



The Science of Training

with [David Blake](#)

What agencies need to know about the limitations of body cam technology

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Police body camera technology has become a hot topic — both in law enforcement and the media — with many believing cameras will solve the statistically unsupported problem of common use of excessive force in policing.

Studies and reviews already show some of the positive results of deploying cameras, but some in law enforcement are concerned about the lack of knowledge and education on the differences between the mechanisms involved — the human and the camera. Each sees, processes, and recalls information differently.

For this reason, it is vitally important to understand the differences before using camera footage in UOF/OIS investigations. The ramifications for not doing so include incorrect disciplinary actions, increased liability, and incarceration.

Physiology of the Human Visual Experience

We must first look at the field of view (FOV) of the body cameras and compare them to human visual capabilities. Body cameras provide anywhere from a 95 to a 170 degree FOV. In human vision, the normal useful field of view (UFOV) is the area over which information can be extracted at a brief glance, without eye or head movements. Under optimal, normal stress, the visual field of attention is 55 to 60 degrees.

Within its FOV, the camera can provide HD quality playback of everything within its viewable angles. The physiology of the eye ensures a similar HD version of acuity is only available within the 1-2 degree angle of the Fovea, with vision sharply decreasing towards the periphery. The differences here ensure the camera will “see” and record more of an event in much higher quality than what a human is capable of.

As we progress through the mechanical differences, we must look to the cognitive concept of human “attention.” While a camera lens is a stable mechanism, the eye is in constant motion, and scans the environment about three times every second. These rapid eye movements are called visual saccades.

Saccades provide near foveal vision of the environment, but must fixate on an object for a minimum of 100 milliseconds in order for the brain to perceive and store information. This form of sampling is called visual attention. Because humans only ‘visually attend’ to environmental aspects based upon need, we may not perceive or attend to other aspects, even if they are within our visual field. Additionally, the subconscious brain rejects significant amounts of incoming bandwidth, sending only a small fraction of its data to the conscious brain.

While the camera has “global attention” and will record all the data from its FOV on film to be viewed later, human physiology is not recording the same level of data to be stored in memory. This scientific fact provides that human perception and memory of an event can be dramatically different than that prescribed by the camera. This factor increases substantially when the stress and arousal of an UOF/OIS event is included.

Stress, Arousal, Vision, and Memory

The United States Supreme Court ruling in *Graham v. Connor* provides that evidence of reasonableness must include the officer’s perception of the event during “tense, uncertain, and rapidly evolving events” and not through “20/20 hindsight.”

When considering the “20/20 hindsight” provided by camera evidence, it is imperative to understand the difference between the visual acuity and perception of a human being. Visual acuity is the clarity of vision, the ability to detect and see the fine detail. Perception involves the process of not only detecting an object, but also comprehension of the object's significance. A camera may have perfect visual acuity, but it has no perception whatsoever — only the human brain can perceive and process the significance of the incoming data. Only the human can experience subsequent stress and arousal.

UOF/OIS incidents are chaotic and violent, typically causing high levels of arousal, activating the limbic system’s fight or flight mechanisms, in turn causing the release of hormones and neurotransmitters throughout the body. Stress and arousal cause our UFOV to narrow (peripheral narrowing). Under extreme stress, our field of view can narrow to 1/20. Peripheral narrowing and selective attention will cause the individual to not perceive or remember other aspects of the encounter that a camera would capture.

What a human under acute stress sees, hears, and feels, along with the perspective from previous training and experience, provide context to a UOF/OIS event and are all outside the ability of a camera to reproduce. One cannot recreate perspective, stress, arousal, and attention with a camera.

Cameras provide a reenactment of events from a mechanical view, unaffected by stress, producing images on film in a linear fashion for replay. Memory is a weave of events and experiences, stored in different areas of the brain and tenuously attached to one another. In the human, cortisol is released during high stress situations, which has severe effects on memory, blocking pathways and ensuring a memory is stored in a fractionated manner, or in some cases never stored at all. The camera transfers its view into digital media with no cortisol impediment. An officer who doesn't remember, or who has an account different than the camera provides, will fight an uphill battle against those who are uninformed.

Recommendations

Body camera technology is the wave of the future in law enforcement — many agencies are already demonstrating their many positive contributions. As your agency deploys this new capability, consider the following:

1. Law enforcement (at all levels) should receive education in the science of human behavior/human performance as it has proven method to reduce departmental liability, and to save officers from criminal prosecution or unwarranted discipline.
2. Law enforcement agencies should test body cameras in reality based training environments while comparing officer memory to after action review of video footage.
3. Law enforcement agencies should allow officers to view video of use of force incidents prior to writing reports.

As with all new technologies, there will be growing pains and learning curves. However, in the most severe of cases — when careers are on the line and hefty civil penalties wait on the sidelines, we must educate ourselves on these new devices with a sense of urgency that mimics their rapid deployment. The ramifications of not doing so could be extensive to both individual officers and the entities that employ them.

About the author

David Blake is a retired California peace officer and certified Ca-POST instructor in DT, firearms, force options simulator and reality-based training. His experience includes SWAT, force option unit, field training, gangs/narcotics and patrol. He is a certified Force Science Analyst and teaches the Ca-POST certified courses entitled Force Encounters Analysis and Human Factors: Threat & Error Management for the California Training Institute. He also facilitates the Ca-POST Force Options Simulator training to tenured officers from multiple jurisdictions. Dave is an expert witness/consultant in human performance and use of force.

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