

Use of AI Acknowledgement

I acknowledge the use of Quillbot (<https://quillbot.com/ai-chat>) from 20 July 2026 to 23 August 2026 to check my work. I used the prompt(s):

1. Please give suggestions to improve the fluency and readability of the following sentences.
2. Please check if there are any grammar mistakes in the following sentences.
3. Please connect these sentences into a fluent paragraph.
4. Please check if the following paragraph structure is logical.

I confirm that I have not presented any AI generated text as my own work. I confirm I have copies of my drafts, notes, and other resources I used before, and after the use of AI tools which I may be asked to provide in evidence.

I acknowledge the use of Consensus (<https://consensus.app/>) from 20 July 2026 to 23 August 2026 to support my work. I used the prompt(s):

1. Please provide me with materials on cognitive factors influencing eyewitness memory.
2. Please provide me with research evidences about the weapon focus effect.
3. Please provide me with research evidences about the misinformation effect in memory.
4. Please show me studies about the relationship between eyewitness identification accuracy and lineup procedures.
5. Are the findings of the following journal articles converging?
6. Please provide research articles that are similar or related to the following.

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A Critical Evaluation Of Cognitive Factors Influencing Eyewitness Memory

Eyewitness testimony is crucial in criminal cases. However, after decades of cognitive psychology studies, it is now found that human memory is not about recalling things or events, but more about reconstructing them. Memory of a witnessed event is not like a video recording. Instead, that memory can be modified, distorted or even forgotten in various ways. This essay will critically discuss cognitive factors which affect the accuracy of eyewitness memory. It will provide theoretical and empirical findings to support these factors and to evaluate their strength and limitation on explaining the failure of memory in forensic settings.

Wells' (1978) distinction between estimator variables and system variables is a convenient way of organising the factors. Estimator variables appear during the incident and are independent of the criminal justice system. These are, for instance, stress, lighting or the period of time an individual is exposed to a situation. In contrast, system variables are under the control of the justice system. These include factors such as the type of interview conducted or the lineup method employed. This distinction is critical to understand what can only be tackled indirectly and what can be changed with policy modifications.

This essay addresses three major factors related to each of the three phases of memory, namely encoding, retention, and retrieval. First, there is the attentional narrowing under stress and heightened arousal at the encoding stage of memory, typified by the weapon focus effect. Second, the misinformation effect at the retention stage, where new information acquired after the witnessed event erodes initial memory. And third, the influence of system variables at the retrieval stage, such as in lineup identification procedures and the connection between confidence and accuracy. Each factor will be examined using theoretical analysis and empirical data, followed by a critical assessment. After that, it will evaluate the findings' importance and ethical ramifications for the judicial system.

The first factor involves how attention and physiological arousal at the point of encoding narrows the focus of a witness's perception and what they subsequently can remember (Davis et al., 2024). It could be understood through Easterbrook's (1959) cue-utilization theory, which suggests that as the level of arousal increases, attentional focus narrows and fixates on cues that stand out from the environment or are threat-related. Consequently, peripheral details go unnoticed, a situation called peripheral blindness. When this is carried over to an eyewitness context, it manifests itself as the **weapon focus effect (WFE)**. In such cases, the presence of a weapon draws focus away from other details of the incident, such as the perpetrator's appearance (Loftus et al., 1987). For example, Loftus et al., (1987) used eye tracking and found that participants placed in a scenario involving weapons focused on the weapon longer than those in the no-weapon context. Later, they performed poorer on face recognition and peripheral detail recall tasks. This phenomenon can be explained using the resource-limited theory of attention, in which threat-related stimuli are given priority for processing, while other information is ignored (Wickens, 2021).

Research has proved that the WFE is indeed real, but its extent and stability depend on the measurement of memory. Steblay (1992) reviewed 19 studies and found the effect size moderate for when the witness described the suspect ($d = .55$), but small for the accuracy of identifying the suspect from a lineup ($h = .13$). This indicates that a weapon affects us more regarding background information than to face recognition. Likewise, Kocab & Sporer (2016) examined all available experiments and determined that, even though holding a weapon influenced people's accuracy in describing the offender, it did not do much to their ability to identify the right person in a lineup. Also, it has been demonstrated that the WFE is greater under more threatening circumstances, meaning the more a person feels threatened by the weapon, the poorer their memory becomes (Fawcett et al. 2013). This implies that increased emotional arousal could be the cause too, not just from encountering something unusual.

That is not to mention the WFE has some significant drawbacks. One of them is that its impact to lineup identification is inconsistent, as mentioned above. Besides that, the question of why humans are drawn to weapons has also been raised: is it because they are uncommon or scary? Pickel (1998) discovered that almost anything out of place in any given context might trigger a similar effect, such as a man holding a chicken at a hair salon. Furthermore, Flowe et al. (2013) found that a gun presented on its own without any context or reason will not necessarily capture visual attention just because it is a weapon. Based on these results, it can be concluded that a weapon alone does not naturally trigger the WFE. The context, for example, the weapon-holder's intention to use it or the situation's dangerousness, plays an important role as well. Moreover, recent research using eye-tracking with realistic video scenarios challenged the common belief that the presence of a weapon impedes or distracts attention from the criminal's face (Körner et al., 2023). However, its ecological validity is uncertain, as what works in staged lab studies may not translate directly into actual real-world crimes.

The second factor is the **misinformation effect (ME)** during retention interval. It refers to the impact of new information learned after the event on memory for the event. It can alter a witness's recollection of the original event, even leading them to recall something that never occurred (Loftus & Klemfuss, 2023). The ME is rooted in Bartlett's (1932) idea that recalling events does not work like playing a videotape. Rather, events are reconstructed by piecing memories together, making it easily influenced by new information acquired subsequently. A well-known example is the experiment conducted by Loftus & Palmer (1974), who presented people a filmed car accident and asked them how fast the cars were going when they collided with each other. Those asked with the word "smashed" gave higher speed estimates compared to those asked with the word "hit". In addition, the "smashed" group was more likely to falsely remember seeing broken glass at the scene. This study shows that witnesses' recollections can be altered significantly even by minor wording changes.

Now, researchers are debating if the ME is caused by post-event information simply erasing the original memory, or by a source monitoring failure. In this case, witnesses retain the original memory but they mix up the source, thinking that the misleading detail came from the witnessed event, not from something they were told afterwards (Loftus & Klemfuss, 2023). The key point here is that if people manage to notice that the information they were told later diverges from what they saw initially, their memories would not be distorted. This is known as the discrepancy detection principle. Therefore, advanced warning before exposure to confusing information may decrease individuals' vulnerability to the ME, but that does not remove the risk entirely. For example, Blank & Launay (2014) carried out a meta-analysis and discovered that these pre-warnings can provide a moderate level of protection. However, Bulevich et al. (2022) later noted that such protection is less effective when the misleading information is highly accessible or repeated. To observe the ME in real world settings, Morgan et al. (2013) studied active-duty military soldiers during intense, high-stress survival training to determine its strength. Soldiers who were exposed to misleading information about an interrogator exhibited significant memory distortions, including identifying the wrong person in a lineup task, despite they were trained to resist external influences.

The ME has serious implications in areas like police interviews, discussions between witnesses, and media reports after a crime (Bartlett et al., 2022; Crittenden et al., 2026; Wong et al., 2025). It has also resulted in legal policy changes since it is a known cause of wrongful convictions (Crittenden et al., 2026). Nevertheless, it has its limitations. First, its exact mechanism is still unknown. Some suggests it involves a change or replacement of the original memory, while others believe it is a source confusion problem (Sun & Wang, 2026; Wiechert et al., 2025). This disagreement makes it impossible to develop a "one-size-fits-all" countermeasure to it. Second, due to ethical constraints, the unpredictability of real-life situations can never be completely replicated in a controlled lab study. Even among the more

realistic studies, such as Morgan et al. (2013), it is difficult to extrapolate the results to the general public as the sample size is small and from very specific populations. Lastly, not everyone will respond to the ME in the same manner. Depending on personal differences in cognitive abilities like working memory capacity, some people are more or less susceptible to it (Brassil et al., 2024). Thus, it should not be assumed that eyewitnesses will always provide unreliable information.

The third factor is **system variables** that operate at the retrieval of memory. These include police lineup procedures and the reliability of witness confidence as an indicator of identification accuracy. Wells (1978) suggested that system variables are the most feasible method of enhancing the accuracy of eyewitness evidence because they are directly under the control of the criminal justice system. One of the major issues in this field is whether lineups should be shown simultaneously (all at once) or sequentially (one by one). About this, Lindsay and Wells (1985) proposed that sequential presentation minimizes witnesses' reliance on relative judgment, encouraging them to compare lineup members to their memories of the perpetrator instead of to each other. Additionally, their findings along with that of Steblay et al. (2001) claimed that sequential lineups reduce false identification of innocent suspects. These studies had a huge impact and many police agencies in the United States changed their policy to adopt sequential lineups as the new practice.

Nonetheless, in a large-scale field study, Wixted et al. (2016) administered a double-blind lineup with real eyewitnesses from the Houston Police Department, such that neither the officer nor the eyewitness knew who the actual suspect was. The eyewitnesses' confidence ratings were also collected immediately. Surprisingly, they discovered that simultaneous lineups were in fact more helpful for correct identification than sequential ones, contradicting earlier opinions. In addition, Wixted & Wells (2017) re-investigated the relationship between confidence and accuracy of identification, and overturned the previous belief that those two

were poorly connected. What they discovered is that confidence expressed during the first identification is actually a strong indicator of accuracy, though only under “pristine” conditions. Such conditions include a fair lineup, neutral instructions, double-blind administration, and immediate collection of confidence rating before any confirming feedback or repeated viewing occurs. Why simultaneous lineups are more effective can be explained using the diagnostic feature-detection theory. Based on this theory, witnesses are able to compare diagnostic features (features unique to the perpetrator) between different members of the lineup when they are presented all at once. At the same time, they can disregard non-diagnostic features, such as hair colour, that many people share. Such side-by-side comparisons are harder to make in sequential viewing (Carlson et al., 2021).

This area of research can be placed directly into policy, as lineup procedures are system variables that can be manipulated through official rules and guidelines. To demonstrate, the National Research Council (2014) has already endorsed double-blind procedures and immediate confidence collection as standard practice. However, the study by Wixted & Wells (2017) has its shortcomings. Specifically, it appears that the relationship they discovered between confidence and accuracy is rather fragile because it only maintains under carefully controlled conditions. In real life where witnesses may speak with other witnesses, view news coverage or social media updates on the crime, or perhaps receive feedback from officers prior to the collection of confidence rating, this connection becomes much weaker. For this reason, confidence should not always be viewed as a good indicator of accuracy. Another point worth mentioning is the historical shift in the field. Although sequential lineups were more popular in the 1990s, more recent studies have found that simultaneous lineups are more advantageous. In this sense, it is clear that policies based on a single set of data run the danger of being implemented too soon.

These three factors show that eyewitness memory can be compromised at any stage. First, individuals who are under high stress or stimulation may experience narrowed attention, causing them to ignore a lot of details or forget what was initially encoded. Second, they may encounter misleading information that can alter their original memory during the retention interval. Thirdly, various identification practices during the retrieval may increase or decrease the accuracy of a witness's recollection. All of these factors are supported by well-known theories and research evidence, including Easterbrook's cue-utilization theory, Bartlett's reconstructive model of memory and Wells' estimator–system variable model. Yet, future research is faced with a challenge: tightly controlled lab experiments offer precise results but might not reflect real life, while studying real-world situations gives a truer picture of human behaviour but is much harder to control and measure scientifically. Researchers must find a way to navigate this when applying cognitive theory to forensic practice.

There are practical and ethical implications to these findings. In practice, they facilitate adjustments that experts already have suggested, such as implementing double-blind lineups, collecting confidence ratings immediately, removing weapon-related distraction in the interview space, and conducting cognitive interview to avoid asking leading questions. These steps assist in minimising the risks of witnesses being exposed to misleading information that may influence their memory of the incident. Their impact on the ethical side is bigger. The reconstructive nature of memories warns against treating eyewitness testimony as the truth. Many wrongful convictions that were later overturned with DNA evidence are caused by eyewitness giving false testimony in court. Hence, eyewitness evidence must be utilised properly, particularly in conjunction with other forms of evidence and expert opinion, else it could lead to the conviction of innocent people while the guilty walk free. Most significantly, court procedures should always be up to date to keep up with the latest understanding of memory failure.

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