaluation of showups. In B. Bornstein & M. K. Miller (Eds.), *Advances in psychology and law* (pp. 43–69). Cham, Switzerland: Springer International Publishing. http://dx.doi.org/10.1007/978-3-319-29406-3_2
- New Jersey v. Henderson, 27 A. 3d 872 (2011).
- Newman, E. J., & Garry, M. (2013). False memory. In T. Perfect & D. S. Lindsay (Eds.), *SAGE handbook of applied memory* (pp. 110–126). Los Angeles, CA: SAGE Publications.
- Oregon v. Lawson, 352 Or. 724 (2012).
- Orfield, M. W., Jr. (1987). The exclusionary rule and deterrence: An empirical study of Chicago narcotics officers. *Chicano Law Review*, 54, 1016–1069. <http://dx.doi.org/10.2307/1599834>
- Orfield, M. W., Jr. (1992). Deterrence, perjury, and the heater factor: An exclusionary rule in the Chicago criminal courts. *University of Colorado Law Review*, 63, 75–161.
- Palmer, M. A., Brewer, N., & Weber, N. (2010). Postidentification feedback affects subsequent eyewitness identification performance. *Journal of Experimental Psychology: Applied*, 16, 387–398. <http://dx.doi.org/10.1037/a0021034>
- Palmer, M. A., Brewer, N., Weber, N., & Nagesh, A. (2013). The confidence-accuracy relationship for eyewitness identification decisions: Effects of exposure duration, retention interval, and divided attention. *Journal of Experimental Psychology: Applied*, 19, 55–71. <http://dx.doi.org/10.1037/a0031602>
- Perry v. New Hampshire, 565 U.S. 228 (2012).
- Pezdek, K., & Blandon-Gitlin, I. (2005). When is an intervening lineup most likely to affect eyewitness identification accuracy? *Legal and Criminological Psychology*, 10, 247–263. <http://dx.doi.org/10.1348/135532505X49846>
- Phillips, M. R., McAuliff, B. D., Kovera, M. B., & Cutler, B. L. (1999). Double-blind photoarray administration as a safeguard against investigator bias. *Journal of Applied Psychology*, 84, 940–951. <http://dx.doi.org/10.1037/0021-9010.84.6.940>
- Pickel, K. L. (1998). Unusualness and threat as possible causes of “weapon focus”. *Memory*, 6, 277–295. <http://dx.doi.org/10.1080/741942361>
- Pickel, K. L. (1999). The influence of context on the “weapon focus” effect. *Law and Human Behavior*, 23, 299–311. <http://dx.doi.org/10.1023/A:1022356431375>
- Police Executive Research Forum. (2013). *A national survey of eyewitness identification procedures in law enforcement agencies*. Retrieved from [http://www.policeforum.org/assets/docs/Free_Online_Documents/Eyewitness_Identification/a national survey of eyewitness identification procedures in law enforcement agencies 2013.pdf](http://www.policeforum.org/assets/docs/Free_Online_Documents/Eyewitness_Identification/a%20national%20survey%20of%20eyewitness%20identification%20procedures%20in%20law%20enforcement%20agencies%202013.pdf)
- Pryke, S., Lindsay, R. C. L., Dysart, J. E., & Dupuis, P. (2004). Multiple independent identification decisions: A method of calibrating eyewitness identifications. *Journal of Applied Psychology*, 89, 73–84. <http://dx.doi.org/10.1037/0021-9010.89.1.73>
- Quinlivan, D. S., Neuschatz, J. S., Cutler, B. L., Wells, G. L., McLung, J., & Harker, D. L. (2012). Do pre-admonition suggestions moderate the effect of unbiased lineup instructions? *Legal and Criminological Psychology*, 17, 165–176. <http://dx.doi.org/10.1348/135532510X533554>
- Ratcliff, J. J., Lassiter, G. D., Schmidt, H. C., & Snyder, C. J. (2006). Camera perspective bias in videotaped confessions: Experimental evi-

- dence of its perceptual basis. *Journal of Experimental Psychology: Applied*, 12, 197–206. <http://dx.doi.org/10.1037/1076-898X.12.4.197>
- Read, J. D., Yuille, J. C., & Tollestrup, P. (1992). Recollections of a robbery. *Law and Human Behavior*, 16, 425–446. <http://dx.doi.org/10.1007/BF02352268>
- Reardon, M. C., & Fisher, R. P. (2011). Effect of viewing the interview and identification process on juror perceptions of eyewitness accuracy. *Applied Cognitive Psychology*, 25, 68–77. <http://dx.doi.org/10.1002/acp.1643>
- Rhead, L. M., Rodriguez, D. N., Korobeynikov, V., Yip, J. H., & Kovera, M. B. (2015). The effects of lineup administrator influence and mortality salience on witness identification accuracy. *Journal of Forensic Psychology Practice*, 15, 248–274. <http://dx.doi.org/10.1080/15228932.2015.1041362>
- Rodriguez, D. N., & Berry, M. A. (2014). The effect of line-up administrator blindness on the recording of eyewitness identification decisions. *Legal and Criminological Psychology*, 19, 69–79. <http://dx.doi.org/10.1111/j.2044-8333.2012.02058.x>
- Rodriguez, D. N., & Berry, M. A. (2019). Administrator blindness affects the recording of eyewitness lineup outcomes. *Law and Human Behavior*, 44, 71–87. <http://dx.doi.org/10.1037/lhb0000352>
- Rosenthal, R. (2002). Covert communication in classrooms, clinics, courtrooms, and cubicles. *American Psychologist*, 57, 839–849. <http://dx.doi.org/10.1037/0003-066X.57.11.839>
- Ross, D. F., Ceci, S. J., Dunning, D., & Toglia, M. P. (1994). Unconscious transference and mistaken identity: When a witness misidentifies a familiar but innocent person. *Journal of Applied Psychology*, 79, 918–930. <http://dx.doi.org/10.1037/0021-9010.79.6.918>
- Satin, G. E., & Fisher, R. P. (2019). Investigative utility of the Cognitive Interview: Describing and finding perpetrators. *Law and Human Behavior*, 43, 491–506. <http://dx.doi.org/10.1037/lhb0000326>
- Sauer, J., Brewer, N., Zweck, T., & Weber, N. (2010). The effect of retention interval on the confidence-accuracy relationship for eyewitness identification. *Law and Human Behavior*, 34, 337–347. <http://dx.doi.org/10.1007/s10979-009-9192-x>
- Sauerland, M., Krix, A. C., van Kan, N., Glunz, S., & Sak, A. (2014). Speaking is silver, writing is golden? The role of cognitive and social factors in written versus spoken witness accounts. *Memory & Cognition*, 42, 978–992. <http://dx.doi.org/10.3758/s13421-014-0401-6>
- Sauerland, M., & Sporer, S. L. (2011). Written vs. spoken eyewitness accounts: Does modality of testing matter? *Behavioral Sciences & the Law*, 29, 846–857. <http://dx.doi.org/10.1002/bsl.1013>
- Scheck, B., Neufeld, P., & Dwyer, J. (2000). *Actual innocence*. New York, NY: Random House.
- Schreiber Compo, N., Carol, R. N., Evans, J. R., Pimentel, P., Holness, H., Nichols-Lopez, K., . . . Furton, K. G. (2017). Witness memory and alcohol: The effects of state-dependent recall. *Law and Human Behavior*, 41, 202–215. <http://dx.doi.org/10.1037/lhb0000224>
- Shaw, J. S., III. (1996). Increases in eyewitness confidence resulting from post-event questioning. *Journal of Experimental Psychology: Applied*, 2, 126–146. <http://dx.doi.org/10.1037/1076-898X.2.2.126>
- Shaw, J. S., III, Garven, S., & Wood, J. M. (1997). Co-witness information can have immediate effects on eyewitness memory reports. *Law and Human Behavior*, 21, 503–523. <http://dx.doi.org/10.1023/A:1024875723399>
- Shaw, J. S., III, & McClure, K. A. (1996). Repeated post-event questioning can lead to elevated levels of eyewitness confidence. *Law and Human Behavior*, 20, 629–653. <http://dx.doi.org/10.1007/BF01499235>
- Skov, R. B., & Sherman, S. J. (1986). Information-gathering processes: Diagnosticity, hypothesis-confirmatory strategies, and perceived hypothesis confirmation. *Journal of Experimental Social Psychology*, 22, 93–121. [http://dx.doi.org/10.1016/0022-1031\(86\)90031-4](http://dx.doi.org/10.1016/0022-1031(86)90031-4)
- Slobogin, C. (1996). Testifying: Police perjury and what to do about it. *University of Colorado Law Review*, 67, 1037–1060.
- Smalarz, L., Kornell, N., Vaughn, K. E., & Palmer, M. A. (2019). Identification performance from multiple lineups: Should eyewitnesses who pick fillers be burned? *Journal of Applied Research in Memory & Cognition*, 8, 221–232. <http://dx.doi.org/10.1016/j.jarmac.2019.03.001>
- Smalarz, L., & Wells, G. L. (2014a). Confirming feedback following a mistaken identification impairs memory for the culprit. *Law and Human Behavior*, 38, 283–292. <http://dx.doi.org/10.1037/lhb0000078>
- Smalarz, L., & Wells, G. L. (2014b). Post-identification feedback to eyewitnesses impairs evaluators' abilities to discriminate between accurate and mistaken testimony. *Law and Human Behavior*, 38, 194–202. <http://dx.doi.org/10.1037/lhb0000067>
- Smith, A. M., Wells, G. L., Lindsay, R. C. L., & Myerson, T. (2018). Eyewitness identification performance on showups improves with an additional-opportunities instruction: Evidence for present-absent criteria discrepancy. *Law and Human Behavior*, 42, 215–226. <http://dx.doi.org/10.1037/lhb0000284>
- Smith, A. M., Wells, G. L., Lindsay, R. C. L., & Penrod, S. D. (2017). Fair lineups are better than biased lineups and showups, but not because they increase underlying discriminability. *Law and Human Behavior*, 41, 127–145. <http://dx.doi.org/10.1037/lhb0000219>
- Smith, A. M., Wells, G. L., Smalarz, L., & Lampinen, J. M. (2018). Increasing the similarity of lineup fillers to the suspect improves applied value of lineups without improving memory performance. *Psychological Science*, 29, 1548–1551. <http://dx.doi.org/10.1177/0956797617698528>
- Smith, A. M., Wilford, M. M., Quigley-McBride, A., & Wells, G. L. (2019). Mistaken eyewitness identification rates increase when either witnessing or testing conditions get worse. *Law and Human Behavior*, 43, 358–368. <http://dx.doi.org/10.1037/lhb0000334>
- Smith-Spark, J. H., Bartimus, J., & Wilcock, R. (2017). Mental time travel ability and the Mental Reinstatement of Context for crime witnesses. *Consciousness and Cognition*, 48, 1–10. <http://dx.doi.org/10.1016/j.concog.2016.10.002>
- Snyder, M., & Swann, W. B. (1978). Hypothesis-testing processes in social interaction. *Journal of Personality and Social Psychology*, 36, 1202–1212. <http://dx.doi.org/10.1037/0022-3514.36.11.1202>
- Sporer, S. L. (1992). Post-dicting eyewitness accuracy: Confidence, decision-times and person descriptions of choosers and non-choosers. *European Journal of Social Psychology*, 22, 157–180. <http://dx.doi.org/10.1002/ejsp.2420220205>
- Sporer, S. L. (1993). Eyewitness identification accuracy, confidence and decision-times in simultaneous and sequential lineups. *Journal of Applied Psychology*, 78, 22–33. <http://dx.doi.org/10.1037/0021-9010.78.1.22>
- Sporer, S. L. (1996). Psychological aspects of person descriptions. In S. L. Sporer, R. S. Malpass, & G. Koehnken (Eds.), *Psychological issues in eyewitness identification* (pp. 53–86). Hillsdale, NJ: Erlbaum, Inc.
- State v. Lawson, 352 Or. 724, 291 P. 3d 673 (2012).
- Stebly, N. M. (1997). Social influence in eyewitness recall: A meta-analytic review of lineup instruction effects. *Law and Human Behavior*, 21, 283–297. <http://dx.doi.org/10.1023/A:1024890732059>
- Stebly, N. K. (2011). What we know now: The Evanston Illinois field lineups. *Law and Human Behavior*, 35, 1–12. <http://dx.doi.org/10.1007/s10979-009-9207-7>
- Stebly, N. K. (2013). Lineup Instructions. In B. Cutler (Ed.), *Reform of eyewitness identification procedures* (pp. 65–86). Washington, DC: APA Press. <http://dx.doi.org/10.1037/14094-004>
- Stebly, N. K., & Dysart, J. E. (2016). Repeated eyewitness identification procedures with the same suspect. *Journal of Applied Research in Memory & Cognition*, 5, 284–289. <http://dx.doi.org/10.1016/j.jarmac.2016.06.010>
- Stebly, N., Dysart, J., Fulero, S., & Lindsay, R. C. L. (2003). Eyewitness accuracy rates in police showup and lineup presentations: A meta-analytic comparison. *Law and Human Behavior*, 27, 523–540. <http://dx.doi.org/10.1023/A:1025438223608>

- Stebly, N. K., Tix, R. W., & Benson, S. L. (2013). Double exposure: The effects of repeated identification lineups on eyewitness accuracy. *Applied Cognitive Psychology*, 27, 644–654. <http://dx.doi.org/10.1002/acp.2944>
- Stebly, N., Wells, G. L., & Douglass, A. B. (2014). The eyewitness post identification feedback effect 15 years later: Theoretical and policy implications. *Psychology, Public Policy, and Law*, 20, 1–18. <http://dx.doi.org/10.1037/law0000001>
- Sternberg, K. J., Lamb, M. E., Esplin, P. W., Orbach, Y., & Hershkowitz, I. (2002). Using a structure interview protocol to improve the quality of investigative interviews. In M. Eisen (Ed.), *Memory and suggestibility in the forensic interview* (pp. 409–436). Mahwah, NJ: Erlbaum.
- Technical Working Group for Eyewitness Evidence. (1999). *Eyewitness evidence: A guide for law enforcement*. Washington, DC: U.S. Department of Justice, Office of Justice Programs.
- Tredoux, C. (1998). Statistical inference on measures of lineup fairness. *Law and Human Behavior*, 22, 217–237. <http://dx.doi.org/10.1023/A:1025746220886>
- Tredoux, C., Parker, J. F., & Nunez, D. (2007). Predicting eyewitness identification accuracy with mock witness measures of lineup fairness: Quality of encoding interacts with line up format. *South African Journal of Psychology*, 37, 207–222. <http://dx.doi.org/10.1177/008124630703700201>
- Tuckey, M. R., & Brewer, N. (2003). The influence of schemas, stimulus ambiguity, and interview schedule on eyewitness memory over time. *Journal of Experimental Psychology: Applied*, 9, 101–118. <http://dx.doi.org/10.1037/1076-898X.9.2.101>
- Tunnicliff, J. L., & Clark, S. E. (2000). Selecting foils for identification lineups: Matching suspects or descriptions? *Law and Human Behavior*, 24, 231–258. <http://dx.doi.org/10.1023/A:1005463020252>
- United States Department of Justice. (2017, January). *Eyewitness identification: Procedures for conducting photo arrays*. Memorandum for heads of department law enforcement components and all department prosecutors from Sally Yates, Deputy Attorney General, Washington, DC.
- United States v. Ash, 413 U.S. 300 (1973).
- United States vs. Wade, 388 U.S. 218, 234 (1967).
- Valentine, T., Davis, J. P., Memon, A., & Roberts, A. (2012). Live show-ups and their influence on a subsequent video lineup. *Applied Cognitive Psychology*, 26, 1–23. <http://dx.doi.org/10.1002/acp.1796>
- Valentine, T., Pickering, A., & Darling, S. (2003). Characteristics of eyewitness identification that predict the outcome of real lineups. *Applied Cognitive Psychology*, 17, 969–993. <http://dx.doi.org/10.1002/acp.939>
- Vallano, J., Steele, L. E., Slapinski, K. A., Briggs, A. P., & Pozzulo, J. D. (2019). Familiar eyewitness identifications: The current state of affairs. *Psychology, Public Policy, and Law*, 25, 128–146. <http://dx.doi.org/10.1037/law0000204>
- Van Koppen, P. J., & Lochun, S. K. (1997). Portraying perpetrators: The validity of offender descriptions by witnesses. *Law and Human Behavior*, 21, 661–685. <http://dx.doi.org/10.1023/A:1024812831576>
- Vollmer, R. T. (2006). Predictive probability of serum prostate-specific antigen for prostate cancer: An approach using Bayes rule. *American Journal of Clinical Pathology*, 125, 336–342. <http://dx.doi.org/10.1309/R5H6VUQ32KGJW448>
- Vredeveltd, A., Baddeley, A. D., & Hitch, G. J. (2012). The effects of eye-closure and “ear-closure” on recall of visual and auditory aspects of a criminal event. *Europe’s Journal of Psychology*, 8, 284–299. <http://dx.doi.org/10.5964/ejop.v8i2.472>
- Vredeveltd, A., Baddeley, A. D., & Hitch, G. J. (2014). The effectiveness of eye-closure in repeated interviews. *Legal and Criminological Psychology*, 19, 282–295. <http://dx.doi.org/10.1111/lcrp.12013>
- Vredeveltd, A., Hildebrandt, A., & van Koppen, P. J. (2016). Acknowledge, repeat, rephrase, elaborate: Witnesses can help each other remember more. *Memory*, 24, 669–682. <http://dx.doi.org/10.1080/09658211.2015.1042884>
- Wade, K. A., Nash, R. A., & Lindsay, D. S. (2018). Reasons to doubt the reliability of eyewitness memory: Commentary on Wixted, Mickes, and Fisher (2018). *Perspectives on Psychological Science*, 13, 339–342. <http://dx.doi.org/10.1177/1745691618758261>
- Wagenaar, W. A., & van der Schrier, J. H. (1996). Face recognition as a function of distance and illumination: A practical tool for use in the courtroom. *Psychology, Crime & Law*, 2, 321–332. <http://dx.doi.org/10.1080/10683169608409787>
- Walsh, D., & Bull, R. (2010). What really is effective in interviews with suspects? A study comparing interviewing skills against interviewing outcomes. *Legal and Criminological Psychology*, 15, 305–321. <http://dx.doi.org/10.1348/135532509X463356>
- Weber, N., Brewer, N., Wells, G. L., Semmler, C., & Keast, A. (2004). Eyewitness identification accuracy and response latency: The unruly 10–12-second rule. *Journal of Experimental Psychology: Applied*, 10, 139–147. <http://dx.doi.org/10.1037/1076-898X.10.3.139>
- Weber, N., & Perfect, T. J. (2012). Improving eyewitness identification accuracy by screening out those who say they don’t know. *Law and Human Behavior*, 36, 28–36. <http://dx.doi.org/10.1037/h0093976>
- Wells, G. L. (1978). Applied eyewitness testimony research: System variables and estimator variables. *Journal of Personality and Social Psychology*, 36, 1546–1557. <http://dx.doi.org/10.1037/0022-3514.36.12.1546>
- Wells, G. L. (1984). The psychology of lineup identifications. *Journal of Applied Social Psychology*, 14, 89–103. <http://dx.doi.org/10.1111/j.1559-1816.1984.tb02223.x>
- Wells, G. L. (1993). What do we know about eyewitness identification? *American Psychologist*, 48, 553–571. <http://dx.doi.org/10.1037/0003-066X.48.5.553>
- Wells, G. L. (2001). Eyewitness lineups: Data, theory, and policy. *Psychology, Public Policy, and Law*, 7, 791–801. <http://dx.doi.org/10.1037/1076-8971.7.4.791>
- Wells, G. L. (2006). Eyewitness identification: Systemic reforms. *Wisconsin Law Review*, 2006, 615–643.
- Wells, G. L., & Bradfield, A. L. (1998). “Good, you identified the suspect”: Feedback to eyewitnesses distorts their reports of the witnessing experience. *Journal of Applied Psychology*, 83, 360–376. <http://dx.doi.org/10.1037/0021-9010.83.3.360>
- Wells, G. L., & Bradfield, A. L. (1999). Measuring the goodness of lineups: Parameter estimation, question effects, and limits to the mock witness paradigm. *Applied Cognitive Psychology*, 13, 27–40.
- Wells, G. L., Leippe, M. R., & Ostrom, T. M. (1979). Guidelines for empirically assessing the fairness of a lineup. *Law and Human Behavior*, 3, 285–293. <http://dx.doi.org/10.1007/BF01039807>
- Wells, G. L., & Lindsay, R. C. L. (1980). On estimating the diagnosticity of eyewitness nonidentifications. *Psychological Bulletin*, 88, 776–784. <http://dx.doi.org/10.1037/0033-2909.88.3.776>
- Wells, G. L., & Luus, E. (1990). Police lineups as experiments: Social methodology as a framework for properly-conducted lineups. *Personality and Social Psychology Bulletin*, 16, 106–117. <http://dx.doi.org/10.1177/0146167290161008>
- Wells, G. L., & Olson, E. A. (2002). Eyewitness identification: Information gain from incriminating and exonerating behaviors. *Journal of Experimental Psychology: Applied*, 8, 155–167. <http://dx.doi.org/10.1037/1076-898X.8.3.155>
- Wells, G. L., & Quinlivan, D. S. (2009). Suggestive eyewitness identification procedures and the Supreme Court’s reliability test in light of eyewitness science: 30 years later. *Law and Human Behavior*, 33, 1–24. <http://dx.doi.org/10.1007/s10979-008-9130-3>
- Wells, G. L., Rydell, S. M., & Seelau, E. P. (1993). On the selection of distractors for eyewitness lineups. *Journal of Applied Psychology*, 78, 835–844. <http://dx.doi.org/10.1037/0021-9010.78.5.835>

- Wells, G. L., Small, M., Penrod, S. J., Malpass, R. S., Fulero, S. M., & Brimacombe, C. A. E. (1998). Eyewitness identification procedures: Recommendations for lineups and photospreads. *Law and Human Behavior*, 22, 603–647. <http://dx.doi.org/10.1023/A:1025750605807>
- Wells, G. L., Smith, A. M., & Smalarz, L. (2015). ROC analysis of lineups obscures information that is critical for both theoretical understanding and applied purposes. *Journal of Applied Research in Memory & Cognition*, 4, 324–328. <http://dx.doi.org/10.1016/j.jarmac.2015.08.010>
- Wells, G. L., Steblay, N. K., & Dysart, J. E. (2012). Eyewitness identification reforms: Are suggestiveness-induced hits and guesses true hits? *Perspectives on Psychological Science*, 7, 264–271. <http://dx.doi.org/10.1177/1745691612443368>
- Wells, G. L., Steblay, N. K., & Dysart, J. E. (2015). Double-blind photo lineups using actual eyewitnesses: An experimental test of a sequential versus simultaneous lineup procedure. *Law and Human Behavior*, 39, 1–14. <http://dx.doi.org/10.1037/lhb0000096>
- Wells, G. L., & Turtle, J. W. (1986). Eyewitness identification: The importance of lineup models. *Psychological Bulletin*, 99, 320–329. <http://dx.doi.org/10.1037/0033-2909.99.3.320>
- Wells, G. L., Yang, Y., & Smalarz, L. (2015). Eyewitness identification: Bayesian information gain, base-rate effect equivalency curves, and reasonable suspicion. *Law and Human Behavior*, 39, 99–122. <http://dx.doi.org/10.1037/lhb0000125>
- West, E., & Meterko, V. (2017). Innocence Project: DNA exonerations, 1989–2014: Review of data and findings from the first 25 years. *Albany Law Review*, 79, 717–795.
- Wetmore, S. A., Neuschatz, J. S., Gronlund, S. D., Wooten, A., Goodsell, C. A., & Carlson, C. A. (2015). Effect of retention interval on showup and lineup performance. *Journal of Applied Research in Memory & Cognition*, 4, 8–14. <http://dx.doi.org/10.1016/j.jarmac.2014.07.003>
- Wilford, M. M., & Wells, G. L. (2013). Eyewitness system variables: Revisiting the system-variable concept and the transfer of system variables to the legal system. In B. L. Cutler (Ed.), *Reform of eyewitness identification procedures* (pp. 23–43). Washington, DC: American Psychological Association. <http://dx.doi.org/10.1037/14094-002>
- Wise, R. A., Safer, M. A., & Maro, C. M. (2011). What U.S. law enforcement officers know and believe about eyewitness factors, eyewitness interviews, and identification procedures. *Applied Cognitive Psychology*, 25, 488–500. <http://dx.doi.org/10.1002/acp.1717>
- Wixted, J. T., & Mickes, L. (2014). A signal-detection-based diagnostic-feature-detection model of eyewitness identification. *Psychological Review*, 121, 262–276. <http://dx.doi.org/10.1037/a0035940>
- Wixted, J. T., Mickes, L., Dunn, J. C., Clark, S. E., & Wells, W. (2016). Estimating the reliability of eyewitness identifications from police lineups. *Proceedings of the National Academies of Science*, 113, 304–309. <http://dx.doi.org/10.1073/pnas.1516814112>
- Wixted, J. T., & Wells, G. L. (2017). The relationship between eyewitness confidence and identification accuracy: A new synthesis. *Psychological Science in the Public Interest*, 18, 10–65. <http://dx.doi.org/10.1177/1529100616686966>
- Wogalter, M. S. (1991). Effects of post-exposure description and imaging on subsequent face recognition performance. *Proceedings of the Human Factors Society*, 35, 575–579. <http://dx.doi.org/10.1518/107118191786754680>
- Wogalter, M. S. (1996). Describing faces from memory: Accuracy and effects on subsequent recognition performance. *Proceedings of the Human Factors Society*, 40, 536–540. <http://dx.doi.org/10.1177/154193129604001103>
- Wright, D. B., & McDaid, A. T. (1996). Comparing system and estimator variables using data from real lineups. *Applied Cognitive Psychology*, 10, 75–84. [http://dx.doi.org/10.1002/\(SICI\)1099-0720\(199602\)10:1<75::AID-ACP364>3.0.CO;2-E](http://dx.doi.org/10.1002/(SICI)1099-0720(199602)10:1<75::AID-ACP364>3.0.CO;2-E)
- Wright, D. B., Memon, A., Skagerberg, E. M., & Gabbert, F. (2009). When eyewitnesses talk. *Current Directions in Psychological Science*, 18, 174–178. <http://dx.doi.org/10.1111/j.1467-8721.2009.01631.x>
- Wright, D. B., & Skagerberg, E. M. (2007). Postidentification feedback affects real eyewitnesses. *Psychological Science*, 18, 172–178. <http://dx.doi.org/10.1111/j.1467-9280.2007.01868.x>
- Yarmey, A. D. (1986). Verbal, visual, and voice identification of a rape suspect under different levels of illumination. *Journal of Applied Psychology*, 71, 363–370. <http://dx.doi.org/10.1037/0021-9010.71.3.363>
- Yarmey, A. D. (2000). Retrospective duration estimations for variant and invariant events in field situations. *Applied Cognitive Psychology*, 14, 45–57. [http://dx.doi.org/10.1002/\(SICI\)1099-0720\(200001\)14:1<45::AID-ACP623>3.0.CO;2-U](http://dx.doi.org/10.1002/(SICI)1099-0720(200001)14:1<45::AID-ACP623>3.0.CO;2-U)
- Yarmey, A. D., Jacob, J., & Porter, A. (2002). Person recall in field settings. *Journal of Applied Social Psychology*, 32, 2354–2367. <http://dx.doi.org/10.1111/j.1559-1816.2002.tb01866.x>
- Yarmey, A. D., Yarmey, M. J., & Yarmey, A. L. (1996). Accuracy of eyewitness identifications in showups and lineups. *Law and Human Behavior*, 20, 459–477. <http://dx.doi.org/10.1007/BF01498981>
- Young v. Conway 715 F. 3d 79 (2d Cir. 2013).
- Yuille, J. C., & Cutshall, J. L. (1986). A case study of eyewitness memory of a crime. *Journal of Applied Psychology*, 71, 291–301. <http://dx.doi.org/10.1037/0021-9010.71.2.291>
- Yuille, J. C., & Tollestrup, P. A. (1990). Some effects of alcohol on eyewitness memory. *Journal of Applied Psychology*, 75, 268–273. <http://dx.doi.org/10.1037/0021-9010.75.3.268>
- Zajac, R., & Henderson, N. (2009). Don't it make my brown eyes blue: Co-witness misinformation about a target's appearance can impair target-absent line-up performance. *Memory*, 17, 266–278. <http://dx.doi.org/10.1080/09658210802623950>
- Zajac, R., & Karageorge, A. (2009). The wildcard: A simple technique for improving children's target-absent lineup performance. *Applied Cognitive Psychology*, 23, 358–368. <http://dx.doi.org/10.1002/acp.1511>
- Zimmerman, D. M., Chorn, J. A., Rhead, L. M., Evelo, A. J., & Kovera, M. B. (2017). Memory strength and lineup presentation moderate effects of administrator influence on mistaken identifications. *Journal of Experimental Psychology: Applied*, 23, 460–473. <http://dx.doi.org/10.1037/xap0000147>

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