

AELE Lethal & Less Lethal Force Workshop  
**Perceptual and Memory Distortions**  
**During Officer Involved Shootings**  
(2008 Update)  
Alexis Artwohl, Ph.D.

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

“I saw the suspect pointing his gun at my partner and as I shot him I saw my partner get shot and go down in a spray of blood. After I neutralized the suspect, 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 the cell phone during the pursuit of the violent suspect just prior to the shooting. She said I just called to tell her I love her. It turns out I also called my Dad. I have no memory of making either phone call.”

“I told the SWAT team 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 he had actually been only about five feet in front of me in an open room. There was no 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 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.”

## **Introduction**

Perception and memory can be quirky, as exemplified by these representative samples taken from actual events. The exact physical processes that govern perception and memory are yet to be fully understood. Given that police officers will be held fully accountable for their every action during an officer involved shooting, the accuracy and truthfulness of their statements will be intensely scrutinized. It is essential that police officers, and everyone who will be second guessing their actions and their statements, have a basic understanding that expecting officers to have perfect and totally accurate recall of any event, including an officer involved shooting, is not realistic. In fact, this basic premise applies to virtually all humans in all situations. The fact that people are almost never capable of total and perfect recall of events is agreed on by all memory researchers as a perusal of any basic textbook on memory will confirm.

Although the underlying physical processes of perception and memory are still a matter of research and debate, empirical observation of human behavior can shed some light on the behavioral consequences of these processes. The focus of this article is on the self-reported perceptual and memory distortions experienced by officers involved in shootings. Germane to this topic is how trauma and other highly emotional experiences can impact perception and memory.

Dr. Seymour Epstein, noted researcher in the area of stress and fear, reviewed this topic in his superbly comprehensive review article, *Integration of the Cognitive and Psychodynamic Unconscious*, published in the August, 1994 issue of AMERICAN PSYCHOLOGIST. He comes to the conclusion that people have two distinctly different modes of processing information: the “Rational” thinking mode which happens during low emotional arousal states, and the “Experiential” thinking mode which happens during states of high emotional arousal such as would occur during an emergency situation like an officer involved shooting. His article has profound implications for officer training, investigations of shootings, and helping trauma survivors recover from the emotional aftermath. Readers are encouraged to obtain and read this article.

Dr. Epstein points out that when people are not under high levels of stress they have the ability to calmly engage in the conscious, deliberative, analytical cognitive processing that characterizes Rational thinking. However, when a perceived emergency requires quick action this is a luxury that cannot be afforded. Instead, their cognitive processing system automatically switches over to Experiential thinking. He points out:

“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.”

Dr. Epstein delineates the differences in Rational and Experiential thinking, including the concept that Experiential thinking is a system that “automatically, rapidly, effortlessly, and efficiently processes information”, an obvious advantage in a life threatening situation demanding an immediate response. Along with facilitating automatic, rapid responses, he points out that Experiential thinking is more likely than rational to have the following characteristics:

- ▶ fragmented memory instead of an integrated narrative
- ▶ based on past experiences instead of 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”
- ▶ “experiencing is believing” instead of requiring justification via logic and evidence

Dr. Epstein goes on to point out that “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.” He points out that people engage in Experiential thinking during everyday events that are not highly emotionally arousing 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.” This clearly applies to officers involved in shootings and other high stress situations.

## Previous Research on Perceptual and Memory Distortions in Officer Involved Shootings

Mental health professionals who treat trauma survivors have noted that perceptual and memory distortions are in fact common in highly stressful events. Solomon and Horn (1986) were among the first to publish data specific to officer involved shootings. They found the following results in their study of 86 officers involved in shootings:

➤	slow motion	67%
➤	diminished sound	51%
➤	tunnel vision	37%
➤	visual detail	18%
➤	intensified sound	18%
➤	fast motion	15%

Honig and Roland (1998) studied a variety of reactions in 348 officers involved in shootings. Their surveys were administered within three to five days after the incident just prior to the officer's participating in a mandatory debriefing. They found the following results in regards to memory and perceptual distortions.

➤	sounds were quieter	51%
➤	tunnel vision	45%
➤	increased attention to detail	41%
➤	time slowed down	41%
➤	sounds were louder	23%
➤	memory loss for part of incident	22%
➤	time sped up	20%

Klinger (in review) did a comprehensive survey of officer involved shootings which consisted of detailed interviews with 80 municipal and county police officers who reported on 113 separate cases where they shot citizens during their careers in law enforcement. (Dr. Klinger's contact information is in the Training Resources section below). His report contains a wealth of information but specific to perceptual and memory distortions he found the following results:

➤	diminished sound	82%
➤	slow motion	56%
➤	heightened visual detail	56%
➤	tunnel vision	51%
➤	fast motion	23%
➤	intensified sound	20%
➤	other distortion	13%

## Present Study

In the present study a written survey composed by the author was given to 157 officers involved in shootings at multiple agencies. Approximately two thirds of these surveys were given to officers by the author within a few weeks after their shooting. They were collected between the years of 1994 to 1999. Although the officers were handed the survey during their individual debriefing within one week after the shooting, they were instructed to not fill out the survey until they had had the opportunity attend the group debriefing which typically occurred two to four weeks later after the investigation had been completed. The reason for this instruction is because it became apparent to me in the course of conducting numerous group debriefings that many officers are not fully aware of their own memory and perceptual distortions until they are confronted with evidence that their memories and perceptions are not as complete and accurate as they had previously thought. During the group debriefing, as each officer tells his or her version 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 from the big picture due to memory gaps, memory distortions, distance distortions, perceptual distortions, etc. Even for officers who were the only officer present, their later perusal of the investigation reports, including physical evidence and eyewitness statements, can educate them as to the lack of total completeness and accuracy of their memories of the event. About one third of the surveys were collected by other mental health or law enforcement professionals who gave the surveys to officers they knew who had been involved in shootings. The length of time that had passed since the shooting occurred was more variable. One characteristic of the sample is that it is not a “clinical” population: these were not officers seeking treatment for post-traumatic stress disorder (PTSD) although it is probable that some of them may have been experiencing some degree of PTSD. The great majority of the officers in the surveys collected by the author were doing well by the time the group debriefing occurred. Filling out of the surveys was voluntary and the great majority of officers who were given the survey returned them to the author.

The present study found the following results:

➤	diminished sound	84%
➤	tunnel vision	79%
➤	responding on “automatic pilot” with little or no conscious thought	74%
➤	heightened visual clarity	71%
➤	slow motion time	62%
➤	memory loss for part of the event	52%
➤	memory loss for some of own behavior	46%
➤	dissociation: sense of detachment or unreality	39%
➤	intrusive distracting thoughts	26%
➤	memory distortion: saw, heard, or experienced something that didn’t really happen	21%
➤	intensified sounds	16%
➤	fast motion time	17%
➤	temporary paralysis	07%

## Discussion

“Diminished sound” refers to the inability to hear very loud sounds one would ordinarily obviously hear, such as gunshots, sirens, shouting, etc. It ranges from not hearing these sounds at all to hearing them in an odd muffled, distant manner. This is one of the factors probably contributing to the finding of Klinger, the author, and common knowledge among those familiar with shootings, that officers often do not know exactly how many rounds they fired, especially as the number of rounds goes up.

“Tunnel vision” refers to loss of peripheral vision. This, combined with “heightened visual clarity”, can result in the odd combination of the officer being able to see with exquisite detail some stimuli within his narrowed field of vision, but being visually oblivious to his surroundings that he would ordinarily see with his peripheral vision.

Although 07% of the officers reported “temporary paralysis” this is very unlikely to represent “freezing” to the point of dysfunction during the event. In virtually every case where the author interviewed officers who were angry at themselves for “freezing” it turns out that it was simply the normal “action-reaction” gap that occurs because the officer can only shoot after the suspect has engaged in behavior that represents a threat. Although this gap is relatively short in time, because of the common perceptual distortion of slow motion time, it can seem to the officer as if he/she stood there forever after perceiving the threat and before responding. Although it’s possible that some of the respondents did in fact totally freeze, it is highly unlikely that as many as 07% did, and maybe none did. NOTE: For critical information and research on the dynamics of “action-reaction” in shootings, all readers are strongly encouraged to obtain the article *Why is the Suspect Shot in the Back* by Bill Lewinski, Ph.D., published in the November/December issue of THE POLICE MARKSMAN. (Contact information for Dr. Lewinski is in the Training Resources section ).

“Intrusive distracting thoughts” are thoughts not immediately relevant to the tactical situation, often including thoughts about loved ones or other personal matters.

The memory gaps and perceptual distortions often result in “Kodak moment” or “flashbulb” memories, where the individual has a series of vivid images burned into memory, with the rest of the event somewhat fuzzy or even missing. One officer described his memories of the event like “a bunch of snapshots with everything in between a bit vague. I’m not even positive the snapshots are in the right chronological order. It’s almost like someone threw them up in the air and they came down slightly out of order.” It’s unlikely that officers will consistently be able to provide a coherent, totally complete moment by moment, perfectly sequential narrative of the event.

In their research review, Grossman and Siddle (1998) discuss their findings that “traumatic situations will inevitably result in memory impairment.” They point out, and the author agrees, that one factor in facilitating memory retrieval for traumatic events would be that the officers not make their full statement to investigators until at least 24 hours has passed and they have had the opportunity to get a decent night’s sleep. Research evidence suggests that REM sleep in particular is important in integrating memories and facilitating learning and memory retrieval. This would enable officers to give a more complete and coherent statement. (Contact information for Grossman and Siddle is in the Training Resources section.)

One thing that is notable about all of the above studies is that there are a host of perceptual distortions that were not quantified in any of the studies, including: distance distortion, color distortion, face recognition distortion, lighting distortions, etc. There is virtually no factor in a shooting that can't be subject to perceptual or memory distortion.

It will also be noted that although some of the above mentioned studies found virtually the same results on some of the items there are obviously discrepancies in the exact figures from study to study. I won't waste time nit-picking the discrepancies and the supposed flaws in each study that might render one more accurate than the other because, frankly, the exact percentages don't matter. All that really matters is that independent studies using different methodologies have found that memory and perceptual distortions do in fact occur to some degree in officer involved shootings and must be taken into account when second-guessing the actions and the statements of officers involved in shootings. As Honig and Roland pointed out in discussing their finding that 22% of officers in their survey experienced memory loss:

“While other studies have reported even higher numbers, at 22 percent the results are still highly significant given that the officer will be expected to testify regarding his 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 officer to accusations of either outright lying or withholding the truth. This is particularly relevant should subsequent interviews result in additional observations and/or clarifications, as is often the case.”

### **Implications for Investigators**

Investigators will benefit from being trained in the issues discussed below:

Honig and Roland are entirely accurate in pointing out that memory is not a flawless “videotape” that is played back exactly the same way each time a memory is retrieved. Memory is in fact a creative, sometimes quirky, and not entirely understood process that can change over time and the additional memories that surface during later statements may or may not be a more accurate representation of reality. The most important implication for investigators to remember is that *if an officer's recollection of an event is not a totally accurate representation of reality, it does not necessarily mean the officer is lying or trying to engage in a cover-up. Likewise, it is normal for memories to change somewhat over time.* The same concept applies to other eyewitnesses and the suspects as well. Individuals should not be accused of lying simply due to inaccurate and/or missing memories. While some individuals will choose to be untruthful, this accusation should be reserved for those cases where there is additional evidence to indicate that the person deliberately lied.

The author found that 21% of the officers “saw, heard, or experienced something during the event that I later found out had not really happened.” Although this number is not huge, as Honig and Roland pointed out, it is certainly not trivial. Investigators need to understand that 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. People's perceptions are influenced by a wide variety of factors including perceptual distortions, biases, beliefs, expectations, prior experiences, etc. An interesting aspect to these memory distortions that the author has repeatedly observed is that they often

“feel” more real to the officer than what actually happened. This is consistent with Epstein’s observation that Experiential thinking is “self-evidently valid: ‘seeing is believing’”, as opposed to Rational thinking which “requires justification via logic and evidence.” When confronted with a videotape that conclusively proved that he saw things that didn’t happen, a veteran SWAT officer told the author: “Doc, now I intellectually know that what I thought I saw didn’t really happen but you know what, it still feels more real to me than what I saw on the tape.” The author has frequently heard this type of comment. The lesson here is that investigators need to be careful to not be misled by the sincere vehemence with which some individuals will insist that what they saw is absolute reality.

This clear difference between Rational and Experiential modes of thinking also has major implications in the post-shooting aftermath. Clearly, officers need to be held accountable for all of their on duty behavior, especially if they are required to use deadly force. However, we must all keep in mind two things: One, while officers usually have only seconds (or less) to make their decision about use of force, all those who will be second-guessing the officers have minutes, hours, weeks, months, even years to contemplate all the evidence and decide what the officer should have really done. Two, Epstein’s research indicates that officers will be in Experiential mode thinking because it is the default option, especially in emotionally laden situations. On the other hand, all the second-guessers have the luxury of “analyzing” the officers’ behaviors in Rational mode thinking which is a different cognitive process altogether, a luxury which the officers did not have. This is not to suggest that officers be given carte blanche do behave in any way they want during a high stress situation. It does, however, suggest that we must be realistic in our expectations, cognizant of the demands of an emergency situation, and keep in mind the different thought processes inherent in high stress vs. low stress situations.

Given that perceptual and memory distortions are an integral part of traumatic events, all investigators are encouraged to familiarize themselves with the “Cognitive Interview” developed by Fisher and Geiselman and outlined in their 1992 book: MEMORY ENHANCING TECHNIQUES FOR INVESTIGATIVE INTERVIEWING. They point out that how individuals are interviewed can impact the fullness and accuracy of their memories of an event and the most efficient method for achieving the aim with cooperative witnesses such as officers involved in shootings is the “cognitive interview.” This more efficient method may not be consistent with some of the interrogation tactics typically used with recalcitrant criminal suspects. Using proper interview techniques is particularly important for high stress situations because Epstein points out that 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.” This means that the survivors of traumatic experiences will find it challenging to translate the dissociated concrete images and metaphors they experienced into the sequential, verbal, abstract, logical verbal narrative that is required by an investigate interview and courtroom testimony. Skilled investigators can enhance this difficult task of memory retrieval and translation from Experiential images to Rational sequential narratives. (Contact information for Dr. Fisher is in the Training Resources section).

## Implications for Training

The fact that 74% of the officers in the present survey reported “I responded automatically to the perceived threat giving little or no conscious thought to my actions” is very consistent with the Experiential thinking mode found by Epstein. He describes Experiential thinking as an “automatic, intuitive mode of information processing that operates by different rules from that of the a rational mode” and comments that it “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.” This has profound implications for training given that Epstein points out that Experiential thinking is based on past experiences. This means that under sudden, life threatening stress some behavior will likely pop up automatically without conscious thought, and the officer and the community can only hope that those ?past experiences? will include up to date training that has programmed in effective, appropriate responses. This means not only training officers in appropriate tactics, but also providing sufficient repetition under stress so that the new behaviors will take precedent over any previously learned, potentially inappropriate, behaviors they brought with them to the job (Hume, 1992).

Another implication of Epstein’s research supports the mantra of “reality based training” that all tactically minded officers and trainers know is the foundation for reliable performance in high stress situations. Dr. Epstein states, “Information obtained from textbooks and lectures is of a different quality from information acquired from experience. Experientially derived knowledge is often more compelling and more likely to influence behavior than is abstract knowledge.” This is especially critical in sudden, high stress, physical performance based situations. Abstract knowledge obtained in lectures and books can be very useful in Rational thinking mode situations such as formulating policies, analyzing situations, etc., but when we are in a sudden, savage fight for our life it’s the Experientially based information that will surface and save our skin (or, sadly, not.)

Reality based training that subjects the trainees to high levels of stress during training will also help officer develop coping mechanisms to compensate for the perceptual and memory distortions outlined above. For instance, to compensate for tunnel vision, many officers and soldiers have learned to practice “visually scanning” the tactical environment during high stress situations such as pursuits, high risk entries, etc. Training under stress will also help trainees learn to control their arousal level. As their physiological arousal escalates, so might their susceptibility to perceptual and memory distortions. Thus, learning to control arousal level can help reduce distortions. All trainees should be trained in and regularly practice the “combat breathing” technique which has proven to be highly effective in helping people control arousal levels in high stress situations (Hume, 2001).

Besides training investigators in all the issues outlined above, it is also important to train officers and their family members on what reactions they can expect during and after high stress situations such as shootings. When I first started doing debriefings, I was astonished at the confusion and shame that many officers felt about the normal emotional reactions and normal perceptual and memory distortions they had experienced during and after shootings. This also contributed to problems with family members who also didn’t understand what the officer was going through. I was dismayed to learn that no one had taught them ahead of time that these are normal reactions and, in fact, that’s what launched my law enforcement training career. Providing officers and their family members with what to expect is a form of Stress Inoculation Training that can help them cope better with highly stressful events (Meichenbaum, 1985)

Officers, their families, and investigators are not the only players in an officer involved shooting. All the other players, including district attorneys, union reps and attorneys, defense attorneys, peers, juries, the media, command staff, supervisors, mental health professionals, EAP's, workers comp systems, and anyone else who has a vested interest in these events also need to be educated about the psychological and biological dynamics of shootings and other high stress situations. This will better enable them to make informed, reasonable judgements of the officers' behaviors and advocate for the type of training and post-incident care the officers will need to best serve and protect their community.

\* \* \*

*About the Author:* Dr. Artwohl, co-author of the book *DEADLY FORCE ENCOUNTERS*, is a retired police psychologist who continues to provide law enforcement training throughout the USA and Canada. She can be contacted at [artwohl@cs.com](mailto:artwohl@cs.com) and you can visit her website at [www.alexisartwohl.com](http://www.alexisartwohl.com).

### References

- Artwohl, A. & Christensen, L.(1997) *Deadly Force Encounters: What a Cops Need to Know to Mentally and Physically Prepare for and Win a Gunfight*. Boulder, CO: Paladin Press.
- Epstein, Seymour (1994) The Integration of the Cognitive and Psychodynamic Unconscious. *American Psychologist*, 49,709-723.
- Fisher, R.P. & Geiselman, R.E. (1992) *Memory Enhancing Techniques for Investigative Interviewing*. Springfield, IL: Charles C. Thomas
- Humes, Charles.(2001) Lowering Pursuit Stress. *Police*, June 2001.
- Humes, Charles (1992) The Flashlight Dilemma, *Tactical Edge*.
- Klinger, David (In Review) *Police Responses to Officer-Involved Shootings*. Washington, D.C.: National Institute of Justice.
- Grossman, D. & Siddle, B.K. (1998) *Critical Incident Amnesia: The Physiological Basis and Implications of Memory Loss During Extreme Survival Stress Situations*. Millstadt, IL: PPCT Management Systems, Inc.
- Honig, A.L. & Roland, J.E. (1998) "Shots Fired: Officer Involved." *The Police Chief*, October, 1998.
- Lewinski, Bill. (2000) Why is the Suspect Shot in the Back? *The Police Marksman*, November/December, 2000.
- Meichenbaum, D. (1985) *Stress Inoculation Training*. Boston: Allyn & Bacon
- Solomon, R.M. & Horn, J.M. (1986) Post-Shooting Traumatic Reactions: A Pilot Study, in Reese, J.T. and Goldstein, H.A. (eds). *Psychological Services for Law Enforcement*. Washington, D.C.: U.S. Government Printing Office

### **Training Resources**

Dr. Ron Fisher is a Professor at Florida International University and provides training, expert witness testimony, and will interview cooperative witnesses in “interesting cases”. He can be reached at: E-mail: fisherr@fiu.edu or phone: 305-919-5853.

Lt. Col. Dave Grossman (Ret.) is a Professor at Arkansas State U. He provides training and can be reached at: E-mail: ltcoldaveg@aol.com or his website: www.killology.com

Sgt. Charles E. Humes Jr. is Director of the Police Institute of Tactical Training. He provides training and can be reached at E-mail: nodonuts@aol.com or website: http://hometown.aol.com/nodonuts.

Dr. Dave Klinger is an Associate Professor at the University of Missouri. He provides training can be reached at: E-mail: klingerd@msx.umsl.edu.

Dr. Bill Lewinski is a professor at Minnesota State U. and provides training and expert witness testimony. He can be reached at: E-mail: william.lewinski@mankato.MSUS.EDU or phone: 507-387-1290.

Bruce Siddle is Executive Director of the law enforcement training company PPCT and can be reached at: E-mail: PPCT100@aol.com or phone: 618-476-3535.

REFERENCE TABLES FOLLOW THIS PAGE. SEE BELOW.

**AELE Workshop  
The Legal, Psychological and Biomechanical  
Aspects of the Use of Lethal and Less Lethal Force**

**Perceptual Distortions**

Reference tables for Dr. Alexis Artwohl’s presentation

“... incidents in which the officers do not remember discharging their weapons will continue to be a fact of life for law enforcement ... When officers have failed to remember having a weapons discharge, it is a mistake to automatically assume that the officer must be lying. There is ample psychological research which shows that memory gaps and distortions are a normal part of critical incidents.”

— Alexis Artwohl, "No Recall of Weapon Discharge."  
3 (2) Law Enforcement Executive Forum 41-49 (2003)

**Table 1**

**“Perceptual and Memory Distortion During Officer-Involved Shootings”  
Alexis Artwohl, Ph.D. • 71 (10) FBI Law Enf. Bulletin 18 (Oct. 2002).**

%	Officers’ perceptual distortions during shooting incidents (n = 157)
62 %	Slow motion
17 %	Fast motion
79 %	Tunnel vision
71 %	Heightened visual clarity
84 %	Sounds diminished
16 %	Sounds intensified
74 %	Responded on “auto pilot” (little or no conscious thought)
52 %	Memory loss for part of the event
46 %	Memory loss for some of their own behavior
39 %	Experienced dissociation (sense of detachment or unreality)
26 %	Had intrusive, distracting thoughts
21 %	Memory distortion (did not happen or happened very differently)
07 %	Temporary paralysis

**Table 2**

**“Under Fire - Reactions and Resilience: What an Officer Can Expect!”  
by Audrey Honig, Ph.D. and S. Sultan, Ph.D. • Police Chief, Dec. 2004**

<b>2004</b>	<b>1998</b>	<b>Total % of subjects experiencing some perceptual disturbance</b>
<b>89 %</b>	<b>90 %</b>	<b>During the incident</b>
<b>51 %</b>	<b>51 %</b>	<b>Sounds were quieter</b>
<b>42 %</b>	<b>45 %</b>	<b>Tunnel vision</b>
<b>40 %</b>	<b>41 %</b>	<b>Noticed increased attention to detail</b>
<b>40 %</b>	<b>41 %</b>	<b>Time slowed down</b>
<b>19 %</b>	<b>20 %</b>	<b>Time sped up</b>
<b>20 %</b>	<b>22 %</b>	<b>Memory loss for part of the incident</b>
<b>21 %</b>	<b>23 %</b>	<b>Sounds were louder</b>
<b>59 %</b>	<b>55 %</b>	<b>Feeling a little helpless</b>
<b>23 %</b>	<b>24 %</b>	<b>Feeling moderately helpless</b>
<b>17 %</b>	<b>21 %</b>	<b>Feeling completely helpless</b>
<b>47 %</b>	<b>48 %</b>	<b>Flashbacks</b>
<b>42 %</b>	<b>41 %</b>	<b>Intrusive recall</b>
<b>31 %</b>	<b>27 %</b>	<b>Nightmares</b>
<b>48 %</b>	<b>53 %</b>	<b>Sense of vulnerability</b>
<b>53 %</b>	<b>56 %</b>	<b>Heightened sense of danger</b>
<b>42 %</b>	<b>41 %</b>	<b>Fear of future situations</b>
<b>34 %</b>	<b>32 %</b>	<b>Increased startle response</b>
<b>19 %</b>	<b>16 %</b>	<b>Increased alcohol use</b>
<b>36 %</b>	<b>35 %</b>	<b>Physical distress</b>
<b>35 %</b>	<b>34 %</b>	<b>Concentration problems</b>
<b>41 %</b>	<b>38 %</b>	<b>Sleep disturbance</b>
<b>31 %</b>	<b>27%</b>	<b>Avoidance of thoughts associated with event</b>
<b>39 %</b>	<b>41 %</b>	<b>Anger or rage</b>
<b>31 %</b>	<b>30 %</b>	<b>Guilt</b>
<b>49 %</b>	<b>51 %</b>	<b>Legal concerns</b>
<b>23 %</b>	<b>20 %</b>	<b>Decreased performance</b>
<b>22 %</b>	<b>20 %</b>	<b>Over reacting</b>
<b>22 %</b>	<b>20 %</b>	<b>Under reacting</b>
<b>40 %</b>	<b>41 %</b>	<b>Family problems</b>

**Table 3**

**“Responses to Officer-Involved Shootings”**  
David Klinger, Ph.D. • NCJ 192286 (2001).  
NIJ Journal No. 253 • January 2006

<b>At any time</b>	<b>Prior to firing</b>	<b>Upon firing</b>	<b>Officers' perceptual distortions during shooting incidents (n = 113)</b>
<b>51 %</b>	<b>31 %</b>	<b>27 %</b>	<b>Tunnel vision</b>
<b>56 %</b>	<b>37 %</b>	<b>35 %</b>	<b>Heightened visual detail</b>
<b>15 %</b>	<b>10 %</b>	<b>11 %</b>	<b>Both visual distortions</b>
<b>82 %</b>	<b>42 %</b>	<b>70 %</b>	<b>Auditory blunting</b>
<b>20 %</b>	<b>10 %</b>	<b>05 %</b>	<b>Auditory acuity</b>
<b>09 %</b>	<b>00 %</b>	<b>09 %</b>	<b>Both aural distortions</b>
<b>21 %</b>	<b>21 %</b>	<b>23 %</b>	<b>Sounds were louder</b>
<b>56 %</b>	<b>43 %</b>	<b>40 %</b>	<b>Slow motion</b>
<b>23 %</b>	<b>12 %</b>	<b>17 %</b>	<b>Fast motion</b>
<b>02 %</b>	<b>00 %</b>	<b>02 %</b>	<b>Both time distortions</b>
<b>13 %</b>	<b>06 %</b>	<b>09 %</b>	<b>Other</b>
<b>95 %</b>	<b>88 %</b>	<b>94 %</b>	<b>Total</b>

Updated 12 April 2008