

Acknowledgement of AI Tool Use

I acknowledge the use of Claude AI (<https://www.chatgpt.com/>) on 27 August 2026 to clarify concepts and support my research using the prompt(s):

1. What is eyewitness memory?
2. What is the cognitive behind it that can influence eyewitness memory?
3. Is it rare for witnesses to give a completely uncontaminated first account?

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 as evidence.

I acknowledge the use of Grammarly (<https://www.chatgpt.com/>) on 27 August 2026 to structuring my paragraph using the prompt(s):

1. Please check the following text for readability, grammar and syntax.

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 as evidence.

I acknowledge the use of Chatgpt (<https://www.chatgpt.com/>) on 23 August 2026 to structure my essay using the prompt(s):

1. Can you please advise me on how to structure an essay?

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 as evidence.

I acknowledge the use of NotebookLM (<https://www.chatgpt.com/>) on 26 August 2026 to summarise and compare from source articles using the prompt(s):

1. Summarize the key findings of this article and how they relate to eyewitness memory reliability.
2. Compare the findings of these articles on eyewitness reliability.

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 as evidence.

In psychological science, eyewitness memory is studied as a form of forensic memory evidence and is frequently relied on in the justice system, from routine criminal trials to major cases (Wixted & Mickes, 2022; Nichols, 2023). The formation and retrieval of eyewitness memories involve complex cognitive processes that can influence how accurately an event is remembered and reported (Lentoor, 2023; National Research Council, 2014). Before evaluating these processes, it is necessary to clarify their definitions. Encoding refers to the first time information is perceived and recorded when an event is witnessed (Mujawar et al., 2021). Storage involves retaining this information between witnessing the event and recalling it later (Mujawar et al., 2021). Retrieval is the process of accessing and reporting stored information (Mujawar et al., 2021), such as during a police interview or a formal identification procedure like a line-up. Distortion may occur at any one of the three stages in an eyewitness's account and frequently happens at more than one at the same time (Lentoor, 2023).

However, psychologists reject the popular belief that human memory operates like a video camera that records a situation in perfect, unchanging detail that can simply be “played back” whenever they want. Instead, psychological science has established that human memory is highly malleable, easily influenced, and prone to distortion (Lacy & Stark, 2013; Loftus, 2017). Consequently, eyewitness memory is seen as unreliable; it is not a perfect camera recording but is easily reconstructed and manipulated by different factors. These factors may affect how information is perceived, encoded, stored, and retrieved, and therefore play a direct role in determining the accuracy of eyewitness memory (National Research Council, 2014). The issue is important since eyewitness misidentifications have been involved in about approximately 70% of the cases where people have been wrongly convicted and the convictions have since been

overturned as a result of DNA testing (Wixted et al., 2018), which means that the reliability of eyewitness memory is now a topic of discussion in both psychological and forensic research.

There are several theories which explain how cognitive factors can influence eyewitness memory, and it is worthwhile to very briefly mention two of the most influential ones before moving on to the main argument of the essay. The misinformation effect explains how post-event information is retroactively integrated into an original memory. For instance, the brain may reconstruct the memory, making it seem as if a witness ‘remembers’ details that never happened when they are exposed to leading questions or hear details from co-witnesses. Loftus & Palmer (1974) showed that simply changing a word in a question (from "smashed" to "bumped") changed how fast people thought a car was going. A second relevant theory is the source monitoring framework, which explains how people attribute the origins of their memories. For instance, individuals might wrongly regard a detail which they had heard from another person as something they saw with their own eyes. Experimentation carried out by Gabbert, Memon and Wright (2003) provided evidence that when witnesses had discussed an event with a co-witness before recalling it, they gave a large and significant number of details which they had not actually seen, the details being those that had come from the other witness's account and having been incorporated into their own memory.

Building on these ideas, this essay argues that eyewitness memory is not merely 'unreliable' in an absolute sense, but the accuracy is shaped by specific stages: encoding, storage, and retrieval (Manual, 2025). By carefully looking at the theory and the empirical research at each of these stages — starting with attentional narrowing under stress, then looking at the reconstructive incorporation of information acquired after the event, and finally considering source confusion at the time of identification — the essay reaches the conclusion that the

accuracy of eyewitness accounts should be seen as something that depends on the circumstances, specifically depending on whether or not there has been contamination, rather than as a fixed aspect of memory itself (Wells et al., 2006). It is also important to acknowledge, before narrowing the scope of this essay, that researchers have found many cognitive factors that affect eyewitness memory at different stages, such as weapon focus, stress, exposure time, cross-race bias, schema-driven reconstruction, the misinformation effect, source monitoring errors, unconscious transference, and changes in confidence during identification (Berkowitz et al., 2020; Bornstein et al., 2012; Fawcett et al., 2013; Hourihan et al., 2012; Körner et al., 2023). Because the literature is so broad, this essay will not cover every factor. Instead, it will focus on three well-supported and distinct cognitive factors, and deliberately selected in order to illustrate one aspect from each of the three stages of memory processing mentioned above — weapon focus at the stage of encoding, the misinformation effect during the stage of retention, and source monitoring errors during the process of retrieval.

To better understand how theory and research help us learn about the cognitive factors that affect eyewitness memory, it is essential to examine each of the three stages that distortion can occur, starting with the encoding that took place during the event, then considering the retention that occurs after the event, and ending with the retrieval which happened during a police line-up aimed at identifying the perpetrator. Studies show that how well an eyewitness remembers something can depend on factors during the first encounter, such as the amount of time they are exposed to seeing a person's face (Bornstein et al., 2012).

At the encoding stage, Geoffrey Loftus's (2005) distance-as-filtering hypothesis explains how visual details become less clear as distance increases, making faces appear smaller on the retina and filtering out important features, which effectively excludes exactly the fine-grained

features such as the shape of the eyes, nose, or jawline that are most useful for subsequent facial recognition. Apart from distance, other cognitive factors can also reduce or divert a witness's attention during the encoding process. According to Easterbrook's (1959) cue-utilization hypothesis, the weapon focus effect occurs when people who are emotionally aroused focus on a significant, threat-related cue, such as a weapon, and as a result fail to notice other details like the perpetrator's face. In a similar way, the cross-race effect shows that witnesses are generally less accurate when trying to identify a person of a different race to their own (Hourihan et al., 2012). It is believed that this situation results from having gained more perceptual experience of the faces of their own racial group over the course of their lives. These factors that operate at the stage of encoding are responsible for the fact that two witnesses to the exact same event can end up with memory qualities that are meaningfully different, the difference depending on how far away they were standing, whether or not a weapon was present, and who the perpetrator was (Bornstein et al., 2012; G. R. Loftus & Harley, 2005; Hourihan et al., 2013; Körner et al., 2023).

One major strength of encoding research is its accuracy and scientific basis, which lets expert witnesses show what a person could actually see from a certain distance (G. R. Loftus & Harley, 2005). It considers factors such as viewing distance, image size, and lighting conditions to assess clearly how a witness could have perceived what happened (Körner et al., 2023). This makes encoding research particularly useful in real criminal cases compared to some more abstract theories in eyewitness memory. However, there is also an important limitation to consider. Early researchers in this area often grouped these "suboptimal" factors, such as poor viewing distance, high stress, and brief exposure, under the "optimality hypothesis" and argued that they would weaken the link between a witness's confidence and their accuracy (Semmler et al., 2018). In addition, more recent research suggests that the situation is more complicated than

this. Modern Confidence-Accuracy Characteristic (CAC) plots give us a more detailed picture (Wixted et al., 2018; Tekin et al., 2021). It shows that although poor viewing conditions can reduce overall accuracy, witnesses who make a high-confidence identification of their first attempt can still be highly accurate (Wixted & Wells, 2017). In other words, a witness who confidently and immediately identifies a suspect may still be very likely to be correct, even though the viewing conditions were not good. This finding challenges the earlier, more pessimistic views set out by the optimality hypothesis.

After someone witnesses an event, their memory does not remain frozen in place. It can be actively changed during the retention interval through misinformation and by talking with others who also saw the event (Pansky et al., 2011). It is important to know that this vulnerability is not limited to when an event is first remembered. Memory can continue to be altered even before the witness gives their first official statement to the police (Lacy & Stark, 2013). The source monitoring framework shows that people frequently mix up what they heard from others with what they saw themselves, and the misinformation effect explains how outside recommendations can become part of a person's memory (Johnson, 1997; Lentoor, 2023). According to fuzzy-trace theory, people rely on overall impressions and may use preconceptions or suggestions to fill in the blanks because specific details fade from memory quickly compared to the general “gist” of an event (Brainerd & Reyna, 2015; Reyna et al., 2016). So, when someone is asked to recall specific details later on, witnesses may unconsciously rely on stereotypes or suggestions from others to fill the gaps left by faded verbatim memory (Reyna et al., 2016). As a result, they may provide an account that feels subjectively accurate to them, despite that it has been partially reconstructed rather than genuinely remembered the event.

These theories are supported by lab studies and real cases, like the Anna Lindh murder investigation, where talking with others before police interviews led to less accuracy in suspect descriptions (Granhag et al., 2013). This similarity between laboratory research and a real high-profile case suggests that misinformation and source monitoring effects are not only found in experiments, but can also happen in real-life criminal investigations. However, in real life, it is rare for witnesses to give a completely uncontaminated first account, since they may encounter post-event information or discuss with their friends, family, or medical staff before speaking to police, which creates the opportunity to alter their memories there is no way to tell if this has happened (Wells et al., 2020). This makes it difficult to apply laboratory findings directly to real criminal cases, because in real-life situations, things are more complex and messier in actual police investigations (Wixted & Mickes, 2022), which rarely exist in controlled conditions like those used in experiments.

At the retrieval stage, features such as double-blind administration and how fillers are chosen can strongly influence the accuracy of eyewitness identification (Wells et al., 2020). Gary Wells's (2020) research shows that police lineups are methodologically like psychological experiments, just as poorly designed experiments can lead to biased results, a poorly designed lineup can also influence witness's identification. Suggestive procedures, such as telling a witness that the suspect's appearance may have changed, can make witnesses less strict and increase the likelihood of mistakes (Wells & Bradfield, 1998). For example, if an officer tells a witness that the suspect's appearance may have changed since the event, or does not explain that the actual perpetrator may not be present in the lineup, the witness may become less cautious when making decisions. This can increase the chance of them choosing someone, whether correct or not, because they feel expected to make a selection. Repeated testing, like repeatedly

asking the same witness to identify a suspect can also change memory over time and make people more confident in later identifications, even when those identifications are not necessarily more accurate (Wells et al., 2006; Shaw & McClure, 1996) .

While research on retrieval has led to important police reforms and shown that a witness's first, confident identification is usually accurate under appropriate procedures, there are still problems (Wixted & Wells, 2017). In real-life situations, police departments do not always follow the best practices recommended by research (Wixted & Wells, 2017). In instance, safeguards such as double-blind line-ups, where the officer does not know who the suspect is, and recording the witness's confidence level are used in less than one-third of actual identification procedures. Even under the best and most carefully controlled conditions, research suggests that witnesses can still report inaccurate information with high confidence (Berkowitz et al., 2020). This means that treating eyewitness memory as always reliable can mislead juries into thinking that being 100% confident means being 100% correct, and this matter is very important in the courtroom context.

In short, theories can offer clear explanations of how memory can be distorted at different stages of the eyewitness process, and controlled experiments widely support these ideas. For example, stress narrows attention (Fawcett et al., 2013), new information can alter memory (Pansky et al., 2011), and confusion about sources can lead to mistakes in identification (Gabbert et al., 2003). However, a common issue exists across all three stages, even well-controlled lab studies often do not capture the strong emotions and experiences of real-life witnesses. New research, like Confidence-Accuracy Characteristics (CAC) plot analysis, suggests that errors may come more from how procedures are handled than from memory itself (Wixted & Wells, 2017). This means eyewitness accuracy depends on the situation, not on a fixed ability. Because of this,

psychologists now increasingly recommend using specific procedural safeguards like cognitive interviewing techniques and single-test identification procedures in order to protect the honesty of witness testimony instead of dismissing it (Wells et al., 2020).

This conclusion has important practical and ethical aspects beyond psychological theory. Since eyewitness misidentification is a major cause of wrongful convictions, the justice system should not see eyewitness testimony as either flawless or completely useless (Wixted et al., 2018). In practice, research has already led to changes in forensic procedures. For example, double-blind sequential line-ups and the Cognitive Interview technique (Fisher & Geiselman, 1992), which uses context reinstatement and different memory cues to improve accurate recall without raising false reports. These developments show that psychological theory can lead to safer and more reliable practices. Ethically, there are also ethical concerns on both sides. Relying too much on eyewitness testimony can lead to the conviction of innocent people, while disregarding it entirely can allow actual criminals to escape punishment and prevent victims from obtaining justice. According to the research presented in this essay, the best approach is to consider eyewitness memory as evidence that must be protected against contamination. This can be achieved by ensuring fair procedures, avoiding suggestive questions, and recording confidence as soon as possible, rather than assuming that memory is always perfect or always flawed.

References

- Berkowitz, S. R., Garrett, B. L., Fenn, K. M., & Loftus, E. F. (2020). Convicting with confidence? Why we should not over-rely on eyewitness confidence. *Memory*, 30(1), 1–6. <https://doi.org/10.1080/09658211.2020.1849308>
- Bornstein, B. H., Deffenbacher, K. A., Penrod, S. D., & McGorty, E. K. (2012). Effects of exposure time and cognitive operations on facial identification accuracy: A meta-analysis of two variables associated with initial memory strength. *Psychology, Crime & Law*, 18(5), 473–490. <https://doi.org/10.1080/1068316x.2010.508458>
- Brainerd, C. J., & Reyna, V. F. (2015). Fuzzy-trace theory and lifespan cognitive development. *Developmental Review*, 38, 89–121. <https://doi.org/10.1016/j.dr.2015.07.006>
- Deffenbacher, K. A., Bornstein, B. H., Penrod, S. D., & McGorty, E. K. (2004). A Meta-Analytic Review of the Effects of High Stress on Eyewitness Memory. *Law and Human Behavior*, 28(6), 687–706. <https://doi.org/10.1007/s10979-004-0565-x>
- Easterbrook, J. A. (1959). The effect of emotion on cue utilization and the organization of behavior. *Psychological Review*, 66(3), 183–201. <https://doi.org/10.1037/h0047707>

Fawcett, J. M., Russell, E. J., Peace, K. A., & Christie, J. (2013). Of guns and geese: A meta-analytic review of the 'weapon focus' literature. *Psychology, Crime & Law*, 19(1), 35–66. <https://doi.org/10.1080/1068316x.2011.599325>

Fisher, R. P., & Geiselman, R. E. (1992). *Memory-enhancing techniques for investigative interviewing: The cognitive interview*. Charles C. Thomas.

Gabbert, F., Memon, A., & Allan, K. (2003). Memory conformity: Can eyewitnesses influence each other's memories for an event? *Applied Cognitive Psychology*, 17(5), 533–543. <https://doi.org/10.1002/acp.885>

Granhag, P. A., Ask, K., Rebelius, A., Öhman, L., & Mac Giolla, E. (2013). 'I saw the man who killed Anna Lindh!' An archival study of witnesses' offender descriptions. *Psychology, Crime & Law*, 19(10), 921–931. <https://doi.org/10.1080/1068316x.2012.719620>

Hourihan, K. L., Benjamin, A. S., & Liu, X. (2012). A cross-race effect in metamemory: Predictions of face recognition are more accurate for members of our own race. *Journal of Applied Research in Memory and Cognition*, 1(3), 158–162. <https://doi.org/10.1016/j.jarmac.2012.06.004>

- Hourihan, K. L., Fraundorf, S. H., & Benjamin, A. S. (2013). Same faces, different labels: Generating the cross-race effect in face memory with social category information. *Memory & Cognition*, 41(7), 1021–1031. <https://doi.org/10.3758/s13421-013-0316-7>
- Johnson, M. K. (1997). Source monitoring and memory distortion. *Philosophical Transactions of the Royal Society of London. Series B: Biological Sciences*, 352(1362), 1733–1745. <https://doi.org/10.1098/rstb.1997.0156>
- Körner, H. M., Faul, F., & Nuthmann, A. (2023). Revisiting the role of attention in the “weapon focus effect”: DO weapons draw gaze away from the perpetrator under naturalistic viewing conditions? *Attention, Perception, & Psychophysics*, 85(6). <https://doi.org/10.3758/s13414-022-02643-8>
- Lacy, J. W., & Stark, C. E. L. (2013). The neuroscience of memory: Implications for the courtroom. *Nature Reviews Neuroscience*, 14(9), 649–658. <https://doi.org/10.1038/nrn3563>
- Lentoor, A. G. (2023). Cognitive and neural mechanisms underlying false memories: Misinformation, distortion or erroneous configuration? *AIMS Neuroscience*, 10(3), 255–268. <https://doi.org/10.3934/neuroscience.2023020>
- Loftus, E. F. (2017). Eavesdropping on memory. *Annual Review of Psychology*, 68(1), 1–18. <https://doi.org/10.1146/annurev-psych-010416-044138>

Loftus, E. F., & Palmer, J. C. (1974). Reconstruction of automobile destruction: An example of the interaction between language and memory. *Journal of Verbal Learning and Verbal Behavior*, 13(5), 585–589.

Loftus, G. R., & Harley, E. M. (2005). Why is it easier to identify someone close than far away? *Psychonomic Bulletin & Review*, 12(1), 43–65. <https://doi.org/10.3758/bf03196348>

Manual. (2025, December 31). *Reference guide on eyewitness identification*. National Academies Press (US). Nih.Gov. <https://www.ncbi.nlm.nih.gov/books/NBK621592/>

Mujawar, S., Patil, J., Chaudhari, B., & Saldanha, D. (2021). Memory: Neurobiological mechanisms and assessment. *Industrial Psychiatry Journal*, 30(1), S311–S314. <https://doi.org/10.4103/0972-6748.328839>

National Research Council. (2014). Identifying the culprit. *Identifying the Culprit: Assessing Eyewitness Identification*. <https://doi.org/10.17226/18891>

Nichols, R. M. (2023). Eyewitness memory. In L. M. Bietti & M. Pogačar (Eds.), *The Palgrave encyclopedia of memory studies* (pp. 1–6). Palgrave Macmillan. https://doi.org/10.1007/978-3-030-93789-8_36-1

- Otgaar, H., Riesthuis, P., Ramaekers, J. G., Garry, M., & Kloft, L. (2022). The importance of the smallest effect size of interest in expert witness testimony on alcohol and memory. *Frontiers in Psychology*, 13, 980533. PubMed Central. <https://doi.org/10.3389/fpsyg.2022.980533>
- Pansky, A., Tenenboim, E., & Bar, S. K. (2011). The misinformation effect revisited: Interactions between spontaneous memory processes and misleading suggestions. *Journal of Memory and Language*, 64(3), 270–287. <https://doi.org/10.1016/j.jml.2010.12.003>
- Reyna, V. F., Corbin, J. C., Weldon, R. B., & Brainerd, C. J. (2016). How fuzzy-trace theory predicts true and false memories for words, sentences, and narratives. *Journal of Applied Research in Memory and Cognition*, 5(1), 1–9. <https://doi.org/10.1016/j.jarmac.2015.12.003>
- Semmler, C., Dunn, J., Mickes, L., & Wixted, J. T. (2018). The role of estimator variables in eyewitness identification. *Journal of Experimental Psychology: Applied*, 24(3), 400–415. <https://doi.org/10.1037/xap0000157>
- Shaw, J. S. III, & McClure, K. A. (1996). Repeated postevent questioning can lead to elevated levels of eyewitness confidence. *Law and Human Behavior*, 20(6), 629–653. <https://doi.org/10.1007/BF01499235>

Stambor, Z. (2006, April). How reliable is eyewitness testimony? *Https://Www.Apa.Org*.
<https://www.apa.org/monitor/apr06/eyewitness>

Tekin, E., DeSoto, K. A., Wixted, J. H., & Roediger III, H. L. (2021). Applying confidence accuracy characteristic plots to old/new recognition memory experiments. *Memory*, 29(4), 1–17. <https://doi.org/10.1080/09658211.2021.1901937>

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(3), 339–342. <https://doi.org/10.1177/1745691618758261>

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(3), 360–376. <https://doi.org/10.1037/0021-9010.83.3.360>

Wells, G. L., Kovera, M. B., Douglass, A. B., Brewer, N., Meissner, C. A., & Wixted, J. T. (2020). Policy and procedure recommendations for the collection and preservation of eyewitness identification evidence. *Law and Human Behavior*, 44(1), 3–36.
<https://doi.org/10.1037/lhb0000359>

Wells, G. L., Memon, A., & Penrod, S. D. (2006). Eyewitness evidence: Improving its probative value. *Psychological Science in the Public Interest*, 7(2), 45–75.
<https://doi.org/10.1111/j.1529-1006.2006.00027.x>

Wixted, J. T., & Mickes, L. (2022). Eyewitness memory is reliable, but the criminal justice system is not. *Memory*, 30(1), 67–72. <https://doi.org/10.1080/09658211.2021.1974485>

Wixted, J. T., Mickes, L., & Fisher, R. P. (2018). Rethinking the reliability of eyewitness memory. *Perspectives on Psychological Science*, 13(3), 324–335. Sage Journals. <https://doi.org/10.1177/1745691617734878>

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(1), 10–65. <https://doi.org/10.1177/1529100616686966>