This is your brain.  This is your brain on VirTra.

Michelle Kwan, 2002 Olympics, fell on the triple jump.

Greg Norman, 1996 Masters, lost his lead and handed the Masters to Nick Faldo.

Dan O'Brien, 1992 Olympic trials, shockingly missed—entirely missed—three pole vault attempts.

Atlanta Falcons, certain to win Super Bowl LI, handed a victory to the Patriots.

Red Sox, 1986 World Series, ahead of the Mets 3-2 in the series, give up games 6 and 7.

These are prime examples of choking, a disastrous brain cramp or physical freeze at a critical moment of performance.  Even if one factors in the mythic Curse of the Bambino in the 1986 Red Sox choke, this is a list of teams and players who were favorites to win and they went down in flames at the crucial moment.  Have you ever choked? Did a coach ever shout, "you're thinking to much, just make the shot!"

Choking under pressure in the World Series or the Masters or the Olympics is embarrassing and maybe even financially painful to an athlete or a team.  For a cop, choking under pressure in a deadly force encounter may be deadly.

University of Chicago psychologist Dr. Sian Beilock studies the cognitive science of choking. She explains that choking may result from over-thinking a situation.  A spike in anxiety may

result from over-analyzing every detail of the anticipated performance. This has been called "paralysis of analysis." When the pressure to perform spikes, the brain's processing ability to store the steps of a motor program necessary to execute the immediate task may be overloaded.

Though we don't talk about it much in the law enforcement training world, most veteran officers and trainers can point to examples of officers who choked under pressure. As we continue to develop curriculum to use the VirTra® virtual reality system to its full capacity, we've studied the science of choking. Several members of our VirTra training cadre are certified Force Science® Analysts, and one of our staff is currently working toward the post-graduate certification as an Advanced Force Science Analyst. We recently discussed Force Science principles and how we might better help officers prevent choking in a critical incident.

Dr. Beilock advises practicing under stress to prevent choking. According to Dr. Beilock, addressing a threatening circumstance while under stress, even moderate stress, lowers the overload when actually in a a tense, uncertain and rapidly-evolving critical incident. Our training staff works with local agency trainers to develop a learning plan and VirTra virtual reality experiences that inoculate against choking in a public safety critical incident.

At the same time we're helping officers avoid choking, the VirTra virtual reality experiences that we provide also increase the likelihood of accurate shooting during a critical incident. Research from the Faculty of Human Movement Sciences at the University of Amsterdam demonstrates that officers who engage in virtual live firing in a high-stress learning scenario are more likely to develop and retain positive short- and long-term effects on the officers' shot accuracy under pressure.[i]

As officers perform in a high-stress virtual reality scenario, unfolding at the speed of life on the street, officers also develop automaticity in their critical decision-making skills. They improve skills at recognizing patterns of behavior and more quickly and accurately selecting an appropriate response. The learning pattern is known as a "recognition-primed decision" model.

Dr. Gary Klein, a former U.S. Air force research psychologist and pioneer in the study of naturalistic decision making, has long studied command and control performance and decision-making. Klein concludes that most officers faced with a dynamic and complex situation use the recognition-primed decision ("RPD") model.[ii] Obviously, officers with a wider array of experience, particularly critical incident and high stress training experience, will have a broader system of patterns to guide an RPD response.

In the almost imperceptibly brief microseconds given to decision-making in a critical incident, an officer automatically processes perceived threats and possible responses. The brain shifts to RPD when faced with an urgent situation with little or no time for rational decision making and when lacking detailed data for linear processing. An officer's survival, and potentially the officer's civil and criminal exposure, hangs in the balance in the instant that RPD shapes the officer's response to a threat.

Recognition-primed decision making involves rapid scanning of plausible options and selecting the first pattern match option. An officer observes cues and indicators that generate recognition of a pattern. The officer considers alternative action scripts (mentally sorted according to typicality) in a scan through the officer's neurological database of similar experiences, compares a particular action script to the situation presented in a mental simulation, and accepts and executes the first non-rejected action script. One veteran emergency services trainer describes RPD as "if it sounds like a duck, it's most likely a duck."

Recognition-primed decision making experts claim that as an officer becomes more experienced (whether by field experience or reality-based scenario training), the officer builds ability to choose the best action script. The hero of the "miracle on the Hudson," Captain Chesley "Sully" Sullenberger III said: "For 42 years, I've been making small, regular deposits in this bank of experience, education and training. And on January 15, 2009, the balance was sufficient so that I could make a very large withdrawal." Officers who train hard in the virtual reality environment are preventing choking, developing shooting accuracy under pressure, honing RPD ability, all while making vital deposits in their individual bank of experience, education and training.

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[i] Nieuwenhuys & Oudejans, *Training with anxiety: short- and long-term effects on police officers' shooting behavior under pressure*, Cognitive Processing, (2011) 12:277–288.

[ii] Klein, *Sources of Power-How People Make Decisions*, (1998), cited in Klein & Wallentine, *A Rational Foundation for Use of Force Policy, Training and Assessment* (2014).