



ADVANCES IN NEUROSCIENCE AND THE RULES OF EVIDENCE

**HOW THE EVIDENCE CODE IS BASED ON
AN OUTMODED UNDERSTANDING OF HOW
THE HUMAN BRAIN WORKS**

Fred M. Blum

Supreme Court Justice Oliver Wendell Holmes, Jr., wrote that “the rules of evidence in the main are based on experience, logic, and common sense.”¹ The rules of evidence are based on the foundation that witnesses should testify to things they have personally experienced. Much of the evidence code is focused on keeping unreliable evidence out of the courtroom.

What if Justice Holmes was wrong and the rules of evidence are not based on experience, logic, or common sense, but on our misperceptions of how humans encode, store, and recall what they have experienced? This is not a rhetorical question. New strides in the neurosciences have challenged the traditional orthodoxy that witnesses are even able to distinguish between what they experience and what

they have learned through other sources. Evolutionary biology has built a framework around these advances in the neurosciences to explain why an experience we thought transpired in a particular way actually happened differently.

The human memory formed millennia before Blackstone penned his first treatise on evidence. The purpose of our memories was to aid humans in those endeavors that were required to keep the species alive—establishing relationships with other humans, finding food and shelter, staying away from predators, and reproducing. Human memory was focused on how to deal with the here and now. To answer questions such as “Is this person a danger?” “If I travel into this high grass will I be eaten?” “Where is the best place to get berries?” humans learned to call upon all of their knowledge regardless of the source. Information that was obtained from others was just as important as that which was gained firsthand.

The individual who dismissed information because it was hearsay—or even double or triple hearsay—was at an extreme evolutionary disadvantage. Imagine that you are on the Serengeti a hundred thousand years ago and you come across a berry that you have never seen before. You are hungry and near starvation. Do you eat the berry or pass it by since it may be poisonous? If you choose to eschew it you may starve, but if you eat it you may die. What is a human to do? The human who can recall that his best friend told him that someone told him that he heard that the berry was edible may survive. The human who ignores the information because it is hearsay may starve.

Thus, we evolved in such a manner that how we obtained information may be relevant, but it was not the paramount consideration. Humans who could use the entirety of their knowledge survived and reproduced.

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It is not only information that humans see or are told which was important. Human brains developed into amazing pattern-recognition machines. This ability allowed hunters to recognize that the movement of tall grass was related to prey that they were stalking or the lion that was stalking them. It also allowed them to look at the sky and see that cloud formations meant that inhospitable weather was on the way and that shelter needed to be found. As it relates to our hungry humans and the berries the hunters found, pattern recognition let them know that the dead animal near the berries was a danger sign. Or that the presence of many footprints near the bush, but no dead animals, was a good indication that the berries were edible.

The process that humans used to recall what they knew about the danger of the berries is called reconstructive memory. Our ability to recall events is affected by various cognitive processes. These include our ability to perceive and our biases and imagination. In recalling events, we use all the tools that are available to us. These tools affect what we recall and how close the recall is to objective truth.

When we move from the Serengeti to the courtroom, the environment is much different and so are the imperatives. Survival is no longer at stake. The stakes are infinitely

lower than those present on the plains of Africa. However, that does not mean that the mechanisms that were developed over millennia of evolution are suspended.

Scientists used to believe that when humans recalled an event, the experience was akin to looking at a video or movie of the event. The event would be called up in our minds and whatever memories were present would be played back. Bias and other factors could affect the memories, but the basis for the recall was still the “movie” of the event. It was the lawyer’s job to help or force the witness to distinguish between which impressions were part of the “movie” and which were not.

However, we now know that memory does not work in such a simplistic fashion. Brain scans demonstrate that memories are not stored in one area of the brain, such as the location of film footage in a library. When memories are triggered, numerous parts of the brain are activated. While there is still a great deal we don’t understand about this process, the movie theory of recall has been debunked.

Since our recall of events is influenced by a wide number of factors, this leads to a number of questions. When witnesses testify about their observations, the critical question is whether they can filter out all sources of knowledge of the event other than what they actually saw. Can the witness ignore what she or he was told by others and the associations that she or he derived from that information? As important, can the witness distinguish between these disparate sources of information? Significant evidence suggests that the answer to both questions is “no.”

One powerful example is as follows: the number of people who believe they were at an important event is typically far greater than the number of people who were really



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there. The event is witnessed on television or replayed to them through interactions with others to such an extent that one comes to believe that she or he was there. In recalling events, humans draw reasonable inferences from the information at their disposal and have great difficulty distinguishing between their observations and the inferences they draw from those observations. In one experiment, subjects were asked to view the video of a martial artist preparing to break boards with his hands. The video

stopped before the boards were actually broken. When the subjects that viewed the video were asked to recall the footage, the majority of the subjects stated the martial artist had actually broken the boards.

Dr. Stephen Lindsey in “Memory Source Monitoring and Eyewitness Testimony” reviewed the available scientific evidence relating to eyewitness identification and the ability of the witness to distinguish between information gleaned at the time of the witnessed event and thereafter.² After reviewing the relevant studies he concluded that the inability to remember the particular source of a recollection is a common memory failure. According to Lindsey, after an event occurs, the eyewitness may receive additional relevant information in newspaper articles, Internet entries, conversations with other witnesses, or discussions with the police. This new information is not sorted conveniently in the brain in a folder marked “new information,” but is instead stored along with the original eyewitness account. When the event is retrieved, the witness may be unable to distinguish between the information originally observed and that which is learned later.

Dr. Lindsey concluded:

The core idea underlying the source monitoring approach is a simple one: That we can name, in remembering, things that went unnamed during the event itself; that we can feel, in reminiscence, emotions that were not experienced when the event occurred; and that we can perceive in our recollections shapes and colors to which we were blind in the past. In short, that activated memory records can serve as input to ongoing cognitive processes, and that all remembering is a blend of reactivating and interpreting, retrieving and constructing. People are sometimes aware of using inference to fill

in missing details in their recollections, but more often these judgment processes are performed rapidly and without conscious reflection as an integral part of remembering. That is, remembering naturally and necessarily involves judgment and inference processes akin to those by which we perceive and understand and label aspects of ongoing external events. Thus not only is external reality transformed and interpreted in our ongoing experience, but our remembrance of things past requires an additional layer of transformation and interpretation.

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Eyewitnesses may not be able to differentiate between information they obtained from viewing the event and what they learned thereafter. Their testimony will undoubtedly be colored by what they saw on television or were told by the police. The same is true for individuals who identify a particular item that may have emitted a harmful substance or an alleged statement that was said at a particular time. When the witness testifies as to what she or he saw or heard, subsequent observations are most

likely unknowingly coloring the testimony.

The larger problem is that there is no valid way to know if the witness is actually testifying only as to his or her original observations. The witness is unable to distinguish between the original and subsequent information. His or her certainty as to the recollection is not relevant, since certainty and accuracy are not positively correlated. Extrinsic evidence may be able to shed some light on the problem, but that is not always the case.

The bottom line is that we cannot reliably know if a witness's statements are based on what the witness personally observed. These types of differentiations were neither relevant nor useful to our development as a species. That the rules of evidence require witnesses to make the differentiation does not alter the way humans recall information. It is unlikely that the requirement for a legal foundation will be removed from the evidence code. However, it

should be recognized that the requirement is premised on an arcane and outmoded concept of the workings of the human memory.

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Notes

1. *Donnelly v. United States*, (1913) 228 U.S. 243, 277 (Holmes dissenting).
2. Stephen Lindsey, "Memory Source Monitoring and Eyewitness Testimony." Published in *Adult Eyewitness Testimony: Current Trends and Developments*, edited by D. F. Ross, J. D. Read, and M. P. Toglia. New York: Cambridge University Press (1994).

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