Abstract

Psychological researchers have brought a scientific understanding to the collection of eyewitness evidence, and have proposed a variety of recommendations designed to improve its reliability. However, such procedures can only be implemented through successful collaboration between researchers and law enforcement personnel. Research and development units are rare within North American law enforcement organizations. This article outlines areas of eyewitness memory and identification in which both academic research and law enforcement procedure and training would benefit from collaborative relationships. We outline some of the more central findings of the scientific study of memory applied to eyewitnesses. Both application of this knowledge and sharpening of the questions needing further study would benefit from collaborative activities.
Eyewitness accounts of crime events give investigators a view of crimes and perpetrators to which they would have otherwise very limited access. Eyewitness information, including descriptions and identifications, frequently guides the course of investigations and can lead to the identification of criminal perpetrators. Eyewitness accounts remain useful throughout the trial process, as convictions often hinge on eyewitness information gathered during the investigation and later presented in court. As a result, eyewitness evidence is an important part of any investigative process. Unfortunately, the source of this evidence - human memory - can be quite fallible, and the things people recall and report to others can be inaccurate and incomplete (Loftus, Miller & Burns, 1978; Sporer, 1996). Eyewitnesses cannot play back memories as if replaying a video tape, and therefore, eyewitness reports should not automatically be considered a highly accurate account of the actual event. To make matters more complicated, eyewitness evidence can be contaminated at a number of points in the investigative process (Sandoval, 2003). For instance, overheard co-witness information or investigator comments and questions are known to alter witnesses’ original memories of an event.

Yet despite the importance of eyewitness memory evidence and the potential usefulness of research findings on eyewitness memory, the development of effective law enforcement evidence gathering and preservation procedures for eyewitness evidence has been concentrated in university settings rather than in law enforcement research and development units (Geller, 1997). This is particularly true in the U.S., somewhat less so in Canada and considerably less so in the UK, where research and development functions reside in the Home Office itself (see, for example, Kebbell & Wagstaff, 1999). Even training in basic techniques is uneven and rarely emerges from research-based programs (Wogalter, Malpass, & McQuiston, 2004). Bringing scientists and practitioners together produced very positive results in the case of the U.S. Department of Justice (1999) technical working group on eyewitness evidence, and there is every reason to think that collaborative relationships can work to produce mutually beneficial increments in knowledge.

Eyewitnesses are typically unaware of memory errors or contamination by factors occurring after the event. Thus, they may confidently report what they remember and remain confident when they identify the perpetrator despite certain outside influences that have undermined the reliability of their memory (Sporer, Penrod, Read, & Cutler, 1995). Such a process has led to numerous erroneous eyewitness identifications that have resulted in the wrongful conviction of legally innocent persons (Scheck, Neufeld, & Dwyer, 2001). The Innocence Project reports that evidence based on eyewitness memory is the single most frequent factor associated with wrongful conviction. This finding highlights the importance of improving the reliability of eyewitness accounts. An understanding of the factors that influence eyewitness memory and the development of procedures and policies that might enhance eyewitness accuracy will both minimize the costs to innocent suspects and increase the likelihood that perpetrators are convicted.

Psychological scientists have studied many of the procedural issues involved in gathering eyewitness descriptions and identifications and are in a position to make practical recommendations that may improve the effectiveness of law enforcement procedures. While much of the knowledge gained by psychological researchers has remained outside the
criminal justice system, psychological theory and research provides an understanding of both the memory processes and the social dynamics encountered by eyewitnesses during an investigation. The criminal justice system in general, and law enforcement agencies in particular, would benefit from developing, updating, and improving procedures and safeguards for collecting eyewitness evidence, just as they do in other areas of evidence collection. Most research in this area is presently conducted at universities, but research programs can be successfully brought into law enforcement agencies, making it possible for researchers and police personnel to work together toward a common goal of streamlining eyewitness evidence collection procedures and increasing the forensic value and reliability of the eyewitness evidence.

The purpose of this article is to discuss recent findings from psychological research on eyewitness memory and behavioral processes, and to demonstrate the potential for integration of these findings with law enforcement investigative activities. First, we present a brief summary of scientific research methods that have led to the current state of knowledge, followed by a discussion of recent research findings and research-based recommendations. Finally, the implications and potential benefits of bringing together scientific researchers and law enforcement personnel to share information and development scientifically established and legally relevant procedures is discussed.

The Scientific Method

The science behind eyewitness identification and memory processes comes from psychological theories based in disciplines such as social psychology (which focuses on how others influence our thoughts and behaviors), cognitive psychology (which focuses on memory and decision-making processes), and developmental psychology (which focuses on social, physical, and intellectual changes across the lifespan). Applied psychology uses empirical evidence and theories from basic discipline areas in psychology (such as those described above) and applies them to real-world issues.

At the heart of psychological research is the scientific method, which is used in an effort to better understand the factors governing human behavior. The scientific method is used in many academic areas as diverse as psychology, biology and chemistry as well as in applied areas such as in clinical trials of prescription drugs, and crash testing of motor vehicles. There are two important stages to the scientific process. The first is discovery. Like law enforcement investigators, scientists observe events or objects that need explanation. Then, they develop a series of plausible explanations, or hypotheses. Hypotheses developed in this way are accepted as valid only when they have survived the second part of the scientific process – empirical verification. It is this second phase in which rigorous research methods come into play. The procedures used to process criminal evidence (e.g., blood, DNA, and eyewitness memory) are the product of research that specifies both the collection of materials and the processes by which they are analyzed and evaluated. Through the systematic analysis of factors believed to play a role in eyewitness events, the basic processes governing witness memory, perception, and reactions can be better understood.

For example, twenty-five years ago, research revealed that the instructions given to eyewitnesses prior to their attempts at lineup identification have a strong effect on the willingness of witnesses to choose someone from a lineup (Malpass & Devine, 1981a). The main effect of administering certain instructions (e.g. that the perpetrator may not be present) was to reduce the rate of
false identifications in lineups where the actual offender was not present (Steblay, 1997). Experiments confirming these results led to recommendations that witnesses be given a series of instructions before participating in an identification procedure (some are mentioned below). Many law enforcement organizations specifically mention them in their policy and procedure manuals, and they are recommended in the NIJ Guide for Law Enforcement on Eyewitness Evidence (U.S. Department of Justice, 1999).

By relying on relevant theory, scientific reasoning, and experimental data, the results found in research settings can be used to understand procedures that might counter the detrimental effects of some psychological processes and ultimately improve the reliability of eyewitness accounts in field settings. Similar incorporation of psychological data with police procedures has been made in the area of officer-involved shootings (Artwohl, 2002; Pinizzotto, Kern, & Davis, 2004). While many procedures for collecting memory evidence have been tested under both laboratory and simulated field conditions, it is important that police officers play a role in their ultimate application to everyday investigative procedure. Thus, collaboration between researchers and field investigators is essential to ultimately improving procedures that will be effective in preserving the integrity of eyewitness reports. Ultimately, the only knowledge scientists recommend for application to real-world law enforcement investigation is knowledge that has been verified empirically.

Below we present a brief review of current research findings from the laboratory in the context of procedural recommendations for the collection of eyewitness evidence.

**Research Findings and Recommendations**

Scientific research into basic memory processes has been a central part of psychology for over 120 years, with Ebbinghaus first studying forgetting in 1885. The study of eyewitness memory has been around for almost as long (Munsterberg, 1908; Stern, 1903; Whipple, 1909). Eyewitness memory research has provided an extensive understanding of the variety of factors that can influence the accuracy of descriptions and of identification decisions provided by witnesses. These research findings form the foundation of knowledge that psychologists use to advocate novel investigative procedures for the collection of eyewitness evidence, and that psychological experts use to testify about in court. Based on this well-grounded body of work, a variety of recommendations have been made by researchers over the years.

Eyewitness memory can be thought of as trace evidence, much like blood, fiber, or fingerprints. Trace evidence must be carefully collected and preserved in order for it to be useful during trial. When there is doubt about the collection or preservation of trace evidence, its probative value diminishes. This is true whether the trace evidence is blood or memory, and thus the same care should be taken with memory evidence as is given to other forms of trace evidence. Memories can be contaminated at many points in the criminal justice timeline, from immediately following an event to the latest in a series of attempts to remember and report about the incident. For this reason certain procedures should be put into place to protect a witness’s memory against contamination during the evidence collection process. Just as law enforcement officers are trained and updated on the most efficient DNA evidence collection and preservation procedures based upon advances in the biological and chemical sciences, they can also be informed about procedures that reflect improved methods of
preserving memory evidence collection based on the latest psychological research. Use of such procedures will protect the integrity of the evidence and reduce doubts regarding the veracity of the information gained.

The procedures we recommend below are based on a review of current psychological literature and on two guides developed for law enforcement agencies by the National Institute for Justice (U.S. Department of Justice, 1999; U.S. Department of Justice, 2003), and are generally accepted in the field. They are also the basis for policies on eyewitness identification procedures in New Jersey and Wisconsin. Summarizing this information provides several scientifically based recommendations that focus on both estimator variables and system variables (Wells, 1978). Estimator variables are those variables that may affect memory at the time of the crime or relate to individual characteristics, but that are not able to be controlled and thus their impact on memory can only be estimated (i.e., race of the perpetrator, poor viewing conditions, age of the witness; Wells, 1978). System variables are procedures that are under the control of law enforcement (i.e., interview techniques, lineup construction). Understanding the contributions of both types of variables provides an opportunity to evaluate the strength of the witness’s memory and to implement procedures that might best capture the memory in a reliable form.

Estimator Variables

It is important to evaluate certain conditions that may influence the quality of a witness’s report. Although little can be done to control for such pre-existing conditions, the information gained by determining witness and crime scene characteristics can aid investigators in estimating the quality and potential accuracy of witness accounts. Below are suggestions for evaluating eyewitness memory based upon the variety of estimator variables that researchers have examined.

**Determine if a weapon was used** – The presence of a threatening weapon can draw attention away from the face of the perpetrator and towards the weapon. Research has demonstrated that the presence of a threatening object has the capacity to decrease recognition of the face and to impair a witness’s ability to describe the perpetrator (Steblay, 1992). There is no precise test for this effect, but detailed witness descriptions of the weapon may indicate attention to the object.

**Determine if the witness was under a high level of stress during the event and at what point the stress occurred** – While the verdict is still not in on the full effects of stress on eyewitness memory, it is generally agreed that higher levels of stress reduce eyewitness identifications of the target person and memory for the details associated with a crime (Deffenbacher, et al., 2004).

**Make note of the race of the perpetrator and the race of the witnesses** – When identification is across racial groups, recognition can be impaired. People tend not to be able to recognize people of other races as well as they recognize people of their own race; instead, they mistakenly identify another face (Meissner & Brigham, 2001). On the average, White Americans, for example, make about 50% more identification errors for Black faces compared with White faces. The cross-race effect has been demonstrated across many different races and ethnic groups. It is important to determine early in the investigation if cross-race effects may hinder future identifications and require special care in constructing a lineup.
Determine how much time has passed since the crime – The longer the delay between the observation and the recall of information or identification of the perpetrator, the more opportunity there is for the memory trace to decay (Shepherd, 1983) or to be contaminated by post-event information, such as comments from other witnesses or media coverage of the event (Jenkins, 1985).

Evaluate and make note of factors that might affect a witness’s opportunity to view the perpetrator. This will assist in objectively assessing the strength of the witness’s memory for the perpetrator. Factors to consider regarding the witness’s opportunity to view include:

- The amount of time the witness was able to look at the perpetrator (Behrman & Davey, 2001; Shapiro & Penrod, 1986). Be mindful that people sometimes have difficulty judging the passage of time. Ask the witness if there was anything else going on that would help to judge the span of time (such as the time it took to walk from one place to another).

- The amount of time spent looking at the perpetrator’s face compared to other features such as clothing or hands. Did the witness intentionally study the face of the perpetrator? Research indicates that intentional studying of a face can enhance the witness’s memory for that face (Cutler, Penrod, & Martens, 1987).

- The angle at which the witness viewed the perpetrator’s face. Some views provide more information about a face than others (Bruce, Valentine, & Baddley, 1987).

- The viewing distance. The further away a person is, the less detail they will be able to see.

- The level of overall lighting. If the lights are too bright or too dim, detail can be lost. Research indicates that shape from shadows can be an important factor in facial identification (Bruce & Langston, 1994). Such information should be obtained at the scene since it may be difficult to reconstruct later on.

- The location of the light source. When people are lit from the front, the witness will get a better view of the face. In cases when the perpetrator is backlit, the view can be diminished to a silhouette.

- The witness’s eyesight ability. Find out if he or she wears glasses, and the magnitude of the prescription. Ask if he or she was wearing them at the time and when the prescription was last checked and updated.

Questions directed to the witness regarding their observation of the scene, event and perpetrator should occur prior to being shown a lineup, as their perception of being “right” or “wrong” in the lineup identification can impact the accounts of other aspects of their observations (Wells & Bradfield, 1998).

System Variables

System variables deal with investigative procedures, and are under the direct control of law enforcement personnel. These recommendations are designed explicitly to reduce memory contamination during the evidence collection process. Below are recommendations for three different stages of investigative procedure, including the initial interview of witnesses, construction of the lineup, and lineup administration. These recommendations are not exhaustive.

Procedures to consider when interviewing the witness:

Separate multiple witnesses to guard against social influence and contamination – Discourage witnesses from speaking to one another or to others in the area
(family, friends, media, etc.) until an officer has had the opportunity to interview them.

Establish rapport - Witnessing a crime event is traumatic and confusing, and speaking with police officers can be very intimidating or may produce resistance. Building rapport breaks down resistance, puts witnesses at ease, and is perceived to be useful in encouraging correct recall (Fisher, 1995; Fisher & Geiselman, 1992; Kebbell, Milne, & Wagstaff, 1999).

Ask open-ended questions such as “Please tell me what you witnessed from the very beginning of the incident to the very end,” and avoid interrupting the witness as he or she speaks – Allowing the witness to speak freely about the experience enables the witness to provide an uninhibited record of the memory for the event and/or perpetrator and may produce information that the officer may not have thought to probe for (Fisher, Geiselman, & Raymond, 1987).

Avoid asking leading questions or suggesting to witnesses certain characteristics of the event or perpetrator that they have not previously provided in their open-ended response – Questions containing an answer (Was the car red?), provide suggestive information to the witness and may contaminate memory. This new information may later become a false memory for the witness (Fisher, 1995; Fisher & Geiselman, 1992; Loftus, et al., 1978).

Caution witnesses against guessing – This reduces the likelihood that witnesses will report incorrect information that may hinder the investigation and waste officers’ time.

Procedures to consider when constructing the lineup:

Simultaneous or Sequential? Research has indicated that sequential lineups reduce false identifications when the actual perpetrator is absent from the lineup (Lindsay & Wells, 1985; Steblay, Dysart, Fulero, & Lindsay, 2001), a factor significant enough for policy makers in Wisconsin and New Jersey to
adopt versions of the sequential lineup procedure for their jurisdictions. However, the sequential lineup also appears to lower the rate of correct identifications (Steblay, et. al., 2001). Researchers are actively working to uncover the mechanisms that underlie this effect (e.g., Meissner, Tredoux, Parker, & MacLin, 2005). The U.S. Department of Justice (1999) provides guidelines for constructing both types of lineups.

**Place only one suspect in a lineup** – A mistaken witness will falsely identify an innocent suspect 1 out of 6 times in a 6-person lineup. If two innocent suspects are present in the lineup, the likelihood of a witness without a good memory for the individuals choosing an innocent suspect goes up to 1 in 3. If multiple suspects exist, create a new lineup around each suspect (U.S. Department of Justice, 1999; Wells, Small, Penrod, Malpass, Fulero, & Brimacombe, 1998).

**Place fillers in the lineup that match the verbal description provided by the witness** – This avoids the problem of choosing fillers by matching them to the suspect’s appearance which has been shown to be suggestive (Clark & Tunnicliff, 2001; Wogalter, Marwitz, & Leonard, 1992). However, this may not always be possible because some verbal descriptions have only minimal information. Consequently, the lineup may need to be constructed taking into consideration the suspect’s appearance. If this is done, then ensure that the suspect does not unduly stand out (U.S. Department of Justice, 1999).

**Attempt to create a “reasonable” test of the witness’s memory** – Don’t make the lineup too difficult (i.e., lineup members should not be “dead ringers” of one another) or too easy (i.e., lineup members of different races, ages, and overall appearance). Rather, lineup members should be reasonably similar to one another to provide a fair test of the witness’s memory (Malpass, Tredoux, & McQuiston-Surrett, in press; Wells, et al., 1998). A lineup is considered unfair if an individual who did not witness the crime is still able to pick the suspect from the lineup (Malpass & Lindsay, 1999).

**Select a person to construct the lineup that is of the same racial/ethnic background as the suspect** – Just as the cross-race deficit can influence a witness’s memory, it can also influence one’s ability to perceptually distinguish between other-race members (Brigham & Ready, 1985; Meissner & Brigham, 2001; Mitchell, 2005). An officer of the same race as the perpetrator will be better able to construct a lineup that will provide a fair and reasonable test of the witness’s memory.

**Procedures to consider when administering the lineup:**

**Prior to identification, instruct the witness** that a) the perpetrator may or may not be present, b) it is okay for the witness to respond that they “don’t know” or are “not sure” whether someone resembles the suspect, c) it is just as important to clear an innocent person as it is to identify a guilty one, d) just because they are being shown a lineup does not mean that the offender is present, and e) they are not obligated to identify anyone from the lineup. Such instructions have been shown to reduce the likelihood that a witness will respond by guessing, and are among those recommended by various law enforcement agencies (U.S. Department of Justice, 1999).

**Obtain and document a statement of confidence by the witness immediately following their identification decision** – This will provide an objective record of
the witness’s certainty that is uninfluenced by subsequent information the witness may receive, and will ensure a pure statement of certainty that can be presented at trial as post-event information has been demonstrated to inflate a witness’s confidence (U.S. Department of Justice, 1999; Wells & Bradfield, 1998).

Avoid providing feedback to the witness about his or her choice – Positive feedback can inflate a witness’s statements of confidence and perceptions of their memory for the event or perpetrator (Loftus, et al., 1978; Wells & Bradfield, 1998). Ideally, the officer administering the lineup should not know which lineup member is the suspect (Bradfield, Wells, & Olson, 2002; Wells, Olson, & Charman, 2003). This avoids any problem with the officer providing inadvertent feedback.

Videotape live lineups and document all photographic lineups with dates and signatures – This will provide an objective record of the lineup that will demonstrate attempts to generate a fair and reasonable test of the witness’s memory. At minimum, photograph the lineup before and after the identification procedure.

Implications for Law Enforcement

The most potentially beneficial implication is that law enforcement officers are able to validate existing procedures (or modify/develop new procedures) that lead to accurate identifications and procedures that withstand scrutiny at trial. To this end, it is our hope that law enforcement personnel might incorporate scientifically based procedures into their everyday investigative processes.

Police administrators are also encouraged to seek collaboration with researchers in developing “field tests” of novel investigative procedures, and to collaborate with researchers to assess the potential effectiveness of new policies prior to implementation. We firmly believe that feedback from the field and a collaborative relationship with law enforcement are essential to the development of procedures that will maximize the reliability of eyewitness evidence. The National Institute of Justice, the courts, and attorneys are placing great emphasis on the procedures that investigators use to collect eyewitness evidence. It is important that law enforcement administrators consider implementing research-based procedures, that research-based training programs are provided to officers who may interview witnesses in the field or subsequently obtain lineup identifications, and that collaborative efforts between law enforcement personnel and researchers are fostered.

Implications for Researchers

Eyewitness researchers benefit from a cooperative relationship with law enforcement by gaining understanding of real world constraints that law enforcement personnel are under and the practical considerations of implementing various recommendations. New (and important) research ideas can be generated through discussions with the very people who are engaged in these practices day to day. Their knowledge of what really happens in the field is invaluable. In turn, researchers can provide law enforcement with information and suggest procedures that will contribute to effective investigation practices and streamline memory evidence collection techniques.

Researchers are frequently called into courtrooms to present research on many eyewitness topics. It is through this testimony that scientific information currently makes its way into the legal system. Often in these cases, police procedures are under intense scrutiny, and an expert’s highlighting of police “mistakes”
can become a focal point for the defense. Disseminating this information to law enforcement officials well before reaching the courtroom provides proactive implementation of procedures that will prevent memory contamination and thus strengthen cases against perpetrators of crime.

Implications for Collaborative Efforts

By working together, law enforcement agencies and eyewitness researchers can construct training programs that will not only inform police officers of the most useful eyewitness evidence collection techniques and update them on new findings, but also provide police officers background information to understand why the procedures are useful and important. An open dialogue and ongoing conversation between researchers and law enforcement will ensure that the most up-to-date and appropriate procedures are used. Many researchers in the field provide expenses-only consulting to law enforcement agencies, including the authors of the present article. For example, current efforts include developing eyewitness identification software for the Waterloo, Iowa Police Department that is specific to their policies, as well as training programs for the El Paso County Sheriff’s Academy. Law enforcement administrators are encouraged to contact researchers in their area to initiate the collaboration process.

Training sessions, seminars, brief formal talks, software development and informal communication are ways in which researchers are able to provide assistance. The NIJ Training Manual, released by the U.S. Department of Justice, introduces lesson plans that can be used in existing training programs or as stand-alone classes (U.S. Department of Justice, 2003). This manual not only provides structure for teaching eyewitness interview and identification techniques, but also provides the context for understanding why certain procedures are recommended. This training manual was the product of a collaboration between police officers, psychological researchers, and both prosecutors and defense attorneys, and its application to investigative training is highly recommended.

Conclusion

Psychological researchers have brought a scientific understanding to the collection of eyewitness evidence, and have proposed a variety of recommendations that are designed to increase its reliability. However, such procedures can only be implemented through successful collaboration between researchers and law enforcement personnel. It is hoped that the present article will serve to provide field investigators with the state of the current science on eyewitness evidence, and encourage an open dialogue between researchers and law enforcement that might lead to the development of field tests, training programs, and the implementation of scientifically validated procedures. The result of such collaboration is certain to include significant improvements in the reliability of evidence that is obtained from eyewitnesses.
References


