Arousal Control for Track and Field

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Isaac Asimov noted in the "relativity of wrong" that there are no absolute rights and wrongs and that all theories are wrong. Experienced coaches know that:

1. one method or theory may work for some athletes but not for all athletes, or
2. what works for a time period with one athlete may not work with the same athlete at a later time period.

Progress is made when we as coaches and scientists recognize a good concept and refine and extend it more subtly, usually through advancement of instruments or measurements. This I believe is the case of the concept of 'arousal'. Several theories of how and why arousal works have been around for decades and coaches have applied these concepts to millions of track and field trials. But newer instruments or measurements are available to help 'refine' the arousal level of athletes.

What is Arousal?

Arousal is the physiological change, typically the central and autonomic nervous systems, that occurs when demands are made upon the person, be they:

1. physiological, such as exercising,
2. psychological, such as nervousness prior to competition,
3. behavioural, such as interacting with others, or even
4. small physiological changes to environmental events such as temperature, air pressure, etc.

Most changes occur under subconscious processing but some are readily observable or felt by the athlete. Arousal is often used synonymously with activation but anxiety is not the same.

1. Anxiety refers to a mind state of uneasiness about undefined threats or worries and usually increases arousal.
2. Anxiety has also been associated with the level of self-confidence of the athlete.

Fear is identifying the upcoming threat and typically has high levels of arousal associated with such. Fear comes when the athlete knows s/he is not prepared for the level of performance required and when the outcome of failure is important to the person.

What is important for the coach/athlete is to know that arousal control is a complex system of neural networks within the brain that control which systems respond and the intensity of those systems. To appreciate this complexity, imagine taking several transparent road maps and stacking them offcentre upon one another, noting the myriad of possible routes. This explains why it is so difficult for an athlete to consistently fine tune how, when and to what degree s/he responds.

Arousal is controlled by:

1. conscious mechanisms
2. pre-conscious mechanisms (with training or instruments can be made conscious), and
3. subconscious mechanisms.

The state of arousal affects one's:

- thoughts,
- feelings, and
- performance.

The daunting task of training the ultimate control system, the brain, has resulted in most coaches and athletes reverting back to training the body for performance, with hopes the mind will follow. Fortunately, the human brain has flexibility and learning embedded within its structure and may indirectly learn what is required for sport performances. However, newer research has shown that with specialized knowledge and equipment, the brain can be trained for specialized functions such as attention or arousal control

Why should coaches and athletes care about arousal?

Arousal affects one's:

1. perception
2. attention
3. reaction time
4. speed and strength of movements, and
5. decision-making abilities

In short, the quality of performance is affected in both practice and competition by the level of arousal.

Most athletes and teams report their best performances when they felt more relaxed, and less anxious. Research suggests that as athletes become more aroused, they often become more anxious. Because high anxiety has been shown to decrease one's performance, for most athletes a lower anxiety level is important. It is important to note that not all high-arousal states cause anxiety. Some athletes' ideal performance state is when they feel 'hyped or juiced', with or without accompanying anxiety.

High anxiety in athletes typically results in lower levels of self-confidence. Coaches know, and research confirms, that athletes with lower self-confidence seldom perform up to their capabilities. Interestingly, a new research study shows that athletes with high self-confidence may find anxiety beneficial to their performance.

In my experience, most non-performance states of 'choking' or 'couldn't put it together' have increased anxiety or inappropriate arousal levels as root causes. This can occur even in world-class athletes.

In summary, the athlete's training and competition programs have to be individualized to account for the different states of arousal, anxiety and confidence which interact with the physical conditions and load requirements to create an optimum performance level.

How do coaches find and train the right performance states?

In fine-tuning the performance state, the coach must first know the arousal state necessary for each event or even sections of one event. What the athlete does to get out of the blocks quickly is not the same arousal necessary for the sprint to the end.

Knowledge of the Event

Some coaches either ignore the arousal state of the athlete or tend to offer training programs that are generally designed for lowering arousal levels for all athletes. This may not be productive in terms of use of training time and may be counterpro-