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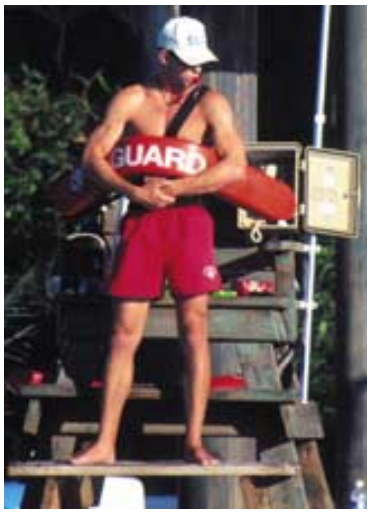
The Vigilant Lifeguard

A comprehensive report examines the hypothesis that the "level of arousal" affects an individual's performance.

By Tom Griffiths, Ed.D.
Special to Aquatics International

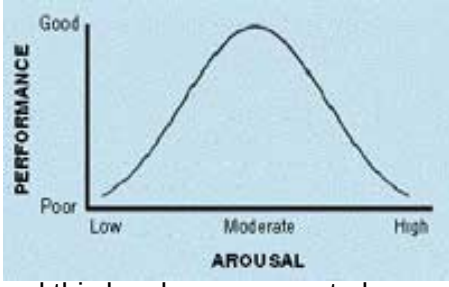
When I began my aquatics career way back in the 1970s at the University of Maryland, I was intrigued by the Inverted U Hypothesis of sports psychology.



In fact, I spent the first decade of my career showing how the Inverted U explains panic in novice scuba divers. When we stressed scuba divers with too many underwater tasks, the performance on a timed U.S. Navy pipe puzzle test dropped significantly.

The findings supported a basic tenet of the Inverted U: As stress and arousal increase, performance decreases. Generally, the Inverted U Hypothesis deals with levels of arousal, specifically psychological arousal, anxiety or excitement.

Since the early 1900s, we have known there is an optimal level of psychological arousal for different physical and mental tasks.



In 1908, the Yerkes-Dodson Law graphically showed that very high and very low levels of arousal could be used to predict poor performances. Simply stated, moderate levels of arousal produce the best performances in most cases, and this has been proven to be the case in competitive sports as well. Excessively high levels of arousal produce catastrophic performances, panic and “choking,” whereas very low levels of arousal lead to lackadaisical,

MORE INFORMATION

- Research findings
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unmotivated performances.

For optimal performances in many motor skills and vigilance tasks, there is a happy medium level of arousal.

Since the inception of the Yerkes-Dodson Law, thousands of articles and books have been written on controlling excessive arousal and anxiety for optimal or peak performance.

Staying focused and relaxed in a stressful environment is an important component of success. Whether we're talking about competitive swimming, diving, football, basketball or golf, a little bit of nervousness is helpful, but too much can quickly lead to choking. In the water-safety venue, we have known for years that for lifeguards, a moderate number of swimmers and/or activities produce the best vigilance. But both very slow days and very busy days can lead to poor lifeguarding performance and less vigilance.

Lifeguards as athletes

While sports psychologists and psychophysiologists have dealt primarily with overarousal and high anxiety in athletes, many lifeguards and their supervisors grapple with low levels of arousal — that is, long periods of uneventful surveillance without any hint of "potential drowners."

Certainly, low levels of arousal are not the norm for most ocean guards or lifeguards at busy waterparks with many and varied stimuli — except on the occasional slow day. But for the thousands of guards scanning the "boring" rectangular pools in this country (schools, parks, neighborhoods, hotels and community centers), this is a huge problem.

The key to effective lifeguarding is constant vigilance, but vigilance is difficult to maintain in an uneventful setting. Monotony leads to boredom, which, in turn, leads to a lack of vigilance, one of the biggest problems in lifeguarding today.

Jeff Ellis & Associates, a lifeguard training organization and aquatic safety consulting firm in Kingwood, Texas, performed approximately 500 tests in 90 pools last summer. Even though Ellis lifeguards are comprehensively trained in the "10/20 Patron Protection Rule" — 10 seconds to detect someone in distress and an additional 20 seconds because it is possible for someone to drown in as little as 30 seconds — the average response time to a lifelike manikin placed on the bottom of the facility was 1 minute 14 seconds. (It must be mentioned that the 10/20 rule has been emphasized for victim recognition and response at, or near, the surface.)

In this case study, the manikin was placed directly on the bottom of the pool. Although Ellis guards have a reputation for being vigilant and for strictly adhering to the 10/20 rule, the lifeguards in this study who appeared to be scanning (an ongoing surveillance process by lifeguards to monitor people in their coverage area)

were apparently concentrating on the surface.

The results of this Ellis study detected a problem in their scanning process that they are now attempting to remedy. The problem of vigilance is not exclusively a lifeguarding phenomenon, but also afflicts pilots, automobile drivers and other surveillance personnel.

Flying and driving

Much has been written and researched on high states of arousal, but very little has been conducted on low levels of arousal and boredom — and even less has been written about lifeguard vigilance.

At low levels of arousal during any surveillance task, it is almost impossible to maintain attention, concentration and vigilance for extended periods of time. Most of what we know about lifeguard vigilance must be inferred from research results compiled in other fields of study.

During WWII, studies on vigilance and sustained attention began out of necessity. The Royal Air Force commissioned psychologist Norman Mackworth to study a dangerous phenomenon: Airborne radar operators were missing important blips on their screens after short periods while performing this simple surveillance task.

It was thought that if radar operators could so easily miss German submarines on their screens, control tower personnel, airport security (and lifeguards, in our case) might be experiencing the same problems while on duty. Numerous studies confirmed that half of the reduced vigilance was occurring during the first 30 minutes on watch, but sometimes it began as early as 15 minutes into surveillance.

Another aspect of these studies deals with the complexity or difficulty of the task being performed. For optimal performance, a higher level of arousal or activation is needed for simple tasks, and a lower level of arousal is needed for more difficult tasks.

Scientists then learned that some physiological strategies could be used to increase vigilance. Mild physical exercise, sensory stimulation and even changes in environmental temperatures may increase the attentiveness of individuals performing simple surveillance tasks.

A study in Paris in 1992, using nuclear station control room operators, found improvements in vigilance when operators worked in teams of two and alternated between active and passive surveillance, with frequent changes in activities. In his 1970 book Vigilance and Attention, Mackworth found that frequent short breaks and even changes in activities may lead to increased vigilance.

Other studies found the more noncritical signals that observers must examine over a long period of time, the less likely they are to

detect the critical signs. Vigilance actually increased with the frequency of critical signals detected, and as noncritical signs decreased. This is of vital importance to lifeguards, particularly those working at traditional, simple swimming pools.

Heat is an enemy

Temperature also can have a negative effect on vigilance. Mackworth found that when temperatures rose above 84 degrees Fahrenheit, a noticeable decline in performance occurs.

This is double trouble for lifeguards because as the temperature climbs higher, attendance at pools usually increases. Therefore, dipping into the water while rotating to a new position or using a water-misting bottle when stationary may help to keep lifeguards cool and more attentive. Shade and the consumption of cold water also may help lifeguards remain alert when the weather is warm.

Although studies involving automobile drivers may not be as sophisticated as those cited here, the results are similar to the pilot studies. According to the AAA Foundation for Traffic Study, results published on its Web site indicate a disproportionate number of automobile fatalities are caused by falling asleep under the monotonous driving conditions on straight, smooth and nonwinding roads.

Fewer accidents caused by sleep or drowsiness occur on windy, curvy, “dangerous” roads. Why? Those long, straight, boring roads do not provide enough variety, stimuli or arousal. Sounds a bit like lifeguarding, doesn’t it?

It is logical, then, to theorize that ocean and waterpark guards tend to be more vigilant than traditional pool guards. Even pool guards claim to be more vigilant when they are busy.

The AAA also found from surveying thousands of drivers that the most effective ways to overcome driving boredom are to rotate drivers, talk with someone in the vehicle, sing, pull off the road to exercise and wash the face with cold water. It should be emphasized that no behavioral countermeasures in these studies were as effective as sleep, either before a road trip or at a rest stop during a trip.

Part 2 next month will take a closer look at scanning, and also ways in which lifeguards can maintain vigilance even in the most uneventful of situations.

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