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Using Eastern Philosophy to Optimize Sports Performance, in "Western" Terms

Ronda Wimmer, PhD, MS, LAc, ATC, CSCS, CSMS, SPS

The use of biorhythms or circadian rhythms is categorized as chronobiology within the Western scientific community. Chronobiology is defined as "the study of rhythm patterns in biological phenomena."[1]

In Eastern philosophy, yin and yang aspects of the circadian clock represent an extremely important external synchronizer. This is based upon the transitional yin and yang rhythms of yin (nighttime/the sun going down) passing into yang (daytime/the sun coming up). These transitional rhythms are broken down into four quadrants within a 24-hour period. This clock gets even more specific, and also represents the times at which *qi* and blood are at their peak within each respective *zang/fu* organ. Each organ has a two-hour window that represents one organ entering the next, in a clockwise order of progression.

Chronobiology identifies the nature of these biorhythm patterns within the German model, *zeitgeber,* meaning time-givers, and biorhythms are considered external environmental cues. These external cues affect the athlete's ability to adjust to seasons, time zone changes and daylight.

According to Eastern philosophy, *qi* and blood represent the energetic or bioelectric and/or biomagnetic influence upon the body - an underlying influence upon all bodily functions that is difficult to tangibly quantify within the Western scientific community. The fact that it does exist makes it a possibility for improved performance. Thus, these biorhythms; circadian rhythms; energies; and bioelectric and/or biomagnetic fields also have significant influence upon psychomotor; physiological; cognitive; and psycho-emotional functions within sports performance.

By truly understanding Eastern philosophy patterns of *qi,* blood and body fluids, one can identify specific predisposing/pre-existing factors that may inhibit an athlete's optimal performance. Integrating traditional Chinese medicine (TCM) individually, we can identify and prevent the athlete's anticipated potential to develop dysfunctions that inhibit optimal athletic performance. Therefore, highly specialized education in multiple arenas, including sports medicine; exercise physiology; sports performance; and Oriental medicine need to be fully understood to effectively use this method for optimal training of athletes.

The integration of the Oriental medicine perspective can significantly influence sports performance and assist in injury prevention by understanding how it can be incorporated into an athlete's training regimen, cycle and/or environmental pattern, and is an important variable to be considered within a sports performance consultation.

Scientific Basis

The scientific community looks at biorhythms as geophysical phenomena associated with the 24-hour rhythmic rotation of the earth on its axis and the transition from dawn to dusk.[2] Scientists

explain that the human biological clock is located within the hypothalamus, specifically in the suprachiasmatic nucleus (SCN). This accepted theory explains that light stimuli activate the SCN through the process of phototransduction (the transformation by photo receptors) of light changed into an electrical potential. The brain orchestrates communication among numerous nerve fiber pathways. Once the electrical impulse is communicated from the SCN to these nerve fibers, the influence upon athletic performance varies to include sleep; activity; rest; adjusting the core body temperature; hormone secretion; melatonin levels (melatonin is inhibited by light and causes drowsiness); biological drive; and emotional/psychological behaviors and processes.[3,4]

The release of neurotransmitters is involved with the mechanism of circadian rhythms. It is speculated that the SCN is densely innervated by serotonergic fibers.[3,4] Acupuncture can significantly influence neurotransmitter firing; the synchronization of neurotransmitters is important to athletic performance.

Biorhythms and Their Effects on Sports Performance

Definitional rhythms associated with human performance:

- Psychomotor rhythms influence performance through synchronization of neurotransmitters and motor neuron synthesis for reaction time and coordination.
- Physiological rhythms influence performance through synchronization of neurotransmitters; ATP-PC availability; lactic acid tolerance for speed; and the elasticity of muscle fibers for flexibility. They also influence the recruitment and growth of sarcomeres and ability to tolerate lactic acid for strength and power, and the ability of the athlete to create ATP and stress the heart to pump as efficiently and effectively as possible for endurance.
- Cognitive rhythms influence performance through memory, attention and assimilation.
- Psycho-emotional rhythms influence performance through experiential interactions, developing mental focus and concentration levels to include competitive pressures.

Many individual variables affect biorhythms, including lifestyle; behaviors; stress; eating habits; overtraining; chronological age; and genetic predisposition. These differences account for the athlete's individual peak performance that needs to be at a consistent level for elite athletic performance. Many athletes who tend to "get tired" during practice or training sessions are experiencing the effect of the mind and body naturally wanting to shut down to rest. This ultimately affects their quality of psychomotor; physiological; cognitive; and/or psycho-emotional rhythms. Therefore, this affects the athlete's potential for optimal performance, both individually and for overall team efforts. Thus, practices and training times need to be varied and/or held at multiple times throughout the day. Many elite athletes train multiple times a day for maximal recovery and training efficiency, which enables them to perform at a high level on a continual basis.

Correlation of Biorhythms and Enhanced Human Performance

An athlete's recovery time is extremely important, and sleep is his/her sanctuary. However, biorhythm synchronization can have the most influence during our waking time.[2] There are two classifications associated with optimal performance:

1. yang within yin risers (early risers) just as yang is moving into yin;
2. yang within yang risers (late risers), i.e. "night-owls."

(Note that there is a third classification: those who fall in between. These individuals have adaptability. Therefore, I am focusing on the first two classifications.)

These two classifications are important to sports performance because they can identify "peak" training times according to an athlete's energy level; mood; metabolism; concentration; and hunger levels, as they tend to be fairly consistent in experiencing individual highs and lows. These highs and lows influence the athlete's psychomotor; physiological; cognitive; and psycho-emotional functions of athletic performance. Athletic peak time presents when the athlete experiences his/her most efficient performance during training, while the lows present when the athlete experiences inadequate or decreased performance during training. Thus, yang within yin (early) risers experience their peak performance window when their natural cycles of metabolic, physical and mental alertness are all at their highest point in the yang within yin morning. These athletes wake up enthusiastic and full of energy. Conversely, the yang within yang (late) risers tend to experience their peak performance window (with peak metabolic, physical and mental alertness in their highest points) in the late afternoon, or yin within yang, aspect. These athletes tend to stay up late in the evening; are slow to wake in the morning; and take a few hours to get functioning and feel alert.

Biorhythms Imbalanced

All athletes experience "feeling off" when their performance lacks typical consistency. Their biorhythms are imbalanced. The following factors tend to affect athletic performance and individual biorhythms: emotional and mental stressors; extended travel across multiple time zones; extreme environmental changes; injury; and illness.

When this happens, we can adjust the athlete's biorhythms by re-synchronizing them. Mental imagery can be used to counterbalance mental, emotional and physical "out-of-sync" biorhythms. This technique is used as the athlete rests and shuts down for recovery. It is a very effective method used within sports performance.

We can also re-synchronize biorhythms by changing and/or developing consistent waking habits (waking at the same time every day).[5,6] These are triggered by steady bedtime habits. Another technique is using an alarm clock and bright lights to control wakeup times that correlate with anticipated time zone daylight times, two to three days before traveling.[6] Acupuncture and Chinese medicinal herbs are extremely effective for counterbalancing the jet lag many athletes experience when traveling to and from competitions, which is associated with imbalanced biorhythms.

Summary

Influence of biorhythms within the sports performance arena can impact optimal training performance from two perspectives: first, the influence of optimal training performance to prepare athletes for high-level competition; second, to anticipate and prevent potential injuries. This correlates directly into competition. For many track athletes, a difference of between 1/100 - 1/1000 of a second can be the difference between qualifying times and/or gold, silver or bronze medals. By integrating the awareness of biorhythms and the concepts of the Eastern philosophies of *qi*, blood, body fluids and peak training times on an individual basis, we can maximize training quality and efficiency more consistently. Synchronizing the training schedules of the athletes with their natural rhythms to enhance overall sports performance adds another variable that truly influences optimal result-oriented outcomes in the long term. In turn, this will facilitate athletic precision through the achievement of more frequent ideal performance states and long-term injury prevention.

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