Original Article

Eyewitness Confidence Does Not Necessarily Indicate Identification Accuracy

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Abstract

Eyewitness identifications are prone to error. Scholars and legal stakeholders are exploring whether and when eyewitness confidence predicts identification accuracy. Scholars agree on a strong but imperfect relationship between initial confidence and accuracy under "pristine" (ideal) conditions. However, pristine conditions are not unfailingly present in criminal cases. Even when pristine conditions are present, high confidence is not always associated with high accuracy because other factors influence the confidence–accuracy relationship. Researchers have not yet reached a consensus about the many variables that may impact the confidence–accuracy relationship. Ultimately, legal practitioners should be cautious in using confidence as an indicator of accuracy.

Keywords

eyewitness memory, eyewitness identification, lineup, confidence accuracy, pristine conditions

Tweet

Does an eyewitness's confidence indicate whether they have identified the culprit of the crime? Confidence and accuracy are related under specific conditions, but high confidence does not guarantee accuracy. More research is needed to specify when confidence indicates accuracy.

Key Points

- Confidence and accuracy have a strong relationship under certain conditions, but it is imperfect.
- Under ideal conditions, a highly confident witness is likely to have identified the culprit, but under suboptimal conditions this is not the case.
- It is unclear how often these ideal conditions occur in criminal cases.
- Confidence cannot provide definitive information about accuracy, and its ability to predict accuracy depends on a host of factors.

Eyewitness identifications can be inaccurate. Contrary to common sense, an eyewitness identification of a suspect does not guarantee that the suspect is the culprit of the crime. Eyewitness memory is prone to inaccuracies because memory is reconstructive and therefore malleable (Loftus, 2005). In fact, eyewitness misidentifications play a role in most wrongful convictions (Innocence Project, n.d.). Given that an eyewitness's accuracy is not certain, legal stakeholders have relied on eyewitness confidence to judge eyewitness reliability. Eyewitness confidence is persuasive; when an eyewitness is highly confident, their identification is more likely to lead to a guilty verdict (Boyce et al., 2007; Cutler et al., 1988; Cutler & Penrod, 1995; Key et al., 2022; Semmler et al., 2011; Slane & Dodson, 2022). In the past decade, substantial progress has been made to understand the confidence–accuracy relationship in eyewitnesses. This research initiative gained traction after Wixted and Wells's (2017) strong claim that, if police follow certain procedures, highly confident eyewitnesses are "remarkably accurate" at identifying the culprit. This claim has appeared in court (*People of the State of New York v Boone*, 2019) and been featured in news articles (e.g., Wixted & Riley, 2020). However, this claim is contingent upon ideal conditions that may not occur in most criminal cases. This review covers what is currently known about the confidence–accuracy relationship in eyewitnesses and what is not.

The Eyewitness Confidence–Accuracy Relationship

According to common sense, people know what they know, and their confidence indicates the accuracy of their memory. Despite peoples' intuitions, the confidence–accuracy relationship is not reliable in identification procedures commonly used by police. The confidence–accuracy relationship is weak

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in showups, which involve showing eyewitnesses only the suspect to determine if they can identify them (Key et al., 2015, 2017; Neuschatz et al., 2016) and strong in lineups, which involve showing an eyewitness multiple people to determine if they can identify the suspect (Wixted & Wells, 2017). For this and other reasons, scholars have recommended practitioners use lineups (Wells et al., 2020). Initial research on the confidence–accuracy relationship in lineup identifications used analyses (i.e., correlations) that underestimated the strength of the relationship (e.g., Sporer et al., 1995). To better assess this relationship, calibration analysis measures how well eyewitnesses' confidence corresponds to a group of eyewitnesses' average identification accuracy (Juslin et al., 1996). Calibration analysis includes information about all lineup choosers (i.e., identifications of the suspect and known-innocent fillers). Perfect calibration occurs when eyewitnesses' confidence (e.g., 70% confident) matches average accuracy on a lineup (e.g., 70% accurate).

Generally, laboratory studies find adult eyewitnesses have well-calibrated confidence-accuracy under pristine conditions and when eyewitness memory is not contaminated (see Sauer et al., 2019, for a review). Eyewitnesses who have low confidence in their identification tend to be inaccurate, while eyewitnesses who have high confidence in their identification tend to be accurate. However, this calibration is not perfect (e.g., eyewitnesses at confidence levels over 50% tend to be overconfident; Brewer & Wells, 2006; Palmer et al., 2013; Sauer et al., 2010) and the strength of the calibration varies by study. *Pristine conditions* involve (a) a fair lineup (i.e., suspect is not identified above chance by other people given the perpetrator's description), (b) a lineup with a single suspect, (c) double-blind administration (i.e., neither the administrator nor eyewitness knows who the suspect is), (d) instruction that the culprit may not appear in the lineup, and (e) the collection of confidence immediately after the lineup decision. These practices are critical to preserving eyewitness accuracy and confidence (Wixted & Wells, 2017). When these practices are not followed, the strength of the confidence–accuracy relationship deteriorates or is uncertain. For example, confidence reported after a delay from the lineup identification is not diagnostic of accuracy because confidence is malleable (e.g., Wixted & Wells, 2017). Calibration can also be reduced by witnessing conditions (such as long retention intervals; Palmer et al., 2013; Sauer et al., 2010) and memory contamination (such as cowitness misinformation; Levett, 2013).

While calibration adds insight to the confidence–accuracy relationship, it does not directly address the question of most interest to the court: the probability the *suspect* is guilty, based on the eyewitness's confidence. Therefore, confidence–accuracy characteristic analysis (Mickes, 2015) was introduced, which includes suspect identifications but excludes filler identifications (i.e., identifications of known-innocent persons). Reanalyzing data from 20 studies using confidence–accuracy characteristic curves, the strength of the confidence–accuracy relationship was found to be stronger than indicated by calibration analysis (Wixted & Wells, 2017). In this view, under *pristine conditions,* an eyewitness who is highly confident in their identification is very likely (i.e., 95–100%) to have identified the culprit of the crime. However, this insight may not be helpful without knowing how often eyewitnesses are "highly confident" in real cases. Many identifications made by participant-eyewitnesses are made with "medium confidence" (e.g., Mansour, 2020; Pennekamp et al., 2024; Smalarz et al., 2021), so even when high confidence indicates accuracy, applicability may be limited.

For years, eyewitness scholars have recommended pristine conditions as policy to prevent the contamination of eyewitness evidence (Wells et al., 1998, 2020). In 2017, the United States Department of Justice recommended pristine conditions (Innocence Project, 2017). However, no comprehensive information records how often pristine conditions are implemented in practice. Only 29 of 50 of the United States and the United States Federal Government have adopted any pristine conditions (Kafadar et al., 2022). Similarly, only 13% of jurisdictions worldwide recommend collecting initial confidence (Fitzgerald et al., 2021). Also unknown is when departments that have adopted pristine conditions follow and meet pristine conditions in practice. Police face barriers to implementing pristine conditions, such as lack of training, performance pressures (e.g., risk of guilty persons not convicted, inadmissibility of evidence), and lack of resources (e.g., expansive face databases that are needed to create fair lineups). The recommendation to conduct fair lineups has been in place since at least 1999 (National Institute of Justice, 1999), and yet, Steblay and Wells (2020) found that 41% of a sample of real police lineups (from Wells et al., 2015) were "significantly biased against the suspect" (p. 397). Of note, these lineups were provided by departments in which police were knowledgeable about how to construct a fair lineup. Surveys find that, in many instances, police do not collect initial confidence or do not conduct double-blind lineups (Police Executive Research Forum, 2013). In short, the information available suggests that pristine conditions are not readily implemented, which limits the ability to apply findings from research to criminal cases.

Additional factors narrow the conditions in which high confidence indicates high accuracy (Berkowitz & Frenda, 2018; Berkowitz et al., 2022a, 2022b; Colloff et al., 2017; Fitzgerald et al., 2023; Giacona et al., 2021; Grabman et al., 2019; Kovera & Evelo, 2021; Lin et al., 2019; Lockamyeir et al., 2020; Sauer et al., 2019; Winsor et al., 2021). High confidence-accuracy rates are affected by base rates, or how often lineups contain the perpetrator of the crime (Smith et al., 2021). High confidence-accuracy rates are lower when correcting for lineup bias (Fitzgerald et al., 2023). Conclusions about confidence-accuracy, which are made at the group level, may not reflect confidence-accuracy at the individual level (Sauer et al., 2019). These

conditionalities to the high-confidence–accuracy relationship limit its usefulness to legal stakeholders.

Confidence: Lost in Translation

In practice, confidence (when obtained) is typically collected in the eyewitness's own words. In research, confidence is typically collected on a numerical scale. Researchers systematically categorize confidence (e.g., on a 0–100% scale; low, medium, high; or by using machine learning approaches, e.g., Greenspan et al., 2024; Seale-Carlisle et al., 2022). Interpreting the meaning of an eyewitness's confidence is not simple. Eyewitnesses say many things when asked for confidence "in their own words," and interpretations of confidence statements vary too, even for phrases such as "completely certain," "confident," or "high confidence" (e.g., Greenspan & Loftus, 2023; Mansour, 2020; Pennekamp et al., 2024; Pennekamp & Mansour, 2024). For research to inform the interpretation of confidence in practice would require a standardized protocol —aligned with methods used in research. Without such a protocol in place, it is not possible to apply research findings on the confidence–accuracy relationship to practice.

Memory Contamination

Memory contamination is another variable that influences confidence–accuracy in eyewitnesses that Wixted and Wells (2017) did not fully account for (Eisen et al., 2020; Kovera & Evelo, 2021). Memory contamination refers to changes in an eyewitness's memory of the event (or their confidence) due to external or internal influences. The recommendation to conduct lineups double-blind and to collect confidence following identifications is motivated, in part, to prevent memory contamination (Wixted & Wells, 2017). For example, eyewitness confidence can be contaminated by the anticipation of being cross-examined (Wells et al., 1981) and by postidentification feedback (see Steblay et al., 2014 for review).

Eyewitnesses' memory can also be contaminated *before* the lineup procedure (e.g., by cowitnesses, police, researching the case, or news), and the pristine conditions hypothesis does not account for such contamination. For example, a cowitness conveying misinformation about the perpetrator can affect eyewitness decision making (Eisen et al., 2017a; Levett, 2013; Zajac et al., 2016; Zajac & Henderson, 2009). Similarly, information about a cowitness's or informant's identification can affect confidence (Erickson et al., 2016; Levett, 2013; Mote et al., 2018; Semmler et al., 2004). Implicit or explicit suggestions about the appearance of the suspect, the likelihood that the perpetrator may be present in the lineup, and how well the eyewitness is expected to perform have the potential to influence an eyewitness's identification decision and confidence. These types of suggestions are not limited to interpersonal interactions. Exposure to a suspect's photograph before the identification procedure harms eyewitness identification decisions and confidence (Deffenbacher et al., 2006; Kruisselbrink et al., 2023), whether the eyewitness was exposed to the photograph by police (such as a mugshot) or through their own research (e.g., social media or a photograph shared by an acquaintance). This is problematic because research on pre-lineup effects on the confidence–accuracy relationship is scarce. The proliferation of online platforms provides eyewitnesses with access to information, making it difficult for police to account for such exposures. Research has yet to conclude how these factors influence high-confidence identification accuracy.

Estimator Variables

Under the Wixted and Wells (2017) pristine conditions hypothesis, variables about the crime and eyewitness that police can only approximate (known as *estimator variables,* e.g., the age or race of eyewitness and culprit, exposure duration, lighting) may not affect the finding that a highly confident eyewitness is likely to be accurate. Some research supports this (Carlson et al., 2017; Semmler et al., 2018), while other research does not (Giacona et al., 2021; Grabman et al., 2019; Lin et al., 2019; Lockamyeir et al., 2020; Semmler et al., 2018; Winsor et al., 2021). Highly confident eyewitnesses were highly accurate at viewing distances of 3 m and 10 m, but not 20 m (Lockamyeir et al., 2020). Highly confident eyewitnesses were not highly accurate when they had poor face recognition ability, made an identification decision slowly, or made decisions based on familiarity (Grabman et al., 2019). Highly confident eyewitnesses were not highly accurate when they were faced with multiple poor estimator variables (i.e., distance, view of external features, weapon presence, exposure duration, retention interval, and stress; Giacona et al., 2021). Highly confident eyewitnesses were highly accurate after a 10-min delay between the crime and lineup, but not after a 3-day delay (Lin et al., 2019). Notably, most research studies use such short delays. This finding suggests that highly confident eyewitnesses are not likely to be highly accurate under a delay that is more realistic for conducting a lineup in practice (e.g., 3 days vs. 10 min). Four- to nine-year-old children were not highly accurate when highly confident but 10- to 17-year-olds were (Winsor et al., 2021). Adults above the age of 30 were not highly accurate when highly confident but younger adults were (Colloff et al., 2017). These findings about confidence and accuracy when some estimator variables are suboptimal contradict the pristine conditions hypothesis. High-confidence identifications are not necessarily accurate, and research is far from being able to specify exactly when high-confidence identifications do indicate high accuracy.

The Pressure an Eyewitness Faces

Arguably, confidence judgments and lineup decisions are more important to eyewitnesses than to academic research participants, given the potential consequences. Eyewitnesses may be highly motivated to identify a culprit and thus more willing to make high-confidence identification than research participants. Given the effort required for law enforcement to administer a lineup, eyewitnesses may assume that the culprit is likely to be present in the lineup to a greater extent than they would in research. Eyewitnesses' expectations about the likelihood of a culprit's presence influence their willingness to make identification (Brewer & Wells, 2006). Research using more realistic witnessing conditions than typical laboratory studies finds that eyewitnesses are *more* likely to identify someone and are *less* accurate than in the laboratory (Eisen et al., 2017b; Foster et al., 1994; Nyman et al., 2020). Participants who thought they were part of a criminal case were *more* overconfident than participants who thought they were in a research study (Eisen et al., 2017b). Before drawing conclusions about the confidence–accuracy relationship in the real world, more research needs to examine eyewitness confidence and accuracy using realistic contexts.

Policy Recommendations

Eyewitness identification researchers generally agree on a relationship between confidence and accuracy in laboratory research, but this relationship is imperfect. Motivated to test the Wixted and Wells (2017) claim that high confidence identifications are remarkably accurate under pristine conditions, emerging research identifies boundary conditions and caveats. Even under optimal laboratory conditions, a high-confidence eyewitness is not necessarily accurate (Fitzgerald et al., 2023; Sauer et al., 2019; Smith et al., 2021). When researchers create conditions that mimic real-life witnessing conditions (e.g., delays, imperfect lineups), the confidence–accuracy relationship is weaker. Confidence has the potential to provide additional information about eyewitness accuracy, but the factors of the case should be carefully examined to determine the usefulness of confidence. More research is needed—particularly under conditions that mirror reality—to draw conclusions about the extent to which a confidence–accuracy relationship exists in the real world.

Lineup Procedures to Prevent Contaminating Eyewitness Memory and Confidence

To be able to rely on eyewitness identification research, practitioners must follow evidence-based practices. Specifically, practitioners should follow pristine conditions (as discussed above) when administering lineups and avoid contaminating eyewitness memory and confidence. It is critical that practitioners know that the violation of these conditions would undermine the strength of the confidence–accuracy relationship, and that even when these conditions are met, high-confidence identifications do not necessarily indicate likely accuracy (see Fitzgerald et al., 2023; Sauer et al., 2019; Smith et al., 2021). Practitioners can avoid contaminating eyewitness memory by not exposing eyewitnesses to implicit or explicit suggestions about the suspect or the eyewitness's reliability before, during, or after the lineup administration. Practitioners should assess the extent to which eyewitnesses were exposed to information about the case that could affect their reliability. If an eyewitness was exposed to information about the case their confidence should be regarded as less reliable. Lastly, practitioners should take stock of the conditions of estimator variables in each case (e.g., was the identification cross-race?). Following these procedures is a first step to preventing the contamination of eyewitness testimony and being able to draw conclusions about confidence from accuracy. We caution practitioners not to conclude that high confidence is indicative of accuracy. Gaps between research and practice need to be bridged before conclusions can be drawn about the usefulness of confidence to determine the reliability of an eyewitness decision.

Education of Legal Stakeholders

Lawyers, judges, and juries need to know the current state of the literature on the confidence–accuracy relationship in eyewitnesses before invoking eyewitness confidence as evidence. Legal stakeholders should be aware that confidence and accuracy can be related, but that the strength of this relationship depends on factors including lineup procedures, witnessing conditions (i.e., estimator variables), and the base rates of culprits in lineups, memory contamination, and the measurement of confidence. However, it remains an empirical question to what extent education allows people to correct for the intuition that confidence is an indicator of accuracy. Sauerland and Otgaar (2022) found that people updated their beliefs about memory from a course on eyewitness memory. Expert witnesses can help legal stakeholders understand the state of research as it applies to the specifics of a case, especially when aforementioned variables are at play. Expert witness testimony can increase a juror's knowledge and ability to account for factors that affect eyewitness memory (Cutler et al., 1989; Devenport et al., 2002), but there are limitations (Devenport et al., 2002). In short, being aware of the evidence on the confidence–accuracy relationship could help legal stakeholders in handling confidence evidence.

Research–Practice Collaboration

To move research toward generating helpful conclusions about eyewitness evidence, it would be advantageous for research scholars and legal practitioners to work together to design realistic research studies. Researcher–practitioner

collaborations would enable both parties to understand the unique challenges each face to move toward developing solutions.

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