



Eyewitness Memory is Unreliable

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Seminar Available on this topic.

Australian eyewitness expert Donald Thomson appeared on a live TV discussion about the unreliability of eyewitness memory. He was later arrested, placed in a lineup and identified by a victim as the man who had raped her. The police charged Thomson although the rape had occurred at the time he was on TV. They dismissed his alibi that he was in plain view of a TV audience and in the company of the other discussants, including an assistant commissioner of police. The policeman taking his statement sneered, "Yes, I suppose you've got Jesus Christ, and the Queen of England, too." Eventually, the investigators discovered that the rapist had attacked the woman as she was watching TV - the very program on which Thompson had appeared. Authorities eventually cleared Thomson. The woman had confused the rapist's face with the face that she had seen on TV. (Baddeley, 2004).

Introduction

Eyewitness identifications greatly sway both police and juries. As the Thomson example illustrates, an eyewitness identification can even outweigh a strong alibi supported by other testimony. This is sometimes unfortunate because eyewitness memory is highly fallible. Memory errors fall into two classes: people can 1) either completely fail to recall an event or 2) have an inaccurate recollection. People have very different attitudes about the two types of failure. Most people understand that total memory failures are common. They can introspect about occasions when they have been unable to recall an event, so failures by other people are hardly surprising. In contrast, people are overly optimistic about the accuracy of their retrieved memories, probably because most errors have little practical consequence and go unnoticed. Given the confidence in their own memory accuracy, people have too much faith in the accuracy of eyewitnesses. Memory has a multitude of quirks and inaccuracies that creep into its everyday operation. Here, I describe some basic background on memory and on the types of memory distortions that are common.

Types of Memory

It is more accurate to speak of human *memories* rather than of human *memory*, since people have several distinctly different types. The basic division is among sensory, short-term and long-term memories. Each of these memories further consists of subsystems. There is a separate sensory memory for each sense, iconic (visual), echoic (auditory), etc. Some also distinguish a "working memory" consisting of separate executive, phonological loop and visuo-spatial subsystems.

Most matters involving eyewitness testimony depend on accuracy of long-term memory, which has at least two subsystems, implicit and explicit memory. Implicit memory stores things that you don't consciously know, like how to peddle a bike. You just get on the thing and start peddling without conscious thought.

Explicit memory stores things that you can consciously verbalize. Explicit memory further subdivides into semantic and autobiographical types. Semantic is memory for facts. For example, you know that George Washington was the first president of the United States but probably don't remember the exact circumstances when you learned that fact. Similarly, you may remember the gist of a conversation that you had a year ago, but don't remember the exact words that were used. Introspectively, semantic memory is more like "knowing" than like recalling. It's not so much that I recall George Washington being the first president as I know that George Washington was the first president. In contrast, autobiographical memory is recollection of events or episodes in your life. You remember exactly what was said and the actual, physical details. In most situations, eyewitnesses are asked to report information that is stored in autobiographical memory.

Below, I discuss some of the many factors that cause unreliability in autobiographical memory. It is impossible, however, to get far in discussing memory, however, without first dispelling the *homunculus fallacy*. Most people intuitively imagine that perception and memory work something like this: the eyes are TV cameras that project a picture of the world to an inner screen. In the head, there is a little man, the "homunculus," who views the screen and perceives the world. Memory is simply a videotape recording of what we have seen on the screen. To remember, we simply rewind the tape, and the little man sees the pictures again. Of course, there is no little man, no screen and no videotape. The fallacy of this model should be obvious: Who is seeing the image in the head of the homunculus? There would have to be another, smaller homunculus in the head of the first homunculus and so on in infinite regress.

Causes of Memory Unreliability

1. Memory is "blurred"

There are several reasons for this. One is that images in our mind's eye are never as clear as an actual perception. If you try to recall your bedroom, you can get a general image of the location of large and significant objects, their shapes, colors, etc. But the image is not nearly as detailed as what you would see if you were actually viewing the room.

People are much better at discriminating between two objects when they are physically present than when one is present and the other is in memory. Two colors which are easily distinguishable when presented side by side may be confused when one or both must be recalled in memory. In fact, while humans can distinguish thousands (some say millions) of physically present colors, one study suggests that they can identify only 17 in memory.

Color is a particular good example of memory's low resolution. While there are thousands of discriminable colors, color memory is very limited. Research suggests that people group colors into about 11 categories: white, black, red, green, blue, yellow, brown, orange, purple, pink and gray. Memory will easily distinguish

between colors of different categories (red vs. blue) but will have a very difficult time distinguishing shades within a category (blue-green vs. blue-violet.)

Color memory also has some biases. People typically remember colors as being closer to a purer color category, so an orange-red will be remembered as a more perfect red. For example, people often think of tomatoes as being red, but check them the next time you go to the supermarket: they are usually very orangey. People also remember colors as being brighter than they actually were. I have a gray Toyota Camry, similar to the one shown on the left. After shopping when I return to the parking lot, I often mistakenly head toward a "silver" Camry like the one shown on the right in the belief that it must be my car. Viewed next to each other, gray and silver cars are quite distinct. In memory, they are not.



Another problem is that memory often stores perceptual information in verbal form rather than as an image. That is, a person might see a blue car. This information is stored in memory as the words "blue" and "car." Later, the person will not be able to identify the shade of blue because memory has only stored the fact that the car was blue. Worse, the car perception may have been stored as "dark" and the person will not be able to distinguish among dark colors - dark blue, black, etc. This process of converting images to word-like forms is automatic and people are unaware when they do it.

Several authors have concluded that memory simply encodes the general gist of a scene. For example, memory may code a memory of a person as short, tall, young, fat, thin, old, white, black, rugged, etc. or some combination. If coded as "tall" and "fat", the person will have difficulty discriminating among different tall, fat people. Moreover, the witness might well characterize the person as being jolly, since fat people are often stereotyped as being jolly. Memory reconstruction (see below) often uses general knowledge and expectations to fill in blanks of specific memories. In short, the eyewitness confuses information stored in semantic and autobiographical memories.

2. Memory Fills In The Gaps

Memory is a reconstruction, not a record. As noted, memory traces are, at best, highly impoverished versions of the original percept. The eyewitness will often have insufficient information in the memory itself, so the reconstruction must invoke pieces of information from other sources. There are two main sources of additional information: 1) pre-existing schemas and 2) other memories. People understand the world through "schemas" and "scripts," stereotyped mental models of objects and events. When they recognize a situation, either in perception or in memory, they invoke the most applicable schema or script and may unconsciously fill in missing information in order to complete the reconstruction.

Further, people confuse information sources. The example at the top of this page provides a classic case of the fact that people often confuse the source of their memories. In this case, the eyewitness confused two actual events. In other cases, people confuse actual events with imagined memories. For many years, for example, I believed my earliest childhood memory to be of myself on the sand in Miami Beach. My parents had moved there when I was very young, but returned to Pittsburgh after only a year.

In talking to my brother recently, I realized that I would have to have been one year old at the time. This is far too young to have formed such a clear memory. In thinking about it, I realized that there was an event when I was about 7 that our family was discussing the time in Florida. I had imagined what it would have been like on the beach, possibly adding some imagery from our then annual summer trips to the beach at Atlantic City. For all this time, I was carrying around the memory of an imagined event rather than of an actual event.

This is a classic case of a common phenomenon - memory source confusion. An event memory may incorporate information subsequently gained from other witnesses or read in the newspaper, information drawn from general knowledge, information of another event or even information of an imagined event. People may inadvertently combine memory of two different events or confuse mental images with real events. This "misinformation effect" occurs because people are often poor at determining the source of information - another example of semantic memory intruding into autobiographical memory.

3. Memory systematically distorts perception

Memory tends to distort perception in systematic ways. For example, people tend to remember colors as being brighter and more saturated than they actually were. Other studies show that people who are asked to recall vehicle speeds tend to overestimate slow speeds and to underestimate fast ones. Additional studies show systematic biases in remembering distance and size. Lastly, as noted above, memory also biases toward expected events.

4. Memory is personal

Human memory does not exist so that an observer may accurately report previously seen events. The actual, physical events are merely grist for the mill of interpretation. Each witness extracts an interpretation that is meaningful in terms of his own beliefs, experiences and needs. Once the interpretation occurs, the events themselves become relatively unimportant. Moreover, since each person interprets the events in terms of his own world view, different eyewitnesses observing the same event may have different interpretations and different memories. To put it succinctly:

"We do not see what we sense. We see what we think we sense. Our consciousness is presented with an interpretation, not the raw data. Long after presentation, an unconscious information processing has discarded information, so that we see a simulation, a hypothesis, an interpretation; and we are not free to choose" (Norretranders, 1999).

Although Norretranders was talking about perception, the same basic operation applies to memory: 1) it is an interpretation, 2) the raw sensory data is largely discarded, 3) we are not free to choose, meaning that the

transformation from raw data to interpretation occurs automatically and outside volition. This is why people can be so certain despite the distortion - they were not aware of having "altered the facts."

5. Memory is biased by question retrieval method

Eyewitness memories can be biased by the questions asked at the time of retrieval. Several famous studies have shown that the question can supply information that the eyewitness will incorporate into the answer. The question can easily supply information that helps fill in gaps in the respondent's memory.

6. Memory Changes over time and with retelling

Numerous studies have shown that memory changes over time. The most notable effects include:

- Eyewitnesses incorporate information learned after the event into memory. For example, they may talk to another witness and use information from the conversation to fill in their reconstruction of the events. They may do this by combining two memories into one or by using bias or expectations of what probably was seen.
- As people recall an event over and over, they drop details from earlier versions and add new details to later versions. All things being equal, accuracy declines with each new version, at least until an asymptote is reached. In some cases, however, an eyewitness accuracy is lower when questioned immediately after a traumatic event.

References

Baddeley, A. (2004). *Your Memory: A User's Guide*. Richmond Hill, Canada: Firefly Books.

Norretranders, T., J. (1999). *The User Illusion: Cutting Consciousness Down To Size*, 186-87. New York: Penguin Books.

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