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**Perceptual and Memory Distortion
During Officer-Involved Shootings**

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"If it hadn't been for the recoil, I wouldn't have known my gun was working. Not only didn't I hear the shots but afterward my ears weren't even ringing."

"I saw the suspect suddenly point his gun at my partner. As I shot him, I saw my partner go down in a spray of blood. I ran over to help my partner, and he was standing there unharmed. The suspect never even got off a shot."

"When I got home after the shooting, my wife told me that I had called her on my cell phone during the pursuit of the violent suspect just prior to the shooting. I have no memory of making that phone call."

"I told the SWAT team that the suspect was firing at me from down a long dark hallway about 40 feet long. When I went back to the scene the next day, I was shocked to discover that he had actually been only about 5 feet in front of me in an open room. There was no dark hallway."

"During a violent shoot-out I looked over, drawn to the sudden mayhem, and was puzzled to see beer cans slowly floating through the air past my face. What was even more puzzling was that they had the word Federal printed on the bottom. They turned out to be the shell casings ejected by the officer who was firing next to me."

These representative samples, taken from actual officer-involved shootings, exemplify the quirky nature of perception and memory. Law enforcement officers fully realize that their superiors, legal authorities, and the public they serve will hold them completely accountable for their every action during an officer-involved shooting. These same individuals also will scrutinize the accuracy and truthfulness of statements made by officers taking part in such incidents. Therefore, it becomes important to understand that expecting officers to have perfect recall of any event is not realistic. Indeed, the body of research on perception and memory supports the fact that people rarely are capable of total and perfect recall of events.

Although the underlying physical processes of perception and memory continue as a matter of research and debate, empirical observation of human behavior can shed some light on the behavioral consequences of these processes. To this end, the author focused her research on the self-reported perceptual and memory distortions experienced by officers involved in shootings.¹

Background

Germane to this topic is how trauma and other highly emotional experiences can impact perception and memory. A noted researcher in the area of stress and fear conducted a comprehensive review of this topic.² He came to the conclusion that people have two distinctly different modes of processing information. One, the rational-thinking mode, happens during low emotional arousal states, whereas the second, the experiential-thinking mode, occurs during states of high stress and emotional arousal, such as would occur during an officer-involved shooting.

He pointed out that when people are not under high levels of stress, they have the ability to calmly engage in the conscious, deliberative, and analytical cognitive processing that characterizes rational thinking. However, when a perceived emergency requires quick action, they cannot afford this luxury. Instead, their cognitive processing system automatically switches over to experiential thinking. He stated that "people are angry, sad, or frightened not as a direct result of what objectively occurs but because of how they interpret what happens. The automatic, preconscious construals that are the effective instigators of such emotions are made so automatically and rapidly as to preclude the deliberative, sequential, analytical thinking that is characteristic of the rational system."³

He delineated the differences in rational and experiential thinking, including the concept that experiential thinking represents a system that "automatically, rapidly, effortlessly, and efficiently processes information,"⁴ an obvious advantage in a life-threatening situation demanding an immediate response. Along with facilitating automatic, rapid responses, he pointed out that experiential thinking is more likely than rational to have such characteristics as --

- * fragmented memory instead of an integrated narrative;

- * based on past experiences instead of a conscious appraisal of events;

- * intuitive and holistic instead of analytic and logical;
- * oriented toward immediate action instead of reflection and delayed action;
- * highly efficient and rapid cognitive processing instead of slow, deliberative thinking;
- * "seized by emotions" instead of "in control of our thoughts"; or
- * "experiencing is believing" instead of requiring justification via logic and evidence.

He continued with, "In most situations, the automatic processing of the experiential system is dominant over the rational system because it is less effortful and more efficient and, accordingly, is the default option."⁵ He noted that people frequently engage in experiential thinking during everyday events simply because it is more efficient, but "emotional arousal and relevant experience are considered to shift the balance of influence in the direction of the experiential system."⁶ This clearly applies to officers involved in shootings and other high-stress situations.

Previous Research

To understand this connection more thoroughly, the author reviewed previous research relative to officer-involved shootings. In the process, she concentrated on three main studies.

In 1986, two researchers were among the first to publish data specific to officer-involved shootings.⁷ In their study of 86 officers involved in shootings, they found that 67 percent of the officers saw the incident in slow motion, while 15 percent observed it as faster than normal. Fifty-one percent heard sounds during the event in a diminished manner, whereas 18 percent of the officers said that the sounds were intensified. Thirty-seven percent had tunnel vision, while 18 percent experienced greater visual detail.

In 1998, two other researchers studied a variety of reactions in 348 officers involved in shootings.⁸ They administered their surveys within 3 to 5 days after the incident, just prior to each officer's participation in a mandatory debriefing. They found that 41 percent of the officers thought that time slowed down, while 20 percent perceived that it sped up. Fifty-one percent said that sounds seemed quieter, whereas 23 percent reported sounds as being louder. Forty-five percent of the officers had tunnel vision, while 41 percent experienced an increased attention to detail. In addition, 22 percent of the officers reported memory loss for part of the incident.

A recent researcher did a comprehensive survey of officer-involved shootings that consisted of detailed interviews with 80 municipal and county law enforcement officers who reported on 113 separate cases where they shot citizens during their careers in law

enforcement.⁹ While his report contained a wealth of information, it also set out specific data relative to perceptual and memory distortions. He found that 56 percent of the officers saw the incident in slow motion, while 23 percent thought that it happened quicker than normal. Eighty-two percent reported that sounds diminished, whereas 20 percent thought sounds intensified. Fifty-six percent experienced heightened visual detail, while 51 percent had tunnel vision. In addition, 13 percent of the officers reported other types of distortion during the event.

Present Research

From 1994 to 1999, the author supplied a written survey to 157 officers involved in shootings from multiple agencies. Although approximately two-thirds of the officers received the survey during their individual mandatory debriefing within 1 week after the shooting, the author told them not to fill out the survey until they had attended a group debriefing (which typically occurs 2 to 4 weeks after the incident, allowing time for agencies to complete their investigations). The author did this because she discovered, in the course of conducting numerous group debriefings, that many officers do not fully realize the extent of their own memory and perceptual gaps and distortions until confronted with evidence to the contrary. During a group debriefing, as officers tell their versions of what happened, the complete picture begins to emerge. Participating officers enjoy the benefit of finding out what really happened overall and how their own version might differ. Even for officers who were the only officer present, their later perusal of investigation reports, including physical evidence and eyewitness statements, can educate them as to the lack of completeness and total accuracy of their memories of the event.

By contrast, the author collected the remaining one-third of the surveys from mental health or law enforcement professionals who gave the surveys to officers who they knew had been involved in shootings. With these surveys, the length of time that had passed since the shooting occurred varied more than those collected after group debriefings.

In addition, the sample did not represent a "clinical" population; these officers were not seeking treatment for post-traumatic stress disorder (PTSD), although some may have been experiencing a certain degree of PTSD. The majority of the officers who completed the surveys collected by the author were doing well emotionally by the time their group debriefing occurred. The officers voluntarily filled out the surveys, and the great majority of the officers returned them to the author.

Overall, the author's research revealed that 62 percent of the officers viewed the incident in slow motion, while 17 percent said that time appeared to speed up. Eighty-four percent of the officers noted that sounds seemed diminished, whereas 16 percent thought that sounds were intensified. Seventy-nine percent had tunnel vision, while 71 percent experienced heightened visual clarity. In addition, 74 percent of the officers stated that they responded on "automatic pilot," with little or no conscious thought. Fifty-two percent reported memory loss for part of the event, and 46 percent noted memory loss for some of their own behavior. Thirty-nine percent recalled experiencing dissociation (i.e., the sense of detachment or unreality); 26 percent had intrusive distracting thoughts; 21

percent noted memory distortion (i.e., saw, heard, or experienced something that did not really happen or it happened very differently than they remembered); and 7 percent reported having temporary paralysis.

Discussion

Past and Present Survey Results

Diminished sound refers to the inability to hear very loud sounds that a person ordinarily obviously would hear, such as gunshots. It ranges from not hearing these sounds at all to hearing them in an odd muffled, distant manner. This may contribute to the findings of previous researchers, as well as the author, indicating that officers often do not know exactly how many rounds they fired, especially as the number of shots increases.

Tunnel vision denotes the loss of peripheral vision. This, combined with heightened visual clarity, can result in the odd combination of officers seeing with unusual detail some stimuli within their narrowed field of vision, but remaining visually oblivious to the surroundings that they ordinarily would see with their peripheral vision.

Although 7 percent of the officers reported temporary paralysis, such a reaction is unlikely to represent "freezing" to the point of dysfunction during the event. In cases where the author debriefed officers who were angry at themselves for "freezing," she found that, in fact, this was simply the normal "action-reaction" gap that occurs because the officers can shoot only after the suspect has engaged in behavior that represents a threat.¹⁰ Although this gap occurs in a very brief span of time, because of the common perceptual distortion of slow-motion time, it can seem to the officers as if they stood there forever after perceiving the threat and before responding. While it remains possible that some of the respondents did, in fact, totally "freeze," it is unlikely that as many as 7 percent did. Perhaps, none did.

Intrusive distracting thoughts are those not immediately relevant to the tactical situation, often including thoughts about loved ones or other personal matters. In addition, memory gaps and perceptual distortions can result in "flash-bulb" memories, where the individual has a series of vivid images burned into memory, with the rest of the event somewhat fuzzy, a bit out of order, or even missing.

The author found one notable aspect about all of the studies. None quantified other perceptual distortions that can occur, such as distance distortion, color distortion, face recognition distortion, or lighting distortions.

Overall, although some of the studies found similar results on various items, inconsistencies also occurred in several items from study to study. Regardless of the methodological differences that might have contributed to these deviations, the most important finding remained the same for all. That is, independent studies using different methodologies found that memory and perceptual distortions, in fact, did occur to some degree in officer-involved shootings. Therefore, those who analyze the actions and

statements of officers involved in shootings must take these findings into account. Two researchers stated this clearly after finding that 22 percent of officers in their survey experienced memory loss.

While other studies have reported even higher numbers, 22 percent remains a highly significant amount given that the officers will be expected to testify regarding their actions sometime in the future. What appears to be a relatively common perceptual disturbance following involvement in a critical incident has the potential of opening up the officers to accusations of either outright lying or withholding the truth. This is particularly relevant should subsequent interviews result in additional observations or clarifications, as is often the case.¹¹

Implications for Investigators

These researchers accurately pointed out that memory is not a flawless "videotape" that can play back exactly the same way each time a person tries to remember a past event. Rather, memory is a creative and not entirely understood process. If an officer's recollection of an event is not a totally accurate representation of reality, it does not necessarily mean that the officer is lying or trying to engage in a cover-up. Likewise, it is normal for memories to change somewhat over time, and the changed or new memories may or may not represent reality more accurately. The same concept applies to other eyewitnesses and the suspects as well. No one should accuse an individual of lying simply due to inaccurate, inconsistent, or missing memories. While some individuals will choose to be untruthful, investigators should reserve this accusation for those cases where additional evidence exists to indicate that the person deliberately lied.

The author found that 21 percent of the officers "saw, heard, or experienced something during the event that I later found out had not really happened or happened very differently than how I remembered it." All participants in an event, including the suspect, eyewitnesses, and officers, have the potential to see, hear, feel, or experience things that did not actually happen. A wide variety of factors, including perceptual distortions, biases, beliefs, expectations, and prior experiences, influence people's perceptions. An interesting aspect to these memory distortions that the author repeatedly has observed is that they can "feel" more real to the witness than what actually happened. This remains consistent with the observation that experiential thinking is "self-evidently valid: 'seeing is believing,'" as opposed to rational thinking, which "requires justification via logic and evidence."¹² When confronted with a videotape that conclusively proved that he saw things that did not happen, a veteran SWAT officer told the author, "Doc, I now intellectually know that what I thought I saw didn't really happen, but it still feels more real to me than what I saw on the tape." Some witnesses sincerely and vehemently will insist that their perceptions and memories are accurate when, in fact, they may not be accurate at all.

The differences between rational and experiential modes of thinking also have implications in the postshooting aftermath. Clearly, officers need to be held accountable for all of their on-duty behavior, especially if they must use deadly force. However, those

who conduct postshooting analyses should keep two things in mind. First, while officers usually have only seconds (or less) to decide about using force, all of those doing postshooting analyses will have hours, weeks, months, or even years to contemplate all of the evidence and decide what the officers really should have done. Although postincident analysis can prove very helpful as a learning exercise, it was not an option available to the involved officers at the time of the shooting. Second, research indicates that officers will be in the experiential-thinking mode because it is the default option, especially in emotionally laden situations. On the other hand, all of those engaged in postshooting analyses have the ability to analyze the officers' behaviors in rational-mode thinking, a different cognitive process altogether and a luxury that the officers did not have during the shootings. This does not suggest that officers be given carte blanche to behave in any way they want during a high-stress situation. It does imply, however, that the law enforcement profession must remain rigorous in its training, realistic in its expectations, and cognizant of the demands of emergency situations.

Another research review found that "traumatic situations will inevitably result in memory impairment."¹³ These researchers pointed out, and the author agrees, that officers may make more thorough and accurate statements if they wait at least 24 hours, during which time they should get some sleep, before participating in their formal interview with investigators. Research evidence suggests that REM (rapid eye movement) sleep, in particular, helps integrate memories and facilitate learning and memory retrieval. Some officers might appear unusually calm shortly after an incident and may prefer to give an immediate full statement. Often, however, it is best for officers to sleep first and give their statements later. This does not preclude their providing enough brief information during an immediate on-scene "walk-through" to get the investigation started. But, investigators must conduct these initial sessions in a sensitive manner that does not compromise the officers' legal rights.

Given that perceptual and memory distortions are an integral part of traumatic events, investigators may find research on the cognitive interview technique helpful.¹⁴ The developers of this method found that how investigators interview individuals can significantly impact the ability of the witnesses to remember and report the details of an event. Their research indicated the cognitive interview as the most effective technique for facilitating memory retrieval with cooperative witnesses. Using proper interview techniques is particularly important for high-stress situations because during experiential thinking, the individual is more likely to be dissociative and "encodes reality in concrete images, metaphors, and narratives," whereas, in rational thinking, the individual is more logical and "encodes reality in abstract symbols, words, and numbers."¹⁵ This means that the survivors of traumatic experiences will find it challenging to translate the dissociated concrete images and metaphors they experienced during the high-stress event into the sequential, verbal, abstract, and logical narrative required by an investigative interview and courtroom testimony. Skilled investigators can help witnesses with this difficult task.

Implications for Training

Seventy-four percent of the officers that the author surveyed reported, "I responded automatically to the perceived threat giving little or no conscious thought to my actions." This finding coincides with the experiential-thinking mode, described as an "automatic, intuitive mode of information processing that operates by different rules from that of the rational mode" that "occurs automatically and effortlessly outside of awareness because that is its natural mode of operation, a mode that is far more efficient than conscious, deliberative thinking."¹⁶ This has profound implications for training because experiential thinking is based on past experiences. Therefore, under sudden, life-threatening stress, individuals likely will exhibit behavior based on past experiences that they automatically will produce without conscious thought. This means not only training officers in appropriate tactics but also providing sufficient repetition under stress so that the new behaviors automatically will take precedent over any previously learned, potentially inappropriate, behaviors that they possessed before becoming an officer.¹⁷

Another implication of the author's study, as well as other research, is that it supports the concept of reality-based training that all tactically minded officers and trainers know represents the foundation for reliable performance in high-stress situations. "Information obtained from textbooks and lectures is of a different quality from information acquired from experience. Experientially derived knowledge often is more compelling and more likely to influence behavior than is abstract knowledge."¹⁸

This is especially critical in sudden, high-stress situations requiring instant physical performance. Abstract knowledge obtained in lectures and books can be very useful in rational-thinking mode situations, such as formulating policies and analyzing situations. However, when officers face sudden, life-threatening incidents, their reality-based training experiences most likely surface.

Reality-based instruction that subjects the participants to high levels of stress during training also will help officers develop coping mechanisms to compensate for perceptual and memory distortions. For instance, to compensate for tunnel vision, many officers have learned to practice visually scanning the tactical environment during high-stress situations, such as pursuits and high-risk entries. Training under stress also will help officers learn to control their arousal level. As their physiological agitation escalates, so might their susceptibility to perceptual and memory distortions. Thus, learning to control arousal level can help reduce distortions. Therefore, officers should receive training in and regularly practice ways to control arousal levels in high-stress situations. One process, the combat breathing technique, has proven highly effective in this area.¹⁹

Officers and their family members also should receive training on what reactions they can expect during and after high-stress situations, such as shootings. Providing officers and their family members with information on what to expect can help them cope better with highly stressful events.²⁰

Finally, those who analyze or participate in the aftermath of officer-involved shootings should receive training as well. Such individuals could include attorneys, association representatives, peers, juries, journalists, command staff and supervisors, mental health

professionals, employee assistance personnel, worker compensation employees, and any others who have a vested interest in these events. This will better enable them to make informed, reasonable judgments about the officers' behaviors and advocate for the type of training and postincident care that the officers will need to best serve and protect their communities.

Conclusion

The observations of the officers at the beginning of this article effectively portray how perception and memory can influence an individual's understanding of a particular incident. One officer did not hear the sound of his gun discharging. Another did not remember calling his wife just prior to being involved in a shooting. Three others observed things happening in ways that did not actually occur. All of the officers were involved in the highly stressful and emotionally laden process of using deadly force and, therefore, subject to later scrutiny by their agencies and the citizens they serve for their actions.

Although highly trained in accurately describing events and uncovering facts pertinent to criminal investigations, law enforcement officers face the same difficulties that all people do when trying to recall what happened in high-stress situations. Research has revealed that people rarely can remember such events with total accuracy. The author's study, along with other research she examined, demonstrated that this finding holds true for officers involved in shootings. With this in mind, the law enforcement profession must realize the implications this has for officers and those who analyze their actions. Because critical incidents demand split-second decisions, officers must receive the best training that will help them react appropriately in high-stress situations. Likewise, those who analyze these events must understand the demands placed on officers during such incidents and maintain realistic expectations concerning what officers perceived during the events and what they can recall accurately afterwards. In the end, recognizing the perceptual and memory distortions that officers can have during a shooting can go a long way toward helping officers deal with such difficult situations and, perhaps, reduce their occurrence.

Endnotes

1. Officers can contact Dr. Artwohl, coauthor of *Deadly Force Encounters: What Cops Need to Know to Mentally and Physically Prepare for and Win a Gunfight* (Boulder, CO: Paladin Press, 1997), at alexisartwohl@msn.com or access her Web site at <http://www.alexisartwohl.com>

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3 Ibid.

4. Ibid.
5. Ibid.
6. Ibid.
7. R.M. Solomon and J.M. Horn, "Post- Shooting Traumatic Reactions: A Pilot Study," in *Psychological Services for LawEnforcement*, eds. J.T. Reese and H.A. Goldstein (Washington, DC: U.S. Government Printing Office, 1986).
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9. David Klinger, U.S. Department of Justice, National Institute of Justice, *Police Responses to Officer-Involved Shootings*, NCJ 192285 (Washington, DC, October 2001).
10. Bill Lewinski, "Why Is the Suspect Shot in the Back?" *The Police Marksman*, November/December 2000.
11. Supra note 8.
12. Supra note 2.
13. D. Grossman and B.K. Siddle, *Critical Incident Amnesia: The Physiological Basis and Implications of Memory Loss During Extreme Survival Stress Situations* (Millstadt, IL: PPCT Management Systems, Inc., 1998).
14. R.P. Fisher and R.E. Geiselman, *Memory Enhancing Techniques for Investigative Interviewing* (Springfield, IL: Charles C. Thomas, 1992).
15. Supra note 2.
16. Supra note 2.
17. Charles Humes, "The Flashlight Dilemma," *Tactical Edge*, 1992.
18. Supra note 2.
19. Charles Humes, "Lowering Pursuit Stress," *Police*, June 2001.
20. D. Meichenbaum, *Stress Inoculation Training* (Boston, MA: Allyn & Bacon, 1985).

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