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## **Cognitive Factors Influencing Eyewitness Memory**

Eyewitness memory is a person's recollection of an event they have seen, including information about people, actions, objects, locations, and the sequence in which events occurred. It may also refer to a follow-up investigation of a suspected offender. Often, eyewitness testimony is very convincing and can seem like an eyewitness account of a crime. However, memory is not a completely true representation of what actually happened that can be played out again without alterations. It is a reconstructive mental process during which the attention, interpretation, retention and recall of the seen play a role in reporting the experience later. Thus, a witness may be truthful, confident and yet at the same time be wrong. Stress, distance, drugs or alcohol, delay, duration of exposure to a crime scene, discussion by other witness, misinformation, procedure used to select lineup, and many other factors can impact eyewitness memory. In this essay, the three cognitive factors that are rooting in various aspects of memory will be discussed. The first is attentional narrowing which occurs during a threat, specifically, weapon focus. The second is that of post event misinformation and source monitoring failure. The third is decision making during police lineups. Therefore, it is claimed that most of the errors by eyewitnesses occur as a normal product of cognition and memory and are not necessarily created through intentional lying or lack of performance. Legal processes should thus aim to preserve memory from contamination and evaluate individuals' testimony carefully (Brassil et al., 2024; Carlson et al., 2021).

The first form of cognition is how attention was divided in the event that was witnessed. People cannot process everything around them in its entirety and therefore have limited attention. In an alarming or unusual situation, focus will tend to shift to information that seems "right now" to safety. The term weapon focus is used to describe witness's greater fixation on the weapon (such as a knife or gun) as compared to the person carrying it and the

broader scene (Harvey & Sekulla, 2021). One witness has a very vivid memory of the weapon and cannot give a good description of what the faces, attire or actions of the perpetrators looked like. That's key because the richness of one memory element does not prove the accuracy of other elements of the memory.

Attentional narrowing is the process that can be used to explain weapon focus. A weapon is likely to be threatening, visually arresting and unexpected. It thus can be able to draw upon cognitive resources which would otherwise be utilized to process facial identity (West et al., 2025). A person checking out a potential threat might be adaptive from an evolutionary standpoint, as a way of assessing the risk, and of preparation for an escape. This survivalist reaction may be problematic for the investigation of crime, however. The witness might concentrate if the gun is moving, where it is pointing, and if the gun is going to be fired. Consequently, the person may be unable to code unique facial characteristics and may be mistaken in believing that everyone looks alike. This means that the person may not have sufficient time or memory to encode unique facial features and may think that everyone looks the same. Even if the witness had not primarily focused his or her attention on the person in the event, the witness may be asked at a later point to identify the person whom he or she did not know.

This problem could be understood with the help of working memory theory. Working memory is a limited-capacity system to temporarily store and manipulate information that is attended. More attention is dedicated to a weapon will leave less for processing other information (Greene et al., 2020). One of the most difficult aspects of facial recognition is dealing with the general relationship between several elements of the face such as the eyes, nose, mouth, facial shape, tone of the skin and expressions. A short and interrupted gaze at a face can result in a poor memory imprint. In another lineup, the witness

is able to identify a general class of persons but not enough specifics to allow him or her to differentiate between a guilty suspect and an innocent one who is similar. The witness can still feel familiar and think they are seeing the object they're familiar with.

Harvey and Sekulla (2021) explored weapon focus under the context of alcohol use. The participants were asked to drink a drink of alcohol or a placebo before they watched a mock robbery that contained a gun or no weapon. Participants who drank alcohol and whose attention was drawn to a weapon showed poorer memory for central information in respect to the target male than did participants in the no weapon condition. The researchers used alcohol myopia theory to explain their pattern. The theory is that alcohol impairs the thinking process and increases the probability of paying attention to the more salient and immediate cues. The study is important in that it doesn't just assert that drunk witnesses are untrustworthy. Rather, it suggests that intoxication and weapon presence may interact to impair encoding of person related information via a cognitive mechanism (Harvey & Sekulla, 2021).

One of the advantages of weapon focus research is that experiments are conducted in a controlled manner. Participants are able to see what is being depicted in the study and the length of time that they are presented with it is controllable, as is the comparison of memory with the weapon or without the weapon. This allows more definitive statements of causation than are possible from case reports or police records. It also allows researchers to investigate if the presence of weapons influences memory recall for specific aspects of an event, instead of memory itself. But laboratory research has its limitations. Being exposed to a simulated crime is different than being confronted with a real threat. The participants typically know that they are safe, while actual victims might be frightened, hurt, unsure of what is happening and have long lasting trauma. This could be because the effects of high levels of stress are

underestimated in laboratory trials. Weapons employed in experiments, on the other hand, might seem to be very novel and thus have greater attentional effects than weapons in some real settings.

The tendency to think that one should conclude a witness is unreliable if they focus on a weapon should not be viewed as evidence to that effect. It can be influenced by the length of exposure, distance between victim and gunman, lighting conditions, actual danger, if the individual is a victim or gunman and if the gunman was pointing. The witness can also switch from the gun to the perpetrator's face. Hence, there is a need to refrain from assumptions on the part of police and courts. They should determine the circumstances of the witness's viewing of the event. Some important questions is the length of time that the weapon was in view, did the witness feel they were threatened with harm, did the perpetrator drink alcohol or drugs, did the witness have a prolonged viewing of the perpetrator's face. This information is a more meaningful source of information on which to assess identification evidence than confidence.

Post event misinformation is the second factor. The misinformation effect is the phenomenon in which an individual who has witnessed a given event reports the information as if it were part of the event itself, even if the information he or she has been given is incorrect. For instance, a witness could see an offender wearing a dark jacket and then hear a police officer say a "black jacket". Then the witness can be confident in his/her recollection of the black jacket. A source of misinformation can be interview questions, media reports, social media, other witness interviews, multiple interviews, feedback from police, or informal with family and friends. There is a clear reason for its importance as memory can become contaminated after the crime has been committed. This implies that the memory that is

accurate on the first day may become less accurate during the normal investigative and social processes.

Source monitoring theory provides a good account of this effect. Memories don't have a fixed label indicating exactly where that information originated from. People recall information and form judgements on the source based on how familiar it feels and if there is visual, context or emotional detail. A witness could be able to recall that the offender was wearing a black jacket but not recall whether they noticed it first hand, read the information in an article or heard it in a conversation. The witness can then say that the detail is from the event in question. This is an error of source memory not a lie. The witness may truly think that the false information is personally observed. This is in line with source monitoring explanations that suggest that when the relationship between the original event and the subsequent source is less strong, unwanted information can be associated as having happened as part of the source event (Puddifoot, 2020).

The plausible misinformation effect can be taken into account by discussing fuzzy trace theory. This theory states that people have verbatim and gist representations. Verbatim memory is for remembering details and gist memory is for remembering the gist of an event. A witness could not remember the colour of the jacket but remember that the offender was wearing dark coloured clothing. Furthermore, a second report, that the jacket was black, fits with this general memory and may be absorbed into its memory. This indicates that it does not take much to manipulate memory with misinformation to be effective. It only requires to fit with the incomplete understanding of the event by the witness.

Brassil et al (2024) undertook a systematic review that investigated the possible protective factors of cognitive abilities against individuals from misinformation. The researchers found a general relationship between reasoning ability, perceptual ability, and

memory ability and more susceptibility to misinformation, so that stronger reasoning, perceptual, and memory ability tended to correspond to less susceptibility to misinformation. Individuals with higher cognitive ability might be better equipped to store detailed information regarding events, detect discrepancies between the event and subsequent information, or differentiate between real events and suggestions. The review didn't suggest any individuals are immune to misinformation, however. The smartest, best-spoken, most confident, and most interested witnesses can still have source monitoring errors. In the legal context, this is crucial, as courts frequently base their decisions on the witness's level of confidence, education, or certainty. These qualities can affect witness believability, but don't mean memory is accurate.

Blank et al. (2021) explored double misinformation, a concept that is relevant as witnesses might receive false information from multiple sources. Their work showed that the amount of misinformation effects increased with repetition. Variation in apparent source of misinformation did not, however, affect suggestibility itself, apart from repetition. This is significant because this indicates that "repeated information" might be influential not only because it is repeated, but because it is familiar. Some familiarity may be mistaken for verification of detail, or it may be a memory detail that has become familiar. The repeated exposure to an object used by an offender might then cause the witness once more to experience it as easy to remember, and consequently to believe that they saw it happen. This repeated exposure to the object that an offender used could then cause the witness to remember it again as easily, and from there to imagine that they actually witnessed the offender using that object.

The misinformation literature has substantial strengths. Subsequent to this, the investigators can sort out what happened, the misinformation that was given, and the memory

test itself. This helps them to determine if there is a change in recall due to inaccurate information. One other way of studying the comparison is to compare memory for misinformation items with memory for control items within the same participants. The value of these is that they can be used for neutral interviewing, immediate recording of the events, and prevention of leading questions. Studies have their limitations, however. Short videos or written descriptions of a crime often are provided in laboratory studies that do not convey the emotional force of a real crime. Real witnesses might have to interact with police several times, be filmed by the news, suffer from delays, trauma or conversing with several individuals. These aspects can lead to greater difficulty in real memory contamination than is reflected in lab research.

The moral ramifications are profound. It is important for police officers to ask open questions asking the witness to tell them what he remembers. An interviewer should not ask if the offender had a logo on his/her black jacket, but instead asking the witness what the offender was wearing. It is important for witnesses not to speak to each other about the incident and to be interviewed comprehensively (not summarily afterwards). A complete record may reveal any hint of the interviewer adding or reacting to certain responses. It is not the aim of the activity to acquire as much detail as possible. Rather, the goal is to keep the evidence of the witness from being confused with the evidence of the witness's memory and acknowledge that ambiguity is a standard feature of evidence.

The third one is related to cognitive decision making in a police line-up. A lineup is not just a memory check in which they determine if a witness remembers the person. It's also a decision situation that may impact the way the witness remembers. A witness can make a relative judgement by identifying who appears to be the most similar to the person perpetrating the crime in the lineup. This is a risky strategy when the actual wrongdoer is not

present since the same individual may not be at fault. A witness can also make an absolute judgement by comparing each person with the witness, without relying on the third party, and disapproves the lineup when no person is familiar enough, such as judging whether the person in the lineup is similar to the individual in his mind. The procedure used by police can encourage one strategy over the other (Seale-Carlisle, 2024).

The concept of signal detection theory is useful, because it separates the issues of discriminability from response criterion. The witness's ability to distinguish a guilty suspect from innocent suspect is the concern of discriminability. Response criterion has to do with how much information from memory the witness needs for decision. A procedure could have more of an impact on reducing the number of false identifications by making the witnesses more careful, rather than on increasing their recognition ability. This is because if a procedure is poorly identified, this does not necessarily reflect that it is not a good pedestrian procedure. Correct identifications also may fall, if not, when fewer witnesses identify anyone. Thus, it is important to evaluate lineup procedures by looking at correct identifications, false identifications, and rejections in conjunction (Kellen & McAdoo, 2022).

According to the diagnostic feature detection theory, witnesses should rely on the diagnostic facial features to make a decision. Diagnostic features rule out innocent alternatives to the guilty suspect. Several persons in the line up share nondiagnostic traits, including overall age, hairstyle, ethnicity, facial hair or physique. A fair formation can be used to help a witness identify features he shares with the offender and infer there is no reason to believe that the features are evidence that he was to blame. This can help to draw attention to other more contrasting information. The show up is one that did not supply such a comparison. Generally speaking, the witness is not aware of the features in the scene they are

witnessing, or there wouldn't be any to compare against them, which makes the common features seem significant (Shen et al., 2022).

To analyze the effects of encoding specificity and diagnostic feature detection theory, Carlson et al. (2021) analyzed a large sample of participants. They concluded that lineups result in more discriminability than showups and that identification performance is dependent upon the similarity between encoding and retrieval conditions. A procedure that more closely corresponds with limited angle and somewhat hidden faces of the witnesses could facilitate more accurate retrieval if a witness viewed the offender from such a limited angle or when the face of the offender was partially obscured. This research is significant as it has shown identification is not only administrative. They can manipulate the given pieces of evidence in the witness's mind.

Yet the link between lineup format and accuracy is still debated. Kaesler et al. (2020) analysed sequential lineups with signal detection analysis methods. They found that sequential lineups did not necessarily lead to better discriminability, but they did lead to a more conservative response criterion. This calls into question some easy-going over the superiority of one set-up. In a sample, A more conservative witness may only make a few wrong identifications but may also fail to make even a few correct identifications. Thus, the research emphasises the need to assess the cognitive process of a decision, and not just the decision itself (Kellen & Klauer, 2022).

Meyer et al. (2023) further developed this approach by rotating the faces in interactive lineups and viewing them from various perspectives. Participant-adopted interactive lineups yielded more discriminability than static photos and sequential video lineups, particularly if participants saw the faces from profile angle viewing at the beginning. The finding is consistent with encoding specificity as it may prove more helpful to help

witnesses reconstruct their initial view. It also suggests that identification procedures might be designed to facilitate memory, not just a difficult choice of the limited information.

However, in face learning studies on the Internet, emotions are not as intense, and they do not have such a personal meaning as during actual criminal events. This indicates that there are still some gaps in research before interactive procedures can be widely implemented (Meyer et al., 2023).

The results of such focus of attention, combined with the processes of misinformation and lineup decision, show that eyewitness memory can be affected at all stages of the legal process. Threatening situations may cause weapon focus, which can inhibit encoding of faces. Misinformation can impact the recall of an event due to source monitoring errors and familiarity. Line-up procedures can be factors in the type of evidence obtained diagnostic or just the most familiar person. For eyewitness evidence, these findings do not imply that it should be rejected automatically. However, it demonstrates that it is highly unreliable, depending on the circumstances under which the memory was created, stored and validated (Brassil et al., 2024; Carlson et al., 2021; Harvey & Sekulla, 2021). Police should record the viewing environment, make neutral and recorded interviews, not share misleading information, make use of fair lineups, never give positive feedback, and record confidence right after an identification. This should also be documented immediately following the initial identification as feedback and repeated testing may lead a witness to change their confidence in the identification (Seale-Carlisle et al., 2024). These protections are of ethical value because misidentified eyewitness testimony can be a cause for wrongful conviction, and the correct perpetrator can go unidentified (Carlson et al., 2021; Meyer et al., 2023).

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