The Freeze We Don't Plan For

Crisis behavior, decision-making under threat, and the case for combat training as a standard in the safety professions

Tim T. Nakamura, Psy.D.
Emergency Management and Behavioral Science

Abstract

Emergency preparedness is commonly built around the assumption that individuals will recognize danger, recall established procedures, and act rationally under pressure. Research in crisis psychology, however, suggests that acute threat frequently produces the opposite response: freezing, cognitive paralysis, narrowed perception, impaired working memory, degraded decision-making, and fear-driven overreaction. This paper examines the psychophysiology of acute threat and argues that the principal behavioral challenge in emergencies is often not mass panic, but the inability of otherwise capable individuals to function effectively when arousal overwhelms deliberate reasoning. Drawing on research in stress physiology, recognition-primed decision-making, stress inoculation, police performance, martial-arts training, and use-of-force behavior, the paper evaluates whether repeated exposure to realistic, controlled adversity can preserve performance under extreme stress. Particular attention is given to combat sports and grappling-based training as methods of repeatedly exposing participants to fear, physical pressure, loss of control, and adverse positions while requiring continued goal-directed behavior. Evidence from experimental police studies and field observations suggests that such training may improve composure, situational awareness, defensive performance, and force decisions under anxiety. Building on these findings, this paper proposes the Controlled Adversity Hypothesis: that the protective effect of combat training is driven primarily not by strength, fitness, or aggression, but by cumulative exposure to controlled experiences of losing while remaining functional. The hypothesis generates falsifiable predictions involving dose-response relationships, differences between combat disciplines, physiological mediation, and sustained training frequency. The paper concludes that continuous, control-based, adversity-rich training deserves serious investigation as a component of preparation for professionals responsible for protecting others during critical incidents, while emphasizing that the proposed mechanism remains experimentally unconfirmed.

Keywords: *crisis psychology, emergency behavior, freeze response, cognitive paralysis, decision-making under stress, stress inoculation, situational awareness, use of force, police training, Brazilian jiu-jitsu, active-threat response*

1. Introduction: the gap between the plan and the person

Most emergency plans are written for a person who does not exist. That person hears the alarm, recognizes the threat, recalls the procedure, and executes it. Real people, in the first seconds of real danger, rarely behave that way, and the distance between the planned actor and the actual one is where much of the harm in an emergency lives. I have spent much of my career on the planning side of that gap, building emergency operations plans, running evacuation and active-threat exercises, and coordinating campus preparedness, and I have come to believe that the weakest point in most systems is not the plan on paper but the nervous system of the person asked to carry it out.

One case has stayed with me because it states the whole problem in a single image. In August 1985 a Boeing 737 caught fire on the runway at Manchester Airport. The aircraft was on the ground, the exits were reachable, and yet 55 people died, many of them overcome by smoke while still in or near their

seats. Investigators and later researchers noted that some passengers sat immobile as conditions worsened, and the simulator studies that followed described volunteers as behaviorally inactive in the crucial window (Leach, 2004). No plan failed in the ordinary sense. People simply did not move.

That is the uncomfortable center of crisis psychology. We prepare as though the enemy is a panicking, stampeding crowd, when the more common and more lethal problem is the opposite: people who go still, quiet, and slow at the exact moment speed would save them. In the pages that follow I set out what is now known about how the mind and body actually behave under acute threat, why the freeze response deserves far more attention than mass panic, and how decisions are really made when there is no time to deliberate. I then turn to the training question that follows from all of it, and argue, from both the research and my own experience training and competing in boxing, Brazilian jiu-jitsu, and mixed martial arts, that sustained combat training belongs in the standard preparation of anyone whose job is frontline safety professionals whose duties include a meaningful likelihood of physical confrontation or high-arousal critical incidents.. I have tried to be clear throughout about which claims rest on solid measurement and which rest on reasoned inference, and I close with a prediction that could be tested and, if wrong, shown to be wrong.

2. What the body does when the threat is real

The physiology of acute threat is old, fast, and largely outside conscious control. Cannon (1915) described the sympathetic “fight or flight” mobilization more than a century ago, and Selye (1956) mapped the longer arc of the stress response, but the modern picture is broader than a simple two-way switch. Bracha (2004) argued that the acute stress response is better described as a spectrum, freeze, flight, fight, fright, and faint, with freezing as the common first move rather than an afterthought. When a threat registers, the body floods with catecholamines and, more slowly, cortisol; heart rate and respiration climb, blood shifts to the large muscles, and attention clamps onto the source of danger.

The cost of this mobilization is paid by exactly the machinery an emergency demands. High levels of stress neurochemistry impair the prefrontal cortex, the seat of deliberate reasoning, working memory, and impulse control, and hand influence to faster, more reflexive circuits (Arnsten, 2009). This is why a person can know the plan perfectly and still fail to use it: the part of the brain that holds the plan has, for a few crucial minutes, been turned down. The subjective side of this is well documented in people who have survived lethal-force encounters, who commonly report tunnel vision, auditory exclusion (sounds muffled or gone), time distortion, and patchy memory (Artwohl & Christensen, 1997). Perception itself narrows, so the field of view that a plan assumes is simply not available.

Motor control degrades in a predictable order as well. Fine, complex movements fail first, gross movements last, which is why practitioners often teach simple, large-muscle actions for high-arousal moments rather than intricate techniques. Some trainers cite specific heart-rate bands, with performance often described as best in a middle range of roughly 115 to 145 beats per minute and deteriorating badly above about 175 (Grossman & Christensen, 2008). Those exact numbers are commonly repeated and should be treated as a rough teaching heuristic rather than a precise law, but the underlying direction is not in dispute: the instrument you plan with is not the instrument you fight with, and the two diverge more the higher the arousal climbs.

3. The freeze nobody plans for

Leach (2004, 2005) gave the freeze response its clearest modern account. Reviewing survivor testimony and official inquiries from shipwrecks and aircraft emergencies, he described a cognitive paralysis in which the chain from perceiving danger to selecting an action stalls, because there is no ready-made response for the working memory system to reach for. Building a new plan from scratch is slow and effortful, and an emergency does not grant the time it needs, so the person simply stops. Roelofs (2017) has since shown that freezing is not mere shutdown but an active, attentive state, a parasympathetic brake laid over sympathetic arousal, that in ancestral environments bought time to assess before committing. The trouble is that a burning cabin is not an ancestral environment, and the pause that once preserved life now spends it.

The distribution matters as much as the mechanism. From his analysis, Leach estimated that in a serious emergency only about 10 to 15% of people stay collected enough to think and act effectively; roughly 75% become stunned and bewildered, with impaired reasoning and sluggish, almost automatic behavior; and a final 10 to 15% behave in frankly counterproductive ways, freezing outright, weeping, or screaming. Those figures are estimates drawn from qualitative testimony, not precise population statistics, but they invert the popular picture in a useful way. The modal emergency response is not the screaming stampede; it is the quiet, slowed, compliant majority who need to be moved.

Two related tendencies deepen the problem. The first is normalcy bias, the pull to interpret an ambiguous signal as ordinary, which shows up in building fires as long delays before anyone begins to evacuate while people finish tasks, gather belongings, or wait for someone else to react. The second is the myth of mass panic itself. Careful disaster research has found that wild, selfish panic is comparatively rare (Quarantelli, 1954; Clarke, 2002); people more often move toward the familiar, toward known exits and known companions, in what Mawson (2005) called a social attachment response, and strangers frequently cooperate rather than trample one another (Drury, Cocking, & Reicher, 2009). In groups the freeze can also be socially amplified: the presence of other apparently calm people diffuses responsibility and provides false reassurance, a version of the bystander effect (Latané & Darley, 1970), so that everyone waits for everyone else. Plans that brace for a panicking mob are preparing for the wrong failure. The real adversary is the frozen majority, and moving them is a behavioral problem, not a logistical one.

4. Deciding under fire

If deliberate reasoning is precisely what acute stress takes offline, then any model of good crisis performance has to explain how anyone acts well at all. The answer is that skilled responders do not, in the moment, reason in the classroom sense. Kahneman (2011) drew the familiar distinction between a fast, automatic System 1 and a slow, effortful System 2; arousal starves the second and leaves the first in charge. Klein (1998), studying firefighters and other experts, found that they rarely weigh options against one another. Instead they recognize the situation as an instance of a pattern they have met before and reach for the first workable action it suggests, a process he called recognition-primed decision making. Expertise, on this view, is a large library of pre-built patterns, and its great advantage under stress is speed: pattern recognition survives arousal in a way that deliberate comparison does not.

This reframes situational awareness, which Endsley (1995) described as perceiving the elements in an environment, comprehending their meaning, and projecting their near future. Each of those three levels is attacked by arousal: tunnel vision degrades perception, a narrowed working memory degrades comprehension, and a mind braced for the immediate threat struggles to project ahead. The person

without a stocked pattern library has nothing fast to fall back on and slides into Leach's paralysis; the person with one can act adequately before the situation is fully understood. The practical implication is stark and, I think, underappreciated in the safety professions. You cannot reason your way to speed in a moment that denies you time. You can only pre-load the patterns in advance and raise the arousal level at which you can still reach them. Both of those are training problems, and neither is solved by a slide deck.

5. Training as the variable that moves the curve

The relationship between arousal and performance has a familiar shape. More than a century ago Yerkes and Dodson (1908) described an inverted-U: performance improves as arousal rises, up to a point, and then falls away. The value of the curve for our purposes is not its precise form, which is more variable than the tidy version suggests, but what training does to it. Realistic, repeated exposure to controlled stress shifts the peak toward higher arousal and softens the collapse beyond it, so that the trained performer holds usable function in conditions that would flatten the novice (Figure 1).

Figure 1. Conceptual model of arousal, performance, and the moderating effect of training (schematic).

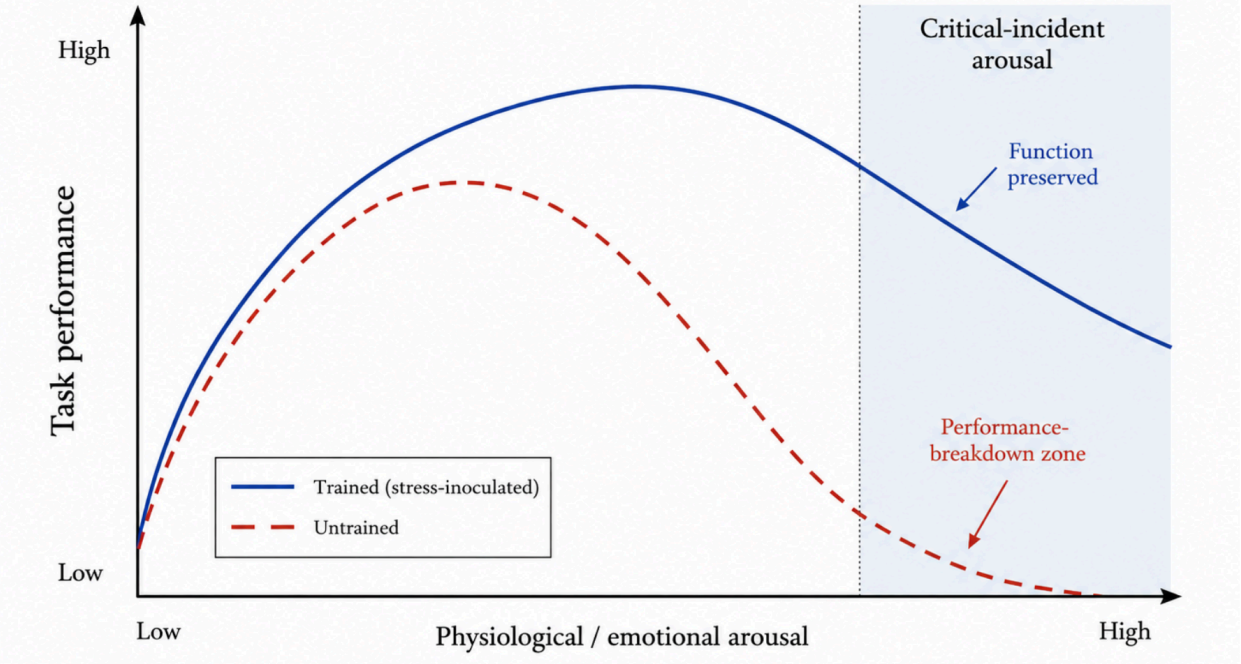

Figure 1. Conceptual model: *The arousal, performance relationship and the effect of training (schematic). Under the classic inverted-U, performance rises with arousal to a peak and then collapses. Untrained performers peak at a lower arousal level and fall early into the freeze and panic zone, whereas stress-inoculated performers peak later and hold usable function into the high-arousal band typical of a real critical incident. The figure is a conceptual synthesis of the stress and training literature rather than a plot of directly measured values." That eliminates a potential methodological criticism while leaving the figure intact.*

This is the logic of stress inoculation. Meichenbaum (1985) developed the idea clinically, and Driskell and Johnston (1998) built it into stress exposure training for high-risk work: graded, repeated exposure to the stressors of the real task builds both tolerance for the arousal and automaticity in the skill, so that performance no longer depends on a calm mind that an emergency will not provide. The evidence that this transfers is concrete. Oudejans (2008) found that police officers who practiced handgun shooting under genuine pressure, live and threatening rather than static and calm, shot markedly better under later

pressure, and related work showed that practicing with mild anxiety helps prevent choking under greater anxiety. The mechanism is exposure, not information.

This distinction carries a hard institutional lesson. A one-time certification, a lecture, or an annual block that is calm, brief, and unrepeated does not inoculate anyone, because inoculation requires reps under arousal. Yet certification-day training is exactly what most safety programs, including many I have worked within, actually deliver. If the goal is behavior that survives a real critical incident, the training has to look, feel, and stress the body like one, and it has to happen often enough to build automaticity. Frequency is not a luxury here; it is the active ingredient.

6. The case for combat training in the safety professions

If the goal is to inoculate a person against the freeze and against fear-driven overreaction, combat sport is close to an ideal delivery system, because it supplies the full interoceptive package of a violent encounter, contact, fear, physical exertion, air hunger, and the felt experience of losing, in a survivable and endlessly repeatable dose. Sparring and grappling are, in effect, controlled rehearsals of the exact bodily state that triggers paralysis in the untrained. The research on police performance, the most heavily studied group for these questions, supports the value of that rehearsal fairly directly.

What anxiety does to trained skill

A line of experimental work by Renden, Oudejans, and colleagues put officers through arrest and self-defence tasks under low and high anxiety. Under high anxiety, performance reliably worsened: officers became less able to hold a goal-directed plan and drifted toward stimulus-driven, avoidant responses (Renden et al., 2014). But officers with additional martial-arts training performed better under high anxiety than those without, even though everyone declined somewhat as anxiety rose (Renden, Landman, et al., 2015). Reflex-based self-defence training likewise improved performance in simulated high-pressure arrests (Renden, Savelsbergh, & Oudejans, 2017). The extra combat experience did not make officers immune to pressure; it raised the level of pressure they could absorb before their skills came apart, which is precisely the curve-shift of Figure 1.

Why the untrained overreact

The overreaction side of the ledger has an equally clear mechanism. Nieuwenhuys, Savelsbergh, and Oudejans (2012) found that anxious officers were more inclined to shoot, and made more incorrect shoot or don't-shoot decisions, because under anxiety they responded to threat-related expectations rather than to the objective visual information in front of them. Fear, in other words, does not merely make people slow; it biases perception toward danger and biases action toward the most decisive tool. This is the physiological heart of the complaint often leveled at police, that officers overreact, and it is worth stating carefully. Under anxiety, officers can become more threat-biased and more likely to make erroneous shooting decisions. The evidence therefore supports fear regulation as a training target, although it does not establish lack of combat training as the cause of those errors. The failure is built into the arousal response and left uncorrected by training, not a simple matter of character.

The corrective, encouragingly, is measurable. Andersen and Gustafsberg (2016) ran a randomized controlled trial of a program that taught officers to control their own physiology under critical-incident stress; the trained group showed better physiological control, better situational awareness, and, notably, made more correct use-of-force decisions than controls. Follow-up work found that modulating officers' physiology reduced lethal-force errors (Andersen et al., 2018). Training that lowers arousal reactivity,

then, improves decisions in both directions at once: it reduces the freeze and it reduces the fear-driven overreaction, because both grow from the same uncontrolled stress response.

A department-scale signal

The most striking real-world illustration comes from Marietta, Georgia. Beginning in 2019 the Marietta Police Department made Brazilian jiu-jitsu, a grappling art built on control rather than striking, mandatory for new recruits and available to all officers, and then compared use-of-force outcomes between officers who trained regularly and those who did not. By the department's own reporting, officers who trained saw roughly a 48% reduction in injuries to officers, a 53% reduction in injuries to the people they arrested, a 59% reduction in use-of-force incidents overall, and a 23% drop in taser deployments over an 18-month window (Marietta Police Department, 2021). The department's own explanation is telling: the training gave officers confidence that they could physically control a resisting person without striking, and an officer who is not afraid of losing a physical struggle does not need to escalate to reach for a weapon early. That pattern is consistent with the proposed composure mechanism, although the aggregate data cannot establish the mechanism itself.

A crucial distinction has to be drawn here, because "combat training" can mean two very different things. One is combat proficiency, the calm, options, and control that let a person meet a struggle without terror. The other is the "warrior" mindset, an ethos of aggression and domination that critics have argued makes officers quicker to use force, not slower. The evidence in this paper points toward the first and away from the second, and the point is not incidental. Grappling arts reduce force partly because they are built on control without striking, and because thousands of repetitions of being safely dominated teach a person to stay calm while losing, the single most useful emotional skill in a crisis. It is composure, not ferocity, that does the work. It should also be said plainly that training is necessary, not sufficient: use-of-force outcomes are shaped by policy, supervision, selection, culture, and bias as well, and no amount of jiu-jitsu will fix a broken system by itself.

What it changed for me

I can speak to the mechanism from the inside, because training changed how I meet danger, and not in the way people expect. It did not make me more dangerous or more eager for confrontation. It made me much harder to frighten. Years of boxing, jiu-jitsu, and mixed martial arts, including the particular education of an amateur boxing bout, meant that the felt state of a real confrontation, the adrenaline, the tunnel of attention, the closeness of another body, was not novel to me. I had lived in that state hundreds of times on the mat and in the ring, and a state you have visited hundreds of times does not paralyze you. A situation that, earlier in my life, would have spiked me into the familiar sequence of freezing and then overreacting instead read as ordinary, and because it read as ordinary I had time, and because I had time I had options, and the encounter resolved without force that a more frightened version of me might have used. Nothing about that is unique to me. It is exactly what the curve in Figure 1 predicts, lived out one person at a time.

7. A novel prediction: the Controlled Adversity Hypothesis

The literature above is consistent with a simple claim, but it does not isolate the active ingredient, and I want to state that ingredient in a form that can be tested and, if false, refuted. I propose what I will call the Controlled Adversity Hypothesis: the protective effect of combat training against both freezing and fear-driven overreaction is driven not by fitness, strength, or aggression, but by cumulative controlled exposure to losing, that is, by the accumulated hours a person spends being dominated, submitted,

struck, and forced to stay functional while things go badly. On this account, the mat's real gift is not that it teaches you to win. It is that it lets you rehearse the interoceptive experience of losing, thousands of times, in a form you survive, until that experience stops triggering paralysis or panic.

The hypothesis yields four falsifiable predictions, sketched in Figure 2. First, a dose-response: within combat-sport populations, hours of adverse-position exposure (time spent losing and defending, not time spent winning) should predict shorter freeze latency and lower premature force escalation in standardized threat paradigms, and should do so independently of aerobic fitness, strength, and total training volume. Second, a discipline gradient: at equal total hours, grappling arts that maximize safe repetitions of being dominated (Brazilian jiu-jitsu, wrestling, judo) should outperform striking-only or forms-based arts, which offer fewer survivable losing reps.

Third, a mechanism: the effect should be statistically mediated by reduced cardiovascular and cortisol reactivity and by preserved goal-directed control under threat, measurable through heart-rate variability and shoot or don't-shoot accuracy. Fourth, a regularity threshold: benefits should require sustained, roughly weekly practice rather than one-off exposure, predicting that mandated annual defensive-tactics blocks confer little protection while continuous programs confer a great deal, a pattern already hinted at by the weekly structure of the Marietta program.

Figure 2. Predicted dose-response under the Controlled Adversity Hypothesis.

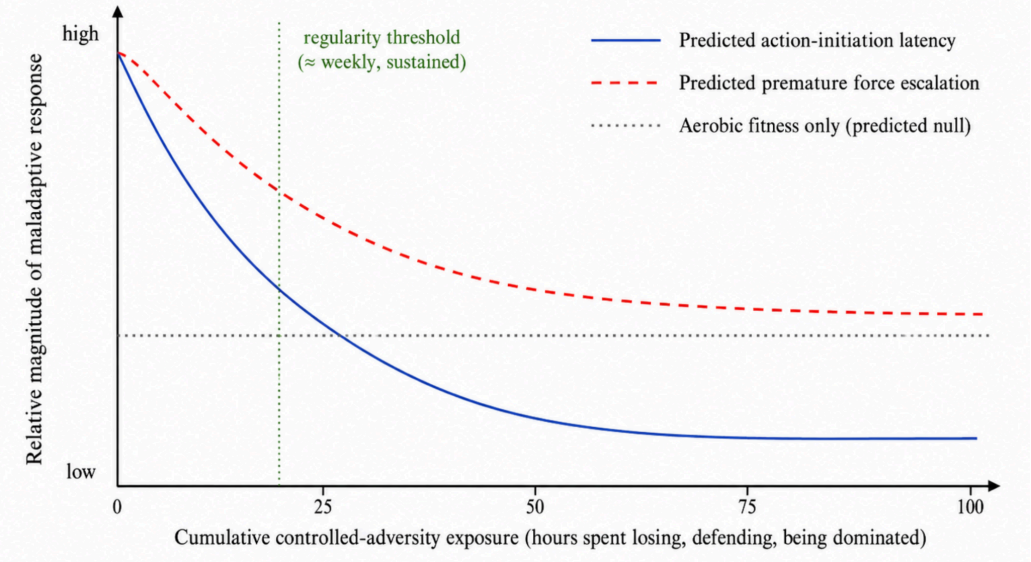

Figure 2. *Predicted dose-response under the Controlled Adversity Hypothesis. The hypothesis holds that action-initiation latency and premature force escalation decline as a function of cumulative controlled exposure to losing, defending, and being dominated, that benefits accrue past a regularity threshold of roughly weekly sustained practice, and that a matched increase in aerobic fitness alone produces no comparable effect (the flat null line). These are hypothesized relationships offered as a falsifiable target, not empirical data.*

The design that would test this is within reach. Recruit participants across grappling, striking, forms-based, and fitness-only groups; quantify each person's cumulative adverse-position exposure; and measure freeze latency and shoot or don't-shoot accuracy under a standardized high-arousal protocol while recording heart-rate variability and salivary cortisol. The hypothesis makes a sharp, disconfirmable prediction: the fitness-only group, matched for conditioning but lacking controlled-losing exposure, should show no comparable benefit, the flat line in Figure 2. If that line is not flat, the hypothesis is wrong in its strong form, and I would want to know it. The practical payoff of getting this right is not academic. It tells a department or a campus what to actually buy: not a fitness

standard, not an aggression seminar, and not a certification day, but a continuous, control-based, adversity-rich program, because that, and specifically the controlled experience of losing, is where the protection is predicted to live.

8. Limits a careful reader should keep in mind

Several cautions bound everything above. The Marietta figures are a single department's self-reported data over roughly 18 months, and officers who chose to train may differ from those who did not, so selection, not jiu-jitsu, could carry part of the effect; the numbers are a strong signal, not a controlled result. The experimental police studies are mostly small, often run in simulators or laboratories, and drawn heavily from Dutch samples, so their generalization to other forces and to civilians is real but not unlimited.

Leach's 10 to 15%, 75%, and 10 to 15% distribution is an estimate synthesized from qualitative testimony rather than a measured population statistic, and should be cited as such. The arousal-performance curve is a useful schematic, not a precise law, and the specific heart-rate performance bands are a widely repeated teaching heuristic whose exact thresholds are contested. Most importantly, the Controlled Adversity Hypothesis is at this point untested; Figure 2 is an illustration of a prediction, not a plot of data, and I have labeled it that way deliberately.

There are ethical and practical limits as well. Sustained combat training carries real injury risk, real cost, and real time demands, and it is not appropriate for every body or every role without adaptation. And the same tool can be misused: if "combat training" is delivered as an aggression-and-domination culture rather than a control-and-composure discipline, the evidence suggests it may increase force rather than reduce it. The prescription that follows from this paper is therefore specific. It is control-based, high-repetition, adversity-rich training paired with de-escalation, not a warrior ethos, and the distinction is the difference between a fix and a hazard.

9. Conclusion: what follows

The safety professions have organized themselves around two comforting errors: that the public will panic, and that the trained responder will stay rational. The behavioral record suggests something closer to the reverse. The public mostly freezes *(stunned, bewildered, sluggish, and impaired - (Leach, J. 2004, 2005),* quietly and compliantly, and the responder's reasoning is the very faculty that acute stress takes offline first. Both problems have, at bottom, the same solution, and it is not more information. It is pre-loaded patterns and a raised arousal ceiling, built the only way they can be built, through realistic, repeated, controlled exposure to the states a crisis produces.

That is why I argue that combat training should be a standard rather than an elective for people whose work is keeping others safe, and why the standard should be measured in sustained weekly repetition rather than certification days. Not to make responders more dangerous, but to make them harder to frighten, because a person who is hard to frighten keeps time, and a person who keeps time keeps options, and options are what separate a resolved incident from a tragic one. The frozen majority in the burning cabin did not lack a plan. They lacked a body that had been there before. We can give responders that body, on purpose, in advance, and I think we are obliged to try.

References

Andersen, J. P., Di Nota, P. M., Beston, B., Boychuk, E. C., Gustafsberg, H., Poplawski, S., & Arpaia, J. (2018). Reducing lethal force errors by modulating police physiology. *Journal of Occupational and Environmental Medicine, 60*(10), 867–874. https://doi.org/10.1097/JOM.0000000000001401

Andersen, J. P., & Gustafsberg, H. (2016). A training method to improve police use of force decision making: A randomized controlled trial. *SAGE Open, 6*(2), 1–13. https://doi.org/10.1177/2158244016638708

Arnsten, A. F. T. (2009). Stress signalling pathways that impair prefrontal cortex structure and function. *Nature Reviews Neuroscience, 10*(6), 410–422. https://doi.org/10.1038/nrn2648

Artwohl, A., & Christensen, L. W. (1997). *Deadly force encounters: What cops need to know to mentally and physically prepare for and survive a gunfight*. Paladin Press.

Bracha, H. S. (2004). Freeze, flight, fight, fright, faint: Adaptationist perspectives on the acute stress response spectrum. *CNS Spectrums, 9*(9), 679–685. https://doi.org/10.1017/S1092852900001954

Cannon, W. B. (1915). *Bodily changes in pain, hunger, fear and rage*. D. Appleton and Company.

Clarke, L. (2002). Panic: Myth or reality? *Contexts, 1*(3), 21–26. https://doi.org/10.1525/ctx.2002.1.3.21

Donner, C. M., & Maskály, J. (2025). Examining the effect of warrior and guardian mindsets on attitudes toward use of force: An analysis of US police recruits. *Policing: A Journal of Policy and Practice, 19*, paaf001. https://doi.org/10.1093/police/paaf001

Driskell, J. E., & Johnston, J. H. (1998). Stress exposure training. In J. A. Cannon-Bowers & E. Salas (Eds.), *Making decisions under stress: Implications for individual and team training* (pp. 191–217). American Psychological Association.

Drury, J., Cocking, C., & Reicher, S. (2009). Everyone for themselves? A comparative study of crowd solidarity among emergency survivors. *British Journal of Social Psychology, 48*(3), 487–506. https://doi.org/10.1348/014466608X357893

Endsley, M. R. (1995). Toward a theory of situation awareness in dynamic systems. *Human Factors, 37*(1), 32–64. https://doi.org/10.1518/001872095779049543

Grossman, D., & Christensen, L. W. (2008). *On combat: The psychology and physiology of deadly conflict in war and in peace* (3rd ed.). Warrior Science Publications.

Kahneman, D. (2011). *Thinking, fast and slow*. Farrar, Straus and Giroux.

Klein, G. (1998). *Sources of power: How people make decisions*. MIT Press.

Kuligowski, E. D. (2009). *The process of human behavior in fires* (NIST Technical Note 1632). National Institute of Standards and Technology. https://www.nist.gov/publications/process-human-behavior-fires

Latané, B., & Darley, J. M. (1970). *The unresponsive bystander: Why doesn't he help?* Appleton-Century-Crofts.

Leach, J. (2004). Why people “freeze” in an emergency: Temporal and cognitive constraints on survival responses. *Aviation, Space, and Environmental Medicine, 75*(6), 539–542.

Leach, J. (2005). Cognitive paralysis in an emergency: The role of the supervisory attentional system. *Aviation, Space, and Environmental Medicine, 76*(2), 134–136.

Marietta Police Department. (2021, February 8). *BJJ training data documents reduction in injuries*. City of Marietta. https://www.mariettaga.gov/CivicAlerts.asp?AID=3116

Mawson, A. R. (2005). Understanding mass panic and other collective responses to threat and disaster. *Psychiatry, 68*(2), 95–113. https://doi.org/10.1521/psyc.2005.68.2.95

Meichenbaum, D. (1985). *Stress inoculation training*. Pergamon Press.

Nieuwenhuys, A., Savelsbergh, G. J. P., & Oudejans, R. R. D. (2012). Shoot or don’t shoot? Why police officers are more inclined to shoot when they are anxious. *Emotion, 12*(4), 827–833. https://doi.org/10.1037/a0025699

Oudejans, R. R. D. (2008). Reality-based practice under pressure improves handgun shooting performance of police officers. *Ergonomics, 51*(3), 261–273. https://doi.org/10.1080/00140130701577435

Quarantelli, E. L. (1954). The nature and conditions of panic. *American Journal of Sociology, 60*(3), 267–275. https://doi.org/10.1086/221536

Renden, P. G., Landman, A., Geerts, S. F., Jansen, S. E. M., Faber, G. S., Savelsbergh, G. J. P., & Oudejans, R. R. D. (2014). Effects of anxiety on the execution of police arrest and self-defense skills. *Anxiety, Stress, & Coping, 27*(1), 100–112. https://doi.org/10.1080/10615806.2013.810213

Renden, P. G., Landman, A., Savelsbergh, G. J. P., & Oudejans, R. R. D. (2015). Police arrest and self-defence skills: Performance under anxiety of officers with and without additional experience in martial arts. *Ergonomics, 58*(9), 1496–1506. https://doi.org/10.1080/00140139.2015.1013578

Renden, P. G., Savelsbergh, G. J. P., & Oudejans, R. R. D. (2017). Effects of reflex-based self-defence training on police performance in simulated high-pressure arrest situations. *Ergonomics, 60*(5), 669–679. https://doi.org/10.1080/00140139.2016.1205222

Roelofs, K. (2017). Freeze for action: Neurobiological mechanisms in animal and human freezing. *Philosophical Transactions of the Royal Society B: Biological Sciences, 372*(1718), Article 20160206. https://doi.org/10.1098/rstb.2016.0206

Selye, H. (1956). *The stress of life*. McGraw-Hill.

Yerkes, R. M., & Dodson, J. D. (1908). The relation of strength of stimulus to rapidity of habit-formation. *Journal of Comparative Neurology and Psychology, 18*(5), 459–482. https://doi.org/10.1002/cne.920180503