

## Implementation of Motor Behavior Concepts for Elite High Jump Programming

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### Possible Causes of Faults During the Learning Process

- A. Misinterpretation of kinesthetic feedback
  - 1. Obtaining maximum frequency during the first half of the approach might result in the athlete feeling fast as they prepare to take off but will result in a lessened momentum index and poor neuromuscular facilitation.
  - 2. Bounding steps during the approach might utilize elastic energy systems and increase vertical velocity awareness but in fact result in slower approach speeds and increase approach accuracy problems.

### Possible Causes of Faults During the Learning Process

- B. Poor motor abilities
  - 1. Tight erectors combined with shortened iliopsoas muscle result in increased antversion of the pelvis. This lessens sprint efficiency and creates havoc in setting up the takeoff apparatus.
  - 2. Poor dynamic balance of the lower leg can result in less efficient use of the foot as an elastic spring mechanism both while sprinting and while jumping.

### Possible Causes of Faults During the Learning Process

- Misunderstanding movement concepts
  - 1. Flexion of the trunk forward to gain a more forceful takeoff in fact causes severe deceleration and fatal rotational movements.
  - 2. Opening the takeoff foot prior to planting combined with premature shoulder rotation will result in getting the back to the bar but creates a much flatter parabolic path and creates numerous lower leg injuries.

### Possible Causes of Faults During the Learning Process

- Negative interference from another technique
  - 1. A rigorous adherence to cycle kinesthetics will result in a poor setup for takeoff.
  - 2. Arm mechanics taught in gymnastics can reduce run up speeds and create dysfunctional preparation for takeoff.

### Possible Causes of Faults During the Learning Process

- Insufficient background in fundamentals
  - 1. The inability to run an approach with uniform, maximal controlled acceleration will result in reduced force application at takeoff.
  - 2. The lack of free limb mechanics will not only affect vertical force production but can also create parabolic flight curve problems.

## Possible Causes of Faults During the Learning Process

- Interference of poor learning environment
- 1. Peer pressure is not always beneficial.
- 2. Constant negative feedback without positive alternatives can be demoralizing.

## Possible Causes of Faults During the Learning Process

- Premature introduction of strength or speed into the new skill
- 1. Increasing a jumper's length of approach will normally result in greater speeds at takeoff, but if the "preparation for jumping" concept is not stable, then progress will be limited.
- 2. Static strength gains may reduce elastic output and/or synchronization.

## Possible Causes of Faults During the Learning Process

- Lack of physical abilities required by the skill
- 1. Weak or injured hip musculation will result in reduced run velocities and submaximal takeoff forces.
- 2. Poor starting strength value limits approach starting forces and in addition restricts change in direction speeds.

## Possible Causes of Faults During the Learning Process

- Fear of injury
- 1. Sacroiliac injuries lead to protective postures both during the run up and throughout the takeoff movement.
- 2. The inability to land on the shoulders and roll with the momentum can create clearance difficulties and often promote injury.

## Possible Causes of Faults During the Learning Process

- Poor demonstration or explanation of skill
- 1. Numerous studies have shown that what an athlete or coach thinks is occurring does not actually happen when analyzed scientifically.
- 2. Unique positions or movements by model performers may in effect be stylistic quirks and/or compensation movements.

## Possible Causes of Faults During the Learning Process

- Overtraining of technical concepts
- 1. Analysis can cause paralysis. Flow state dynamics are inhibited by constant evaluation noise.
- 2. The neuromuscular coordination environment demands an orientation to spatial or temporal cues specific to that moment and the physiological state of the athlete.

## Possible Causes of Faults in Established Techniques Already Learned

- Rational technique was not explained
- 1. Ineffectual posture during the last few strides of the approach due to a lack of understanding of acceleration and deceleration forces
- 2. The effective use of limbs to counter undesired rotational forces is often lacking in novices.

## Possible Causes of Faults in Established Techniques Already Learned

- Technique was not stabilized before competitions began
- 1. An athlete who exhibits technical mastery in training but reverts heavily to old motor behavior during the competition is in need of further stabilization methods.
- 2. Movements that look sound fundamentally but result in substandard results may be lacking in temporal rehearsal schemes.

## Possible Causes of Faults in Established Techniques Already Learned

- Injury has caused compensatory movements
- 1. Microtears in the lower hamstrings will result in amortization problems upon the plant of the takeoff foot.
- 2. Sacroiliac joint disturbance will limit hip undulation and oscillation. This in turn reduces run and takeoff efficiency.

## Possible Causes of Faults in Established Techniques Already Learned

## Poorly designed training programs

1. A lack of adherence to complimentary and compatible training principles can wreck skill coordination.
2. The inability to define over training symptoms results in skewed parameter development.

## Possible Causes of Faults in Established Techniques Already Learned

## Poor training conditions

1. Repetitive work on hard or fast surfaces may result in compromised amortization-elastic force dynamics.
2. Attempting high intensity effort on less than optimal surfaces will result in a compromised takeoff scheme.

## Possible Causes of Faults in Established Techniques Already Learned

## Technique is incompatible with lever system

1. A style that was effective at a particular level of strength and speed may have to be modified once new parameters are achieved.
2. The use of free limits changes as velocities increase.

Possible Causes of Faults in Established Techniques Already Learned

Coach lacks knowledge as athlete progresses

1. A sound foundation in biomechanics can save one years of experimentation looking for answers to annoying disturbances that are systemic.
2. The violation of kinesiological premises is rampant in the art and the literature.

Possible Causes of Faults in Established Techniques Already Learned

Poor physical condition results in compensatory actions

1. A lack of eccentric strength will limit elastic energy production.
2. Imbalances between the iliotibial band tracts and the adductor magnus will prevent efficient curve running dynamics.

Possible Causes of Faults in Established Techniques Already Learned

Poor technical model

1. The biomotor qualities of each individual athlete dictate stylistic peculiarities.
2. A common denominator analysis of both "intra" and "inter" trial efforts may reveal the "truth" much more readily than just blindly copying the current world leader.