Sierra Training Associates
24645 Foresthill Road, Foresthill, CA 95631 530–333–3349 http://www.sierra-training.com

# The Speed of the Game: Your Brain on Policing

By: Bob Harrison

One of the most prevalent comments of athletes who move from college to professional football is not about the complexity of the competition, nor about the athleticism of those with whom they now share the inner sanctum of sports. It is more often about the speed of the game. Moving from a game tempo that seems pretty intense to spectators, newly-minted pros see and feel action that, as compared to their previous experience, seems to flash by in a blur. Beyond learning the playbook, moving at the required pace and speed is something coaches and scouts try to forecast, but never know until the competition is real.

For those in policing, we experience much the same thing as we move from the confines of academy training to the reality of life in a patrol car. Unfortunately, much of what we might have learned has been presented in a fashion that does not test what is perhaps the most important aspect of our survivability in the craft; the ability to perceive, recognize and react in a timely manner in the street. Fortunately, emerging findings in brain study give us some significant clues about how to train more effectively. Beyond knowing things, the emphasis should be on "knowing and feeling" at the "speed of the game."

## Your Brain–A Primer

With more than 100 billion neurons, all connected to one another in a dizzying and changing array of ways, the human brain operates in a manner we are just now beginning to understand. Throughout history, we have sought to understand the full functions of our brain, that three-pound lump of flesh residing between our ears.

Philosophers and scientists since Aristotle have pondered the way in which the brain interacts with our bodies. Some saw it as two as separate entities (if you've ever said "my arm is killing me," you have done the same). At one time, the brain was considered the center of thought, while the heart (or other organs) held one's emotions and feelings. Some thought there must be a "brain within the brain" which could comprise our personalities and souls. Even today, Rene Descartes' conclusion that, "I think, therefore, I am" rings true in the minds of many. Unfortunately, Descartes was wrong.

Recent studies have uncovered a complexity in the brain we can scarcely imagine. Damasio (1999) proposes that the reasoning system evolved as an extension of the automatic emotional system, with emotions playing an integral role in the process of reasoning and action. Researchers at the University of California, Irvine found that a single brief memory is actually processed differently in three separate areas of the brain; one area for context (the hippocampus), one to retain unpleasant stimuli (the cingulate cortex) and a third to consolidate the memory and influence how it will be stored (the amygdala, which controls the "fight or flight" response) (Malin & McGaugh, 2005). With the emergence of computers, we might like to believe the human brain is the model for the mainframe, running on a series of ones and zeroes to make decisions and engage in rational thought. In truth, it is not.

The brain is remarkably more complex than even the fastest mainframe. This may be why we have such difficulty recreating its functions in artificial intelligence. It holds the sensory properties of maps, arrays and objects, including their color, texture and speed. The long-standing myth is we use only ten percent of our brain. Since any organ left unused will inevitably atrophy, it becomes clear the brain - all of it - is active and working in ways we just don't understand. For those who may work in predictable, static environments, the manner in which the brain drives our actions may not make a significant difference in its response to novel circumstances. In policing, where decisions are often made in microseconds with incomplete and unknowable considerations, understanding the thinking-feeling relationship can be the difference between successful and unsuccessful outcomes. Of course, "unsuccessful" may mean the brain and body won't have another chance.

Most cognitive functions (e.g. thinking) involve interactions from many parts of the brain simultaneously, working from metaphor and meaning rather than "fact." According to John Ratey (2002) a Harvard psychiatrist, the dynamic ecosystem of the brain is a battleground of various neurons and networks, each vying vigorously for incoming stimuli. Networks successful in processing our experiences become stronger and thrive. Those cut off wither and die. The structure of the brain guides what it receives and how it perceives what comes in. This shapes not only one's response to any given stimuli, but the memories and future actions of the brain. Those "memories" left untended lose their connection to the network, which is why knowledge without practice and reinforcement becomes useless in short order. Those inputs charged with an emotional context are remembered more clearly than others. That may mean a quicker response to adverse stimuli in future similar circumstances. It might also mean we could be literally "blind" to that which we have not yet emotionally experienced.

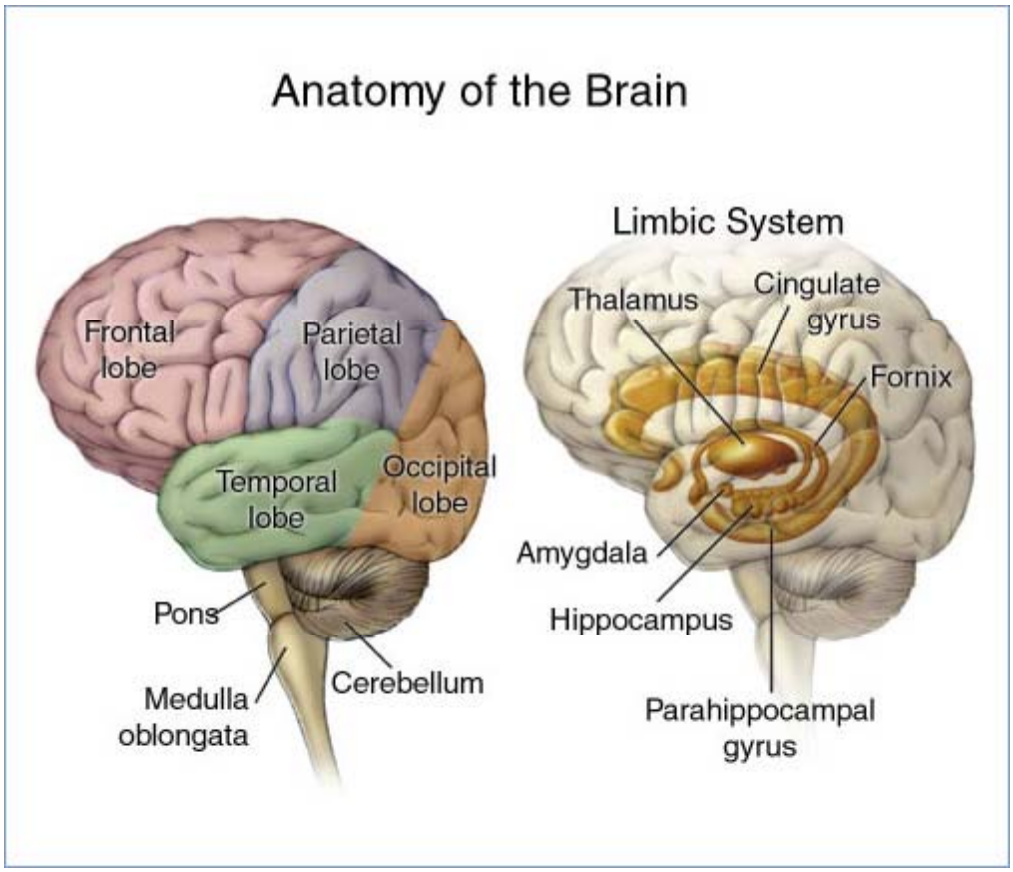
In many crafts and professions, that could translate to a loss of efficiency or an opportunity to re-train. In policing, however, the lack of a well-constructed network of cognition, emotion and action may lead to injury or death. How, then, can we prepare those who undertake the mission of policing to succeed when it counts most? The answer may lie in how the amygdala affects and controls what we might do, and how well we respond to threats in our environment.

**The Amygdala**

Coming home late at night, have you ever been startled by a shadowy figure, the rustling of leaves or something else that just doesn't "feel right"? Even when the shadow is seen as the neighbor's cat, the "threat" as little more than your imagination, you still felt that tingling sensation, the acceleration of your heartbeat, the quickness of breath. Most likely, the first rush of perception caused you to momentarily freeze, and then to fight the urge to move faster, even run, to a position of safety (LeDoux, 1996). Certainly, when faced with the expectation of a real threat (whether physical or metaphorical), the same emotional responses flood the system. Honed through thousands of generations, the brain-body connection seeks to survive. The "early warning system" essential to that survival is the amygdala.

The amygdala (from the Greek 'almond') is a pair of almond-sized areas in the temporal lobe of the brain (see Figure One). Interestingly, the amygdala's functions occur below (and more quickly than) conscious control, and are linked to everything from visual stimuli to the release of adrenaline as the body prepares to fight for survival. When the body perceives threat, the amygdala kick into action; comparing present circumstances to stored memories, 'assessing' threat almost instantaneously and starting a flood of internal events aimed at mitigating whatever is perceived as hostile. Adrenaline and noradrenaline (which are responsible for the 'jolt' you feel first when unanticipated fear arises) constrict blood vessels and prepares our smooth muscle fiber (LeDoux, 2002).

Figure 1: Anatomy of the Brain




Medical illustration courtesy of Alzheimer's Disease Research, a program of the American Health Assistance Foundation
http://www.ahaf.org/alzdis/about/adabout.htm

This swift kick of fear also results in the secretion of cortisol into the system, suppressing higher brain function and diverting energy into the possible physical

response. The digestive system shuts down and our past experiences form a foundation from which the amygdala will dictate our response (LeDoux). Unfortunately, as well as this system has worked for the millennia in our development, it can also shut down our capacity to respond appropriately to unfamiliar circumstances or change our response as an event unfolds.

In *Deep survival: Who lives, who dies, and why*, Laurence Gonzalez (2005) describes the neural process that allows a fighter pilot to steer his plane into a collision with the "round down" (the back of the boat just below the deck; not a life-enriching event). The stimuli created by attempting to land on a heaving deck in the middle of the ocean inevitably results in a level of fear; fear for safety and an instinctive fear of the outcomes of one's decisions. Landing on a carrier, as aviators would say, is "like a knife fight in a phone booth" (p.29). The hormones dumped into the body due to this stress literally distort perception, thinking and the retrieval of memories to help guide conscious choices. The greater the excitement to the amygdala, the more likely one's responses will enter a fatal funnel of dampening conscious memory, even while creating and recalling unconscious memories with greater effectiveness.

As fear rises, primary cognitive processes and emotions give way to the amygdala, producing a "hostile takeover of consciousness by emotion" (Gonzales, 2005, p.37). Even pilots with a strong memory of the relief created with a successful landing rarely have a memory of what happens when the plane is too low or traveling too slowly. The fear of landing suppresses the cognitive recognition of the alternative, inhibiting the very response that would save the pilot's life. The obsessive, emotional focus on "getting down," propelled by the increasing fear and its continued dump of hormones suppressing thought, results in an outcome contrary to the body's goal; a ramp strike and probable death.

Gonzalez (2005) notes a host of other circumstances where fear and the amygdala "conspire" to kill. Divers who drown with their regulators pulled from their mouths even with air still in their tanks (the body's instinctive fear of having its mouth covered); mountain climbers who ignore overt danger signs just before falling to their deaths. Experienced climbers, like veteran pilots, may have lacked an emotional 'memory' from which to sense the impending danger. They may even have engaged in deliberate actions

consistent with past success that led to their deaths in different circumstances. Like the aspiring pro athlete, the "speed of the game" overwhelmed conscious thought. The amygdala then hijacked the primary emotional responses, and each person Gonzales studied perished in instances where others have survived.

Certainly, too, peace officers face the possibility of meeting threat head-on. In fact, it is the essence of our job. Given that we also possess similar bodies and brains to those of fighter pilots, mountain climbers and others, what can we do to help control the destructive outcomes of fear? How might we respond to unknown dangers lurking just beyond arrival at the next radio call? There may be no hard and fast answers. There are, however, ways one can manage the natural emotions of fear and anxiety to enhance the chances of survival in an incident of life and death.

**The Counterintuitive Response**

Through the decades of police training, much attention has been given to the psychomotor skills (running, shooting, driving) and the cognitive skills (thinking, memorizing facts and data, learning case and statute law). Contemporary training also quite often incorporates simulation technologies to hone decision-making skills in "shoot-don't shoot" use of force training. At seemingly endless points along the way, recruits are tested, assessed and observed. At the same time, many police academies are also filled with hours upon hours of classroom lecture.

Passively watching Power Point after Power Point, the 'technotainment' approach to 'canned' lectures, qualifies recruits to pass pen and paper tests. Does it also prepare them to act counterintuitively in stress to make the right choices when it really counts? Unless training is framed to create and sustain memory in the amygdala, the answer may be "no." Even with recent efforts to incorporate active adult learning into the academy curriculum, much of the training in police academies may fall short of preparing a recruit for the rigors of life on the streets.

Without such exposure the trainee may not experience and ingrain memories sufficient to transfer that learning to the field. Considering the hours spent in lecture and similar static modes of education, any relevant training might easily be lost in a sea of facts and data memorized for pen and paper testing. What factors, then, should be considered when preparing a police officer for the rapidity and complexity of decisions

she or he will have to make in the fluid environment of law enforcement? Considering the function of the brain, and the setting within which policing takes place, there are two factors of critical importance:

- To recognize the brain's impact on perception and reaction
- To recognize the brain's impact on choice and response

To be effective, any initial and continuing training in policing must take both factors into account.

**Recognize the brain's impact on perception and reaction**

The popular myth of cool and rational decision-making is just that, a myth. In fact, we perceive and react to almost all external stimuli through a complex set of emotions and memory patterns that have little to do with logic, thinking and conscious deliberation. Our implicit memories control much more of what we do than any explicit memory as a guide to action. The less time we devote to preparation, practice and deliberate flexibility in the range of our possible responses, the more likely it is we will fail to do so appropriately. An old adage states we don't defend against that which we don't believe can happen. The terror attacks on 9-11 are a good example of that, as are countless stories throughout history of defeat in the face of novel tactics. The amygdala receives visual, auditory and sensory information more quickly than the conscious brain. All stimuli from the senses goes to the amagdala first; they kick-start a myriad of physiological responses well ahead of our awareness.

If unprepared, that rush of hormones will overwhelm our senses and lead to under- or over-response to any potential threat. Officers who freeze, or fail to take cover when in a field of fire, are examples of responses seen when adrenaline and cortisol inhibit thinking and decision-making. Lashing out with excessive force to mitigate a threat is another. In both circumstances, the body has quickly taken action in an intuitive way, one designed to survive at all costs. The natural, untrained response actually interferes with the officer's ability to constrain behaviors that are generally effective, but inappropriate in the specific instance. Until peace officers are taught how their brains work, and how to recognize and respond to the influences of their systems, incidents such as these will continue to occur.

**Recognize the impact of the brain on choice and response**

Evidence in numerous life-and-death incidents involving peace officers indicates some perceive, recognize and respond in seeming lightening-quick ways. Facing similar threats, others freeze, disbelieve and die. There is no doubt the ones who survive such circumstances rely on training and deliberation of the "what if…" discussions they have held with others or in their own minds. Those who may suffer from a "misdemeanor mentality" where "nothing big" could ever happen, are overwhelmed by the swift and decisive actions of their adversaries and fall well short of what is required. Surely, experience may be the best teacher. Without previous exposure to one's life being threatened (like the fighter pilot who has the good fortune of never having had a ramp strike), what considerations should be in one's mind? There are no hard and fast rules to govern every situation. There are, however, three simple rules of behavior one can consider that are common to survivors through the ages.

1. **Perceive, don't disbelieve** – survivors understand the brain-body system is accessing information constantly, and that it will react to input seen as a possible threat well before we are consciously aware of it. That knot in the pit of your stomach is the ganglial nervous system alerting itself to possible threat. Same goes for the hair rising on the back of your neck. These, and more, are clues your perceptual system is sending to warn of a change in the environment. In training settings, become aware of when these systems are active, and reflect on what they feel like in stress. Survivors develop an implicit memory of those feelings and rely on them to stay a step ahead of potential danger.
2. **Recognize and react** – survivors accept the reality of their circumstance. They immediately begin to "recognize, acknowledge and accept" the new reality. Although they might initially blame external forces, they move quickly past denial and anger to "go inside" themselves (Gonzales, 2005, p.287). When a traffic stop degrades into a subject emerging from a car with a handgun, the first reaction might be "this can't be happening…" Unfortunately, that might also be a cop's last reaction. Survivors accept the circumstance, and make use of the fear response generated by the amygdala. Some report the fear often "feels like and turns to anger" which sharpens the senses and motivates the response (Gonzales,

p.287). At the same time, control of the adrenaline response produces calmness in actions, even as they might come in rapid succession. In fact, conditioning in brain-aware training stimulates a "motive state" in the brain characterized by coordinated information processing across regions and the guidance of behavior towards positive goals and away from adverse ones (LeDoux, 2002). It creates the capacity for responses consistent with success.

3. **Flexibility: The Initial Response** – it has been said the essence of stupidity is to repeat the same action again and again hoping for a different result. The same may be said for surviving significant threat. In the split-second scenario of many officer safety incidents, the first reaction (beyond perception, disbelief and recognition) may first be defensive. The defense may be to take cover, move to a position of advantage, to blade one's stance or to engage physically to stop an aggressor's actions. The defensive reaction is more autonomic; it seems to happen below conscious control. That is where training may be best applied to survivability. Training that encourages flexibility, extension and reframing the setting to gain advantage is the first necessary step to success. In almost every circumstance, decisive defensive action will enhance survivability. Once defenses have been addressed, though, appropriate offensive responses then must take place.

**Response and Resolution**

In policing, the nature of the job dictates resolving threatening circumstance, not just defending oneself from aggression. That requires specific training that encompasses both cognitive and emotional systems to form an effective response. The use of force, firearms and emergency driving are concepts that need to be internalized as governing mechanisms in the implicit memory. Knowing them, though, is not enough.

Survivors will sustain their response until no more choices are available. They will tend to explore and act on possibilities other might see as fruitless, or even actions that only extend the situation rather than ending it. Facing setbacks, the response is a quick reframe with differing approaches, not to try the same tactic again and again. One possible application for police training may be to ensure training is both "hands on" and "minds on" so cognitive systems and the physical-emotional response are attuned to deal

effectively with novel circumstances. Rather than conditioned training in many "shoot-don't shoot" scenarios, the encouragement would be to replicate the dizzying array of possible responses in the field. Threatening scenarios should have possible solutions ranging from persuasive speech to deadly force, with a realistic range of possibilities in between. Static training, except for settings to prompt the learning of critical thinking, should be scrapped in favor of varying and ever-increasing levels of challenge to the abilities necessary to succeed in policing. Most important amongst these are:

- To act on incomplete information
- To speak persuasively, especially to those adverse to the police presence
- To respond calmly and quickly to novel or emerging circumstances, and,
- To counter instinctive structures in the brain to achieve success, especially during incidents of threat

Motivation to succeed in any particular setting is "a neural activity that guides us to our goals, during which we will either exert effort to achieve outcomes or to prevent, escape or avoid that which we dread" (LeDoux, 2002, p.236). Some, like thirst, hunger or fear of harm, are intrinsic motivations. Others are extrinsically acquired through training or exposure (p.236). The arousal of motivation to produce goal-oriented behaviors is what allows us to engage an adversary rather than running away. Running might be intrinsic (protect self), while engagement satisfies a learned extrinsic goal of protection, a core value for those in law enforcement. Unless training specifically addresses the emotional structures sufficient to embed the motivational response, one's actions may be a result of happenstance more than from any rote training. Given time, most can think of what to do. Lacking time (which is the most precious commodity in any evolving incident), only that with which one is already prepared will be available during the situation itself.

## Where to from here?

The nineties was termed by some as the "Decade of the Brain." There are sources available to develop a much deeper understanding of how the brain works. They may also be used to understand how its impact on our actions might be altered if training truly took

the brain into mind. Moving such concepts from neuroscience to law enforcement, though, will mean elevating the discourse on what "training" is intended to achieve. It may also alter the way we will facilitate professional education. It is true much more needs to be known about exactly how our brains work. What is already known, though, is evidence enough the "old ways" of training are insufficient to prepare peace officers for the full spectrum of challenges they will face.

So, how to train "at the speed of the game" might be the first challenge to address. Damasio (1994) encourages the development of secondary emotions to counter the possible adverse impact of the "primary emotions" generated by the amygdala and other areas of the limbic system (p.134). Gonzales (2005) urges us to recognize the bookmarks of past unpleasant events so their "elegant and seamless assistance" does not become a trap in unfamiliar territory, one where "memories of the future" play out in a conspiracy ending in our death (p.55). LeDoux (2002) notes that, once an emotional habit is well-learned, the amygdala no longer facilitates the fear response. Could focusing on training to create these "well-learned responses" be the key to preparing peace officers for their work? (p.251) Like any skill, speed of response to stimuli is prompted by learning concepts in an environment encouraging critical thinking and flexibility. As with other skills, practice in a cognitively-challenging yet safe environment allows for experimentation. The necessity of "failing forward" and ingraining alternatives into the amygdala and elsewhere might be a good place to start.

## Conclusion

At the end, we must consider; when those we have trained get into their "knife fights in a phone booth" will we have prepared them to succeed? Or will their brain hijack their response and leave the outcome to luck and chance? Gonzales (2005) once asked his father, a pilot shot down over Germany during World War II, how he ever got comfortable going into combat. "Don't get comfortable," his father advised. Get confident."(p.188) How, then do we build confidence without comfort for those who will rely on what they were taught. What structures will we build to help survive at the speed of the game?

## References


Damasio, Antonio. (1994). *Descartes' error*. New York: Penguin Books.

Damasio, Antonio. (1999). *The feeling of what happens*. San Diego, CA: Harcourt, Inc.

Gonzales, Lawrence (2005). *Deep survival: Who lives, who dies, and why*. New York: W.W. Norton & Company

LeDoux, Joseph. (1996). *The emotional brain*. New York: Simon & Schuster Paperbacks

LeDoux, Joseph (2002). *Synaptic self*. New York: Penguin Books.

Malin, E.L. & McGaugh, J. (2005). "Differential involvement of the hippocampus, anterior cingulate cortex, and basolateral amygdala in memory for context and footshock." Retrieved April 16, 2007, from http://www.pnas.org/cgi/content/full/103/6/1959

Ratey, John J. (2002). *A user's guide to the brain*. New York: Vintage Books.



Bob Harrison is a consultant and trainer with more than 33 years in law enforcement positions. After retiring as a Chief of Police, Bob worked with the CA Commission on POST to develop and deliver training to transform that state's police academies to active adult learning. He also consults on topics as diverse as leadership, the gamers and the changing workforce and communications skills. He is affiliated with Sierra Training Associates; for more info, contact Bob directly at bobharrison@cox.net or www.sierra-training.com