

THIS ISSUE

Hydration... How much is too much? There have been a few stories in the news where people have died from drinking too much water... here's a little more information about it.

Why practice can't make perfect... A report on a recent study from Stanford University.

Effect of Practice on Brain Activity: An investigation in Top-Level Rifle Shooters...
A synopsis of an article originally published in Medicine & Science in Sports & Exercise, the official journal of the American College of Sports Medicine.

Mental Training Bibliography...
A list of the CoachNet favorites.

The Wind Book for Rifle Shooters...

...by Linda K Miller and Keith A Cunningham is now available from www.paladin-press.com

You can find other retailers by searching www.amazon.com

For your convenience, you can also order the book from MilCun... email us from www.milcun.com

FINAL ISSUE

After Ten Years...

After ten years of publishing CoachNet, I have, with regret, decided to stop. Well, it isn't so much that I decided... my loyal readers will have noticed that I haven't been able to get an issue out to you for some time. And I finally acknowledged to myself that I just don't have time to do this any more. Ironically, it is our coaching business that has taken over all my spare time.

Thanks to all of you for your support over the past ten years... without your continuing encouragement, CoachNet would never have existed.

As my parting gift to you, I ask you to freely copy back issues and send them to your fellow coaches and young shooters. If any of the approximately 120,000 words that have been written over these years are of help... it will have been worth it.

See you on the range,

Linda (Editor)

Anyone involved in Service Rifle shooting may find the following blog interesting:
cfcst2008bisley.blogspot.com

HYDRATION

The following article was sent to us by one of our readers.

Fluid Intake by Athletes

Not only is there controversy about how much fluid the average person needs, researchers debate how much fluid athletes require. A recent editorial points out that advice to consume too much fluid has caused hundreds of cases of water intoxication and at least seven reported deaths.

The technical name for this condition is hyponatremic encephalopathy. Sodium in the blood is reduced to the point where the brain swells. Marathon runners and military personnel, in particular, have been told to drink too much water based on erroneous assumptions that all weight lost during prolonged exercise is due to fluid loss, that sensations of thirst underestimate fluid needs, that a universal formula for fluid needs exists, and that high fluid intake can do no harm. The editorial was published in the July 19, 2003 edition of the British Medical Journal.

<http://bmj.com/cgi/content/full/327/7407/113>

HERE'S WHAT YOU NEED TO KNOW: Yet another case in

which expert advice was not based on solid evidence. The author of the editorial is one of the most respected researchers in this area and recommends drinking according to personal dictates of thirst.

CoachNet Comments

We hope that the folks to whom you sent the article stopped to read through to the end and went to the British Medical Journal link. Here they would find that the good doctor suggests that the usual (and safe) intake of water "ranges between 400 ml and 800 ml per hour in most forms of recreational and competitive exercise" ... by my math, in a typical competition day, the target rifle (typical fullbore rifle long range matches) shooter would spend about 8 hours on the range and this would translate to a fluid intake of 3200 to 8400 ml per day... far far more than your average shooter consumes.

Coming in 2009...

The Power of
Mental Marksmanship
by Linda K Miller and
Keith A Cunningham.
All the secrets revealed!
Will be published by
www.paladin-press.com

WHY PRACTICE CAN'T MAKE PERFECT

One of our CoachNet subscribers (Brian King of Eldorado, Ontario) sent us a very interesting article published in the Toronto Star ("Why practice can't make perfect" by Joseph Hall, December 21, 2006).

In the article, Hall reports on a recent study from Stanford University that apparently shows our brains were meant to handle variable, not repetitive, tasks.

Since excellence in shooting sports relies on the marksman's ability to repeat the same shot procedure in painstaking detail, this is sad news indeed! It is similarly sad news for pianists, golfers, basketball players (free-throwers) and many other musicians and sportsmen/women who spend hours developing the ability to repeat the same performance on demand.

Mr. Hall asks, "Ever wonder why your tee shot still slices after smacking 30 buckets of balls on the driving range? Or why an NBA superstar can still miss a free throw after practicing the shot thousands of times?"

The Stanford University study indicates that a quirk of the human brain ensures that practice can never make perfect.

Apparently, when the human brain is presented with a task, it is programmed to consider it anew. Even though you may have performed the same task thousands of times, the brain thinks about what it needs to do to respond each and every time. "Human brains," the article says, "have evolved to consider anew even the most practiced of motions before launching into it... and that planning process, often momentary and subconscious, can change the outcome of every move you make." The researchers conclude that we are "doomed" to make mistakes, right from the first thought.

Every shooter knows how important it is to repeat the firing sequence exactly the same way every time and every shooter knows just how easy it is to have small variations in the process. Sometimes the body is not completely relaxed in the same way, sometimes the breath is not held in quite the same place in the breathing cycle, sometimes the sight picture looks just a little different, sometimes the trigger finger is not exactly in the same place, sometimes the shot is a little less or a little more subconscious, sometimes the follow-through is smooth and sometimes it is not so smooth.

Scientists have long believed that the fault for such variations lay in the muscles. "The

fundamental tenet of the field is that you can't activate your muscles the same way every time." Applied to shooting, we teach our shooters to shoot from a relaxed position because we believe that the muscles cannot be activated (tensed) the same way every time, particularly over a long course of fire (where the muscles are changing as they respond to recoil and eventually tire).

While the Stanford study does not specifically challenge this belief, they do challenge a second one that is very relevant to shooting. They challenged the belief that the brain can repeat the same sequence when it is directing a repetitive action.

Mr. Hall reports that the Stanford study places at least half the blame on the brain, arguing that its obsessive planning function provides a fertile source for errors. The scientists contend that a significant portion of movement errors originate in the brain.

"You are doomed to have variability in your movement," says Krishna Shenoy (the Stanford scientist involved in conducting the study). "And it's not just because your muscles can't work perfectly, but also because your brain is incapable, it appears, of planning the same movement each and every time."

Now, before you decide you don't need to practice at all, here are a couple of things to think about:

- Tiger Woods hasn't stopped practicing, and probably your competition has not either.
- Afsheen Afshar, the co-author of the study says that it is clear that practice does improve performance, even if it can't lead to perfection. This reminds us of the old saying that if you and I are being chased by a bear in the woods, I don't have to outrun the bear, I only have to outrun you.

There is another view of what we are actually practicing when we practice target shooting. It may not be that we are trying to do the same thing every time, but that we are trying to produce the same outcome by having the correct response to changing circumstances. We already know and acknowledge that we do not shoot and cannot shoot the same shot over and over. We understand that the circumstances are different for every shot. Our muscles and our minds are either learning or tiring all of the time, and for most shooting sports, light and wind are changing from shot to shot. In addition, we have the awareness of what we have accomplished so far in the practice, and have perhaps purposefully modified our

approach to improve our performance. So, rather than practicing to produce the same mechanics, we are really practicing to produce the right response to changing circumstances.

This is the type of thinking that is demonstrated by those who practice and compete thinking of the "one shot match". And this is the type of thinking that plays to the natural strengths of the brain, as far as the Stanford researchers describe it.

The researchers speculate that this "improvisational style" of the brain evolved because the vast majority of situations requiring significant movement that we faced (during humans evolution) were novel. For example, predators would not catch and kill prey in exactly the same way each time. "There weren't many natural situations where the brain would have to do the same thing over and over again," Afshar said.

The researchers test subjects (Rhesus monkeys) were monitored during thousands of repetitions of trained movement activities (such as reaching for a button). The brain activity in the "planning center" of the brain indicated small variations in the brain activity for each repetition and that small variations in the physical movement could be

predicted by monitoring this pre-motor brain activity.

However, while this study provides interesting insight into the activities of the brain, it is immediately begs the question that most shooters have: does training in some way suppress, override, or minimize this natural brain activity? The study is only the first step to answering the question whether practice makes perfect. The shooter knows (as does the golfer and pianist) that the best performances result when the training has been sufficient to allow the subconscious to take over the critical movements. The conscious mind still sets the goals and monitors the external world, but the best shots are fired when the subconscious is allowed to respond to the visual stimulus (sight picture) with no interference from any other part of the brain.

In researching this article, CoachNet looked up "Neuron" magazine where the research article was originally published www.neuron.org. Another article in their April 2007 issue was on pattern recognition (which I believe is a central part of the subconscious trigger release) and that article seemed to suggest that another brain mechanism altogether was responsible for pattern recognition and that repetition shortened the pause

between recognition and reaction. This would certainly apply to shooting, and in a broad sense could indicate that the more the shooter practices, the quicker the response between seeing the correct sight picture and releasing the subconscious shot.

Personally, I am going to keep practicing.

Are you interested in operational style shooting (pistol, tactical rifle, sniper/precision rifle)?

You may find this website helpful:

www.osacanada.ca

Art is passion
pursued with discipline;
science is discipline
pursued with passion.
...Arthur Sackler

Shooting is both an art and a
science.
...All shooters, everywhere

"You can't build a reputation on
what you're going to do ...
Do it now!"
Anonymous

EFFECT OF PRACTICE ON BRAIN ACTIVITY: AN INVESTIGATION IN TOP- LEVEL RIFLE SHOOTERS...

A synopsis of an article originally published in Medicine & Science in Sports & Exercise (Volume 37(9), September 2005, pp1586-1593), the official journal of the American College of Sports Medicine. A copy of this article was kindly sent to me by fellow shooter Dr. Roger Mullin.

The purpose of the study was to investigate the effect of training (motor experience) on the brain activity associated with trigger release (self-paced movement of the left and right index fingers).

The subjects in the study included high level rifle shooters as well as people with no shooting experience (the latter being the control group to show "normal" or "average" brain function). All subjects were right-handed.

The study monitored activity in the movement-related parts of the brain and measured four components, including two that relate specifically to the planning of movement (which is what was measured in the Stanford study described above).

The authors note that performance of motor tasks (skiing, dancing, piano playing) improves with practice. They

indicate that there are two main areas of study for this phenomenon:

- One area of study looks at structural changes in the brain following movement training; and
- The other looks at the activity of the brain prior to and during the movement.

This study involves the latter and used MRI and other (more precise) monitoring techniques during the movement activities.

The study found that there are differences in brain activity between the inexperienced and the expert shooters. A key difference was that expert shooters had less brain activity during the planning portion of the movement (pre-motor preparation) and less brain activity during the task execution. In addition, the dominant side of the brain tended to be given great control during the task for tasks that had been highly practiced. Altogether, the researchers say that this indicates that the well-trained shooter needs fewer brain resources than the inexperienced shooter. (While that finding may be intuitively obvious, it is nice to have science back it up - we all know how much harder we have to work mentally when we are learning a new task.) More importantly, the study found that practice suppresses

the cognitive processes that are irrelevant for the motor task. The researchers say that with practice "automization" increases and less cognitive effort is devoted to the motor task.

Details

Later in the study, the authors more closely define the expert shooters that they used; apparently, they were "professional" top-class clay target shooters, who had participated in such competitions as the 2000 and 2004 Olympics. (Both the expert group and the inexperience group included females, about 20%.) Clay target shooting naturally provides a variety of shooting conditions for the subjects to respond to. The study described clay-target shooting as an endeavor that requires a high level of visu-motor coordination, attention and resilience to fatigue. They found that these athletes were better at all elementary visu-motor functions than the control group; particularly, their saccadic reaction time is faster.

The test itself was not live shooting but a simulation of trigger pressing only. This was self-paced at a specified rhythm, but it was not in response to a visual stimulus.

MENTAL TRAINING BIBLIOGRAPHY

This is the list of the mental training books that MilCun Marksmanship Complex hands out to both our police sniper students and our competition shooters.

Bassham, Lanny

- With Winning In Mind

Benson, Herbert

- The Relaxation Response

Bompa, Tudor

- Theory and Methodology of Training

Byrne, Rhonda

- The Secret

Carron, Albert V.

- Motivation (Implications for Coaching & Teaching)

Dalloway, Marie

- Visualization: The Master Skill in Mental Training
- Concentration: Focus Your Mind, Power Your Game
- Drive and Determination: Developing Your Inner Motivation
- Risk Taking: Performing Your Best During Critical Times
- Reflections on the Mental Side of Sports

De Bono, Edward

- Lateral Thinking
- Six Thinking Hats

Domey, Richard L.

- Mental Training for Shooting Success

Ebon, Martin (Editor)

- TM: How to Find Peace of Mind Through Meditation

Fuoss, Donal and Troppmann, Robert

- Effective Coaching (a Psychological Approach)

Gallwey, Timothy W.

- Inner Tennis (Playing the Game)
- The Inner Game of Tennis

Garfield, Charles

- Peak Performance

Harris, Dorothy V and Harris, Bette L.

- The Athlete's Guide to Sports Psychology: Mental Skills for Physical People

Helmstetter, Shad

- The Self-Talk Solution

Herrigel, Eugen

- Zen In The Art of Archery

Klavora, Peter and Daniel, Juri V.

- Coach, Athlete, and the Sport Psychologist

Le Shan, Lawrence

- How to Meditate

Loehr, Dr. James E. and McLaughlin, Peter J.

- Mentally Tough

Maltz, Dr. Maxwell

- Psycho-Cybernetics

Miller, Linda and Cunningham, Keith

- Favorite Stories on Attitude
- Favorite Stories on Winning
- Favorite Stories for the Competition Coach
- Favorite Stories from a Professional Perspective
- The Dream Team
- The Power of Mental Marksmanship (to be published in 2009 by Paladin Press)
- The Wind Book for Rifle Shooters

Millman, Dan

- The Inner Athlete

Nideffer, Robert M.

- The Inner Athlete

Orlick, Terry

- In Pursuit of Excellence

Orlick, Terry and Partington, John

- Psyched

Ostrander, Sheila and Schroeder, Lynn

- Super-Learning

Peale, Norman Vincent

- You Can if You Think You Can

Rushall, Brent S.

- Psyching in Sport

Robbins, Anthony

- Unlimited Power

Schubert, Dr. Frank

- Psychology from Start to Finish

Selye, Hans

- Stress Without Distress

Tutko, Tom and Tosi, Umberto

- Sports Psyching

Waitley, Denis

- The Psychology of Winning
- Seeds of Greatness

What is popular
is not always right.
And what is right
is not always popular.

Leaders are like eagles,
they don't flock...
you find them one at a time.

Happiness is not something you
experience. It's something you
remember.

Linda's last word...

If I may leave you with just one
thought, it is this:

You attract what you expect.

May you expect the best,
and let it find you.
