100-meter Hurdle Technical Analysis

Loren Seagrave
Speed Dynamics

CONFIDENTIAL - Speed Dynamics

Global Overview of 100-meter Hurdles

- The 100/110m Hurdles is not one race, It can be thought of as a series of 11 interconnected maximum accelerations
- Hurdlers must bring their speed to the event
- Everyone is a Hurdler until proven otherwise

CONFIDENTIAL - Speed Dynamics

Global Overview of 100-meter Hurdles

- Is the Technical Model for the Women's 100-meter Hurdles Different From The Men's 110-meter Hurdles?
- What Should Be The Philosophical Approach In The Women's 100-m Hurdles?
- Is Drill Technique Interfering With Execution of The Advanced Technical Model

CONFIDENTIAL - Speed Dynamics

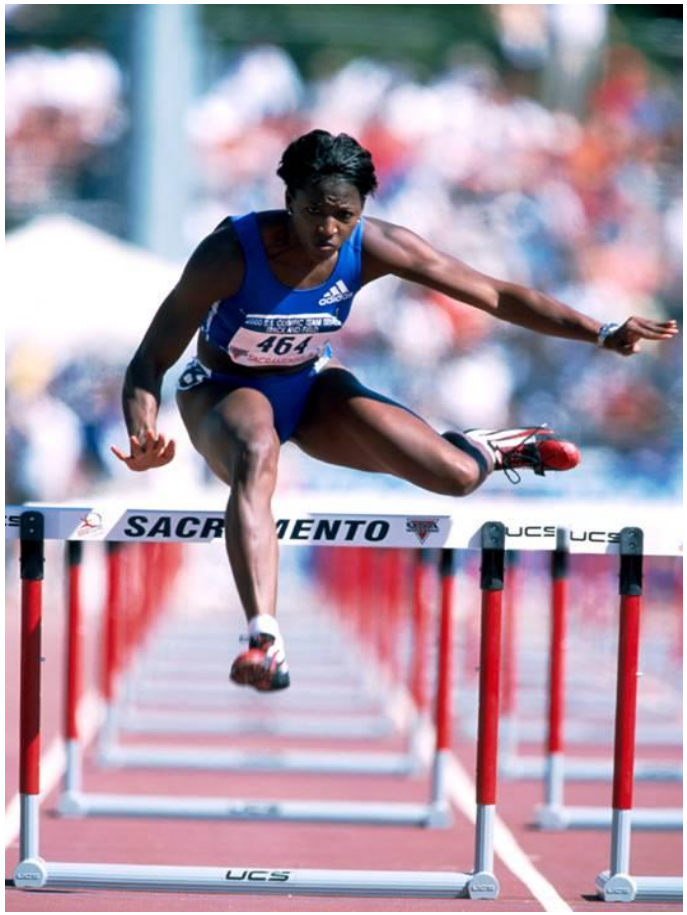
Race Model for the 100-meter Hurdles

Pure Acceleration	Transition	Maximum Rhythm I	Maximum Rhythm II	Re-Acceleration
13 meters	25.5 meters	25.5 meters	25.5 meters	10.5 m
IN O IN	O IN	O IN	O IN	O IN
0m 13m		38.5m	64m	89.5m 100m
	H1 H2 H3	H4 H5 H6	H7 H8 H9	H10
PushPushPush	Drive Taller	Quick Rhythm	Grab Back	Hot Track
Hip Extension Acceleration	Hip Extension Vmax	Hip Flexion Vmax	Hip Extension Vmax	Hip Flex Vmax
Ground Prep Focus	Ground Prep Focus	Recovery Focus	Ground Prep Focus	Recovery Focus

CONFIDENTIAL - Speed Dynamics

Key Components of the 100-meter Hurdles

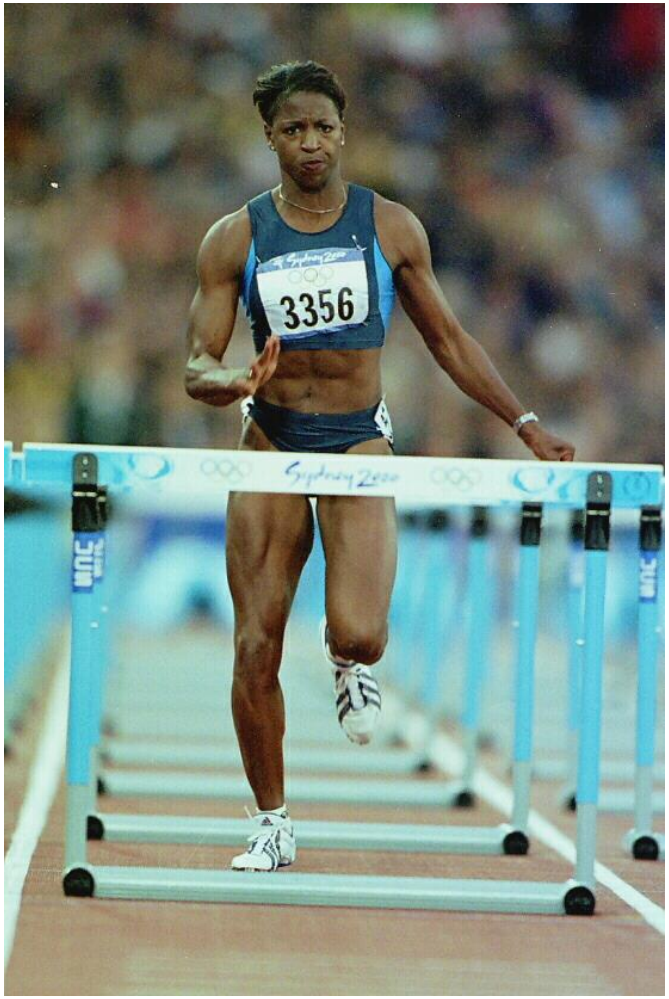
- Start and Acceleration
- Preparation for Take-Off
- Take-Off
- Lead Leg Attack
- Trail Leg Recovery
- Lead Leg Landing
- Trail Leg Re-Acceleration
- Arm Action



CONFIDENTIAL - Speed Dynamics

Often Forgotten Components of the 100-meter Hurdles

- Strides between the Hurdles
  - Lead Leg Landing
  - Trail Leg Re-Acceleration
  - Air Phase after Re-Acceleration with Trail Leg
  - Range Step (Wells, T)
  - Quick (Take Off Prep)
- Under-emphasis of Active Trail Leg Re-Acceleration
- Under-emphasis of a Continuous Active Arm Action



CONFIDENTIAL - Speed Dynamics

The Sprint Hurdles Start

- Not Appreciably Different from Sprint Start for Women Depending on Power to Body Weight Ratio.
- Must Be Consistent in Technical Execution

CONFIDENTIAL - Speed Dynamics

Acceleration to the 1st Hurdle

- Not Appreciably Different from Sprint Acceleration for Women Depending on Leg Length and Power to Body Weight Ratio.
- Must Have Consistent Acceleration Pattern to Deliver the Hurdler to the Identical Optimal Take Off Point
- Utilization of the

CONFIDENTIAL - Speed Dynamics

1st Hurdle Preparation for Take-Off

- Drive the hips over the hurdle from the impending lead leg (Range Step)
- Little or no deviation from late Pure Acceleration Mechanics
- Take Off Distance is marginally closer than that of [illegible]

CONFIDENTIAL - Speed Dynamics

1st Hurdle Take-Off

- Continued Acceleration Action Through the Hurdle
- Firm Foot Initiates Ground Contact

CONFIDENTIAL - Speed Dynamics

Preparation for Take-Off and Take Off for Remaining Hurdles in Race

- Similar to Strategy Employed by Long Jumpers
- Active Foot Plant, Dorsi-Flexed Ankle, Ball of Foot

CONFIDENTIAL - Speed Dynamics

First Hurdle Clearance

- Quality of Clearance Determined by Take Off
- Hip Distance Away from Hurdle While Foot Lands Behind hip

CONFIDENTIAL - Speed Dynamics

Lead Leg Attack Mechanics

- Take Advantage of Ground Reaction Force from Range Step
- Advanced Technical Model Focuses on Pop the Thigh Forward
  - Lack of Early and Aggressive Hip Flexion often results in Lead Leg Locking over the hurdle

CONFIDENTIAL - Speed Dynamics

Trail Leg Recovery Mechanics

- Trail Leg Knee Must race the Opposite Side Hand (McFarlane, B)
- Trail Leg Must be at Full Flexion and in Sagittal Plane at Lead Leg Landing

CONFIDENTIAL - Speed Dynamics

Lead Leg Landing Mechanics

- Lead Leg Negative Thigh Speed Impacted by Trail Leg Thigh Recovery Speed
- High Negative Foot Speed at Touch Down
- Minimal or No Frontside Distance
- Dorsi-Flexed Ankle (Males: Plantar-Flexed)
- Shin Sinks while Hip Continues to Extend
- Only 50% Negative Vertical Velocity Handled by Lead Leg

CONFIDENTIAL - Speed Dynamics

Trail Leg Re-Acceleration Mechanics

- Trail Leg Aggressively Windmills into Active Negative Thigh Acceleration
- Reduced Air Time Allows Remaining Negative Vertical Forces to be Handled by Trail Leg
- Often Action is Inhibited by Opposite Arm Lingering Behind the Body

CONFIDENTIAL - Speed Dynamics

Second Step Mechanics (Range)

- Explosive Projection of the Hips Toward and Over the Hurdle Rail

CONFIDENTIAL - Speed Dynamics

Preparation for Take-Off (Quick)

- Reduce Range of Motion by Keeping the Foot Low on Recovery (Step Over the Ankle)
- Attempt to Reduce Air Time and Catch the center of Mass on its Ascending Ligand

CONFIDENTIAL - Speed Dynamics

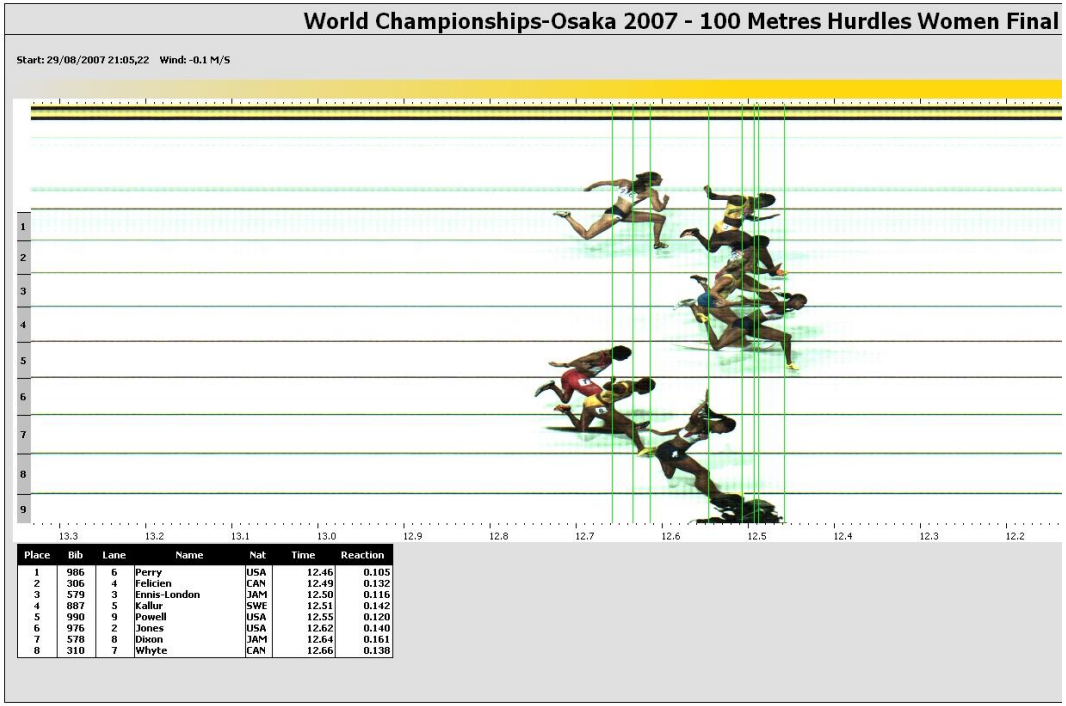
Re-Acceleration Off Last Hurdle

- An Opportunity to Snatch Victory Away from Defeat
- Always Can Reach higher Speed than in Race as There are Two to Three Additional Steps
- Must be Continually Rehearsed

CONFIDENTIAL - Speed Dynamics

Finish Technique

- Finish Technique must be regularly rehearsed if It is to be properly executed under pressure of competition



Place	Bib	Lane	Name	Nat	Time	Reaction
1	986	6	Perry	USA	12.46	0.105
2	306	4	Felicien	CAN	12.49	0.132
3	579	3	Ennis-London	JAM	12.50	0.116
4	887	5	Kallur	SWE	12.51	0.142
5	990	9	Powell	USA	12.55	0.120
6	976	2	Jones	USA	12.62	0.140
7	578	8	Dixon	JAM	12.64	0.161
8	310	7	Whyte	CAN	12.66	0.138

CONFIDENTIAL - Speed Dynamics