Key Factors in Developing Better High Jumpers

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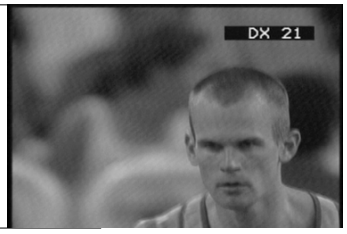
Program Considerations

- Primary components of your program
  - Skill (technique)
  - Speed (accelerations & running paces)
  - Strength (weights, plyometrics, and core exercises)
  - Stamina (volume management in each area above)
  - Suppleness (static and dynamic)

High Jump Phases

1. Approach
2. Take-off
3. Clearance



Keys to a Good Approach

- Posture
- Horizontal Velocity
- Lowering Center of Mass

Posture

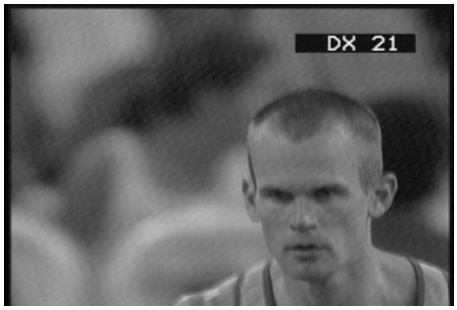
- Line from head to toe during acceleration
- Shoulders on top of hips posture during approach
- Posture over penultimate vertical
- Good Posture Developed Through
  - Awareness
  - Core Strength

Horizontal Velocity

- Rhythm of run-up
  - As the athlete approaches the bar their rhythm frequency (Hz)* should increase as flight times decrease and ground contact times vary slightly.
  - https://www.youtube.com/watch?v=3tESxZkfR-Y
- Tempo (speed) of run-up
  - "A fast approach can help the athlete to exert a larger vertical force on the ground during the takeoff phase" (*Dapena, 1992*)
- Creating Horizontal Velocity Can Be Trained Through
  - Plyometrics and Strength Training
  - Single Leg Support Exercises
  - Core Strengthening Exercises
- *one cycle per second

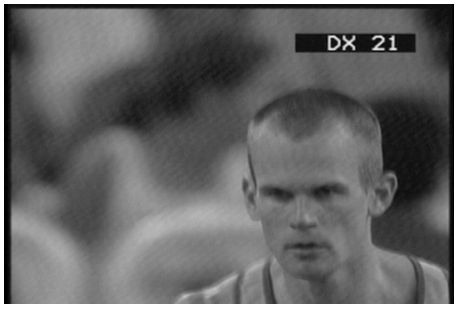
Lower Center of Mass

- "In the last two or three strides of the run-up the athlete should gradually lower the hips. It must be stressed here that this lowering of the hips has to be done without a significant loss of running speed" (Dapena, 1992)
  - Lower CoM through lean
  - Lower CoM through bridging over foot
- Lowering Center of Mass Requires
  - Leg strength
  - Strong Running Mechanics
  - Good Posture



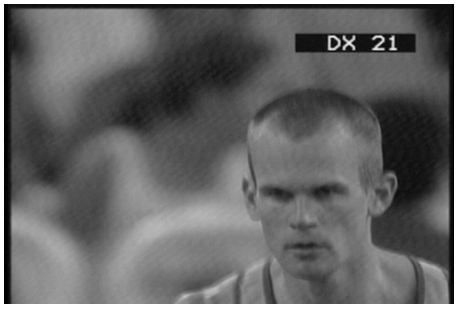
Traits of Good Approach

- Aggressive tempo
- Building rhythm
- Shoulders over hips posture
- Lowering center of mass before takeoff



Takeoff Conditions

- High height of center of mass at takeoff
- High vertical velocity of the center of mass at the end of the takeoff phase

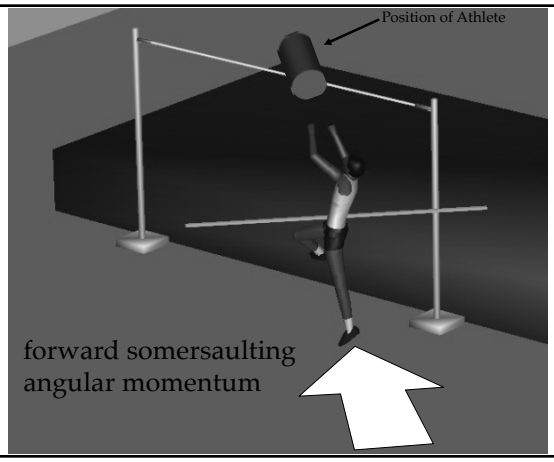


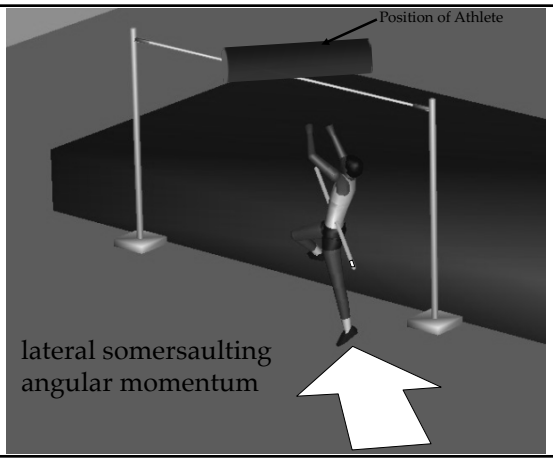
Takeoff Considerations

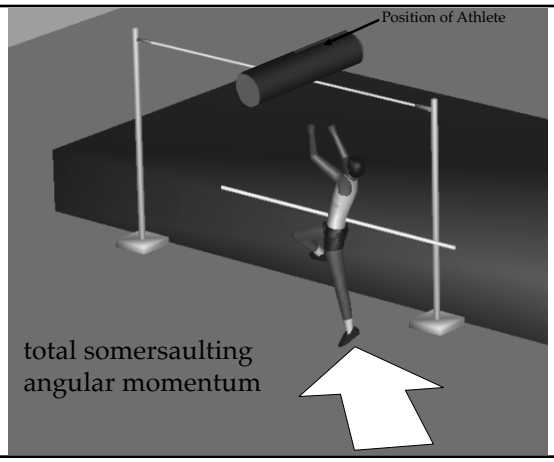
- Parallel vs Perpendicular attack angles
- Fast vs Slow approach speeds at takeoff
- Peaking in front, on top, behind bar
- *Forward vs Lateral somersaulting momentum*

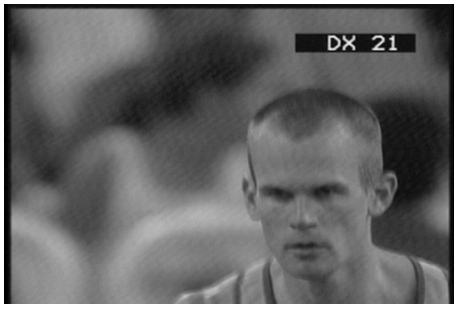
Total Somersaulting Momentum

- What is
  - o Forward somersaulting momentum
  - o Lateral somersaulting momentum
  - o Why is the combination of these two momentums important?









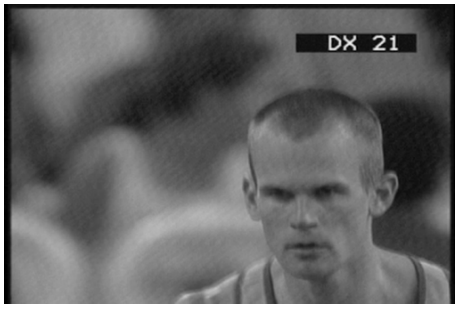
Bar Clearance Considerations

- Position at takeoff
- Somersaulting momentum
- Rotation about bar

Bar Clearance Considerations

- Taking off too close or too far from the bar
- Insufficient amount of somersaulting angular momentum
  - Moment of Inertia
    - "…if all parts of the body are kept close to the center of gravity, the moment of inertia of the body is small and the speed of rotation is increased" (Dapena, 1992)
- Poor arching
  - Short vs long body/limbs
- Bad timing of the arching/un-arching process

(Dapena, 1992)



Thank You!

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