



Force Science® News #72

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Researchers Move Closer to Explaining High Performance; New FSRC Study Hopes to Identify “Best” Training

In this issue:

I. RESEARCHERS MOVE CLOSER TO EXPLAINING HIGH PERFORMANCE;
NEW FSRC STUDY HOPES TO IDENTIFY “BEST” TRAINING

II. STARTING SOON: ARTWOHL SERIES ON BEHAVIORAL SCIENCE ISSUES
IN LAW ENFORCEMENT

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**I. RESEARCHERS MOVE CLOSER TO EXPLAINING HIGH PERFORMANCE;
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Researchers have now identified a specific brain chemical that appears to influence how well you’ll perform under stress and how emotionally resilient you’ll be after a critical incident. The more you have of this powerful ingredient, called neuropeptide Y (NPY), the better off you’ll likely be when your life is on the line.

“Maybe somewhere down the road every officer before every shift will be injected with NPY, as well as other neurochemicals that facilitate performance,” says Dr. Bill Lewinski, executive director of the Force Science Research Center at Minnesota State University-Mankato. “But I don’t see that in the near future.”

More immediately, in his opinion, scientists will work to unravel the “nature vs. nurture” question-is the level of this valuable chemical that is released in the brain during stress

rigidly predetermined for each individual or can it be altered by experience or behavioral methods?

Meanwhile, FSRC is seeking funding for a major study to determine, in effect, which training techniques will most reliably produce NPY-like benefits for officers, including better focus and skill utilization during a crisis, less trauma afterward, and sharper memory of what actually took place.

One recent NPY research project, conducted by Dr. Charles Morgan, associate professor of psychiatry at Yale University, sought a better understanding of “how we regulate fear and anxiety in our bodies,” according to a report in Yale Scientific Magazine.

Morgan and colleagues tested NPY levels and cognitive functioning in soldiers before, during, and after exposure to the stress of survival training at Ft. Bragg, NC. They discovered a “positive correlation between elevated levels of neuropeptide Y and lucidity of mind.”

Specifically, special-forces soldiers, who averaged 33% higher plasma levels of NPY than general troops, “were found to possess clearer minds and to have out-performed other soldiers under stress. Likewise, soldiers in combat-dive training who released higher levels of NPY during stress “excelled in underwater navigation,” and hostage rescue team members with higher NPY levels also performed better under stress.

Another research team, headed by Dr. Rachel Yehuda of the Traumatic Stress Studies Program at Mount Sinai School of Medicine in NY, compared military combat veterans who developed PTSD to those who did not.

These researchers found a “significant” correlation between higher NYP levels, “a protective stress factor,” and “positive coping”; that is, “a biologic...resilience to or recovery from the adverse effects of stress.” In other words, Lewinski explains, “Neuropeptides are linked to healthy emotional recovery. The higher your level, the healthier recovery you have.

Elaborating on Morgan’s and Yehuda’s findings, Lewinski told Force Science News: “NPY fuels the attention center of the brain. It facilitates the brain’s ability to pay attention to the environment around us, to screen information, and to select what to focus on and what to do to bring about a desirable outcome. Attention is the key to good performance. If you can’t identify and focus on what’s important to attend to, you can’t apply the skills you need to win an encounter.

“Likewise, attention impacts on memory, so your recall is influenced by this area of the brain too.

“NPYs apparent effect on trauma is also related to attention and focus. A big factor in an officer experiencing trauma after a critical incident is the sense of having been out of control and not able to influence the event or its outcome.

“An officer who can focus his attention on a positive effort to stop the threat—like placing his front sight to deliver effective rounds into a suspect—is likely to survive much better physically and emotionally than an officer who shoots wildly in panic and fear. Even if the encounter doesn’t turn out ideally, you’re left with a greater psychological sense of control.”

Much remains to be learned about NPY and its influence on performance and stress recovery. One area warranting further study concerns the impact of alcohol. According to Lewinski, animal tests suggest that alcohol consumption significantly impairs the production of NPY. “If this holds true for humans, this may present a difficult new issue for trainers and officers.”

Yale Scientific reports that “Morgan and colleagues are now seeking investigational drug approval for an IV administration test, designed to boost levels of NPY” and explore the effects. “Future drugs may aim to raise NPY levels.”

“The full extent to which we can influence brain chemistry independent of drugs is yet to be determined,” Lewinski notes. “But we do know that the brain is malleable and can change with our efforts to use it and make it grow. The challenge is to find the best way or ways through training to alter the brain’s attention center so that each officer has a shot at enjoying the kinds of performance and coping benefits that seem to be related to high levels of NPY.”

In the study FSRC hopes soon to fund, Lewinski and his research team will test which training approaches seem best for helping officers develop mental control and constructive focus in high-stress encounters.

“It’s essential to officer survival that we identify how to most effectively facilitate and enhance attention and focus because this will improve performance in many types of stressful situations,” Lewinski says.

“Initially, we’ll be testing a variety of attention-developing mechanisms to see which produce the most desirable results. Ultimately we hope to have the scientific basis for showing trainers how to build an officer’s ability to determine what’s most important to pay attention to in complex, life-threatening encounters and thus build his or her ability to respond appropriately.”

Among the popular training components FSRC researchers plan to examine are so-called “stress inoculation” exercises. “Many trainers believe this is helpful because it exposes officers to the ‘realism’ of the street,” Lewinski observes. “But if this involves just

heaping stress on trainees, it may not be as helpful as imagined. In fact, it can be counterproductive by instilling fear and anxiety.

“The idea is not to traumatize officers with stress but to skillfully guide them to develop the ability to focus on what’s important to their survival during a stressful encounter. This, then, becomes a training method that enhances confidence and competence, so the officer emerges better prepared to defend his life and defeat a threatening adversary.

A grant proposal for this research is currently before the National Police Federation in England.

An earlier report by FSN told of work by Dr. Morgan concerning the effect of high stress on memory. For details of his surprising findings from that research, see FSN Transmission #2.

Speaking of focus, multi-tasking—trying to do more than one thing at a time—sounds efficient and time-saving, but it actually slows you down, according to several new research reports cited in a recent article from the New York Times News Service.

Researchers from Vanderbilt University, for example, found that when study participants attempted 2 tasks at the same time, responses were delayed by up to a second. In many daily tasks, a lost second is unimportant, but in some situations that fragment of time could be critical.

Neuroscientist Rene Marois mentions talking on a cell phone while driving a car, a subject we’ve addressed in previous FSN transmissions (for example, see Transmission #24, 8/1/05.

“A one-second delay in response time at 60 miles an hour could be fatal,” he points out.

“We are under the impression that we have this brain that can do more than it often can.”

II. STARTING SOON: ARTWOHL SERIES ON BEHAVIORAL SCIENCE ISSUES IN LAW ENFORCEMENT

Want to know more about how your memory works under stress...how to make the best decisions when your life is on the line...how an officer-involved shooting investigation should be conducted, and other topics that affect your survival on the street and beyond?

Check out a new series of insightful articles focused on these and other behavioral science issues related to law enforcement that will be launched in the next issue of The Tactical Edge, the quarterly publication of the National Tactical Officers Assn., due out this summer.

The series will be authored by Dr. Alexis Artwohl, the internationally known police behavioral scientist and a member of the National Advisory Board for the Force Science Research Center. Artwohl will also again be a trainer at the NTOA's annual Tactical Conference, scheduled for Sept. 16-21 in Milwaukee.

You can receive The Tactical Edge as a benefit of membership in NTOA. To apply and for more information, go to www.ntoa.org

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Written by Force Science Institute
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