

Key Concept

- The childhood years should be focused on > Throw developing basic Catch motor competence and efficient body mechanics in a wide variety of movement skills and situations.
 - > Kick/Punt
 - > Strike

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Throwing

- A critical skill that is used in many sports.
- Proficient Overhand Throwers:
- ≻ Long contralateral step
- > Segmental rotation of the trunk where the hip rotates first, followed by the spine, shoulder, humerus and forearm
- Humerus lags behind trunk
- > Forearm lags behind humerus
- Throwing arm follows-through across body upon ball release

Throwing Development

- <u>Total Body</u>
- \circ 1- Chop
- \circ 2 Sling Shot
- \circ 3 Ipsilateral step
- \circ 4 Contralteral step
- \circ 5 Wind up

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Throwing Constraints				
Individual	Task	Environmental		
Gender	Accuracy	Size of Target		
Age	Force	Distance from target		
Biological		Instruction		

Throwing Constraints

- Throwing is a projection skill. The development of throwing is not linear or prescriptive, rather dynamic & variable in nature.
- Teachers can often elicit a more advanced pattern of throwing by considering individual constraints, & changing the task & environmental constraints to demand such a performance.

Summary of Throwing Research

- Gender differences boys better than girls even after throwing intervention.
- > Children exhibit variable, non-linear and context sensitive emergence of throwing behaviors.
- Throwing instruction (models, critical cues, biomechanical) positively impacts throwing performance.

Summary of Throwing Research

- Process measures of throwing are more sensitive to instruction than product measures such as velocity.
- Long contralateral step is important in order to begin rotating the trunk on the legs.
- During initial instruction of the overarm throw; the focus should be on throwing for force to evoke the most efficient pattern.

Proficient Catchers:

Catching is a critical reception skill used in many sports.

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Proficient Catchers:

- > Preparation for Catching
 - \succ Track the ball with the eyes
 - > Align body with incoming flight characteristics of object
 - > Feet are placed slightly apart
 - \succ Prior to catch, arms relaxed at side or slightly in front

\succ Reception of the Object

- Hands move to intercept the object fingers adjust to precise spatial characteristics of the object (fingers up for high ball, down for low ball)
- > Arms "give" on contact to absorb the force of the ball
- > Fingers grasp object in well-timed simultaneous action
- > Body weight transferred from front to back as arms give

Catching Development

• <u>Total Body</u>

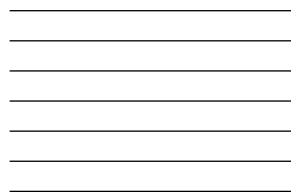
- \circ 1- Delayed reaction
- \circ 2 Hugging
- o 3 Scooping
- $\circ\,4$ Hand catch
- \circ 5 Move to ball & hand catch

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Catching Constraints

Individual	Task	Environmental
Gender	Ball location & flight trajectory	Size of ball
Age	Distance & height	Ball color & background
Experience	Ball speed	Viewing time
Body parameters		Instruction



Catching Constraints

- Catching is a reception skill & a hard skill to research as the nature of the catching task used in research is so variable, thus task & environmental variables impact the pattern of catching resulting in contradictory findings.
- Researchers have used both product & process approaches to researching catching.

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Summary of Catching Research

- > Valid developmental sequences exist for catching.
- Gender differences are present in stages of catching with girls better than boys in the early years.

Summary of Catching Research

- ➢ Individual, task and environmental constraints influence catching performance.
- Instruction positively impacts the performance of catching with the emergence of catching development shaped by the nature of the instruction provided.

Proficient Kickers

Preparatory Action

Continuous motion into ball

- ≻Long last step (or leap) before ball
- Stabilizing foot beside / behind ball
- Trunk slightly leaned back

Proficient Kickers

- Manipulative leg starts back with knee flexed
- Forceful forward swing of leg with sequential inertia thigh rotates first followed by lower leg
- Leg straightens as it makes contact with ball
- Trunk leans back at contact

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Proficient Kickers

Follow Through

- Manipulative leg moves vigorously forward & upward often causing the stability leg to come off the ground & perform a hopping pattern
- Trunk leans backward
- Arms in opposition to legs to counter the rotatory forces of the leg

Kicking Development

- <u>Total Body</u>
- \circ 1- Stationary push kick no rear leg swing
- \circ 2 Stationary kick with rear leg swing
- \circ 3 Moving approach step/s & kick
- \circ 4 Leap-kick-hop Long last step before forceful kick & hop after

 Kicking Constraints

 individual
 Task
 Environmental

 Gender
 Instruction

 Footedness
 Experience/Skill

 Biomechanical
 Imb velocities

 Age
 Image descent

Proficient Sidearm Strikers

Preparatory Action

- ➢ Swinging bat back in horizontal plane
- ➢ Body oriented sideways

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Proficient Sidearm Strikers

Force Production

- > Long contralateral step into hit
- > Swing through full range of motion
- Differentiated trunk & hip rotation to contribute rotary forces
- Extend arms just before contact
- Combine sequence of movements (backswing, step, pelvic rotation, trunk rotation, arm swing, ball contact, follow through) to maximize forces

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Proficient Sidearm Strikers

Follow Through

Arms comes across bodyBody moves across base leg

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Proficient Batters

Preparatory Action

> Body oriented sideways with weight on back leg

Step & weight shifts forward as hands go back

Proficient Batters

Force Production

- > Contralateral step into hit
- Swing through full range of motion
- Differentiated rotation to contribute rotary forces
- > Extend arms just before contact
- Combine sequence of movements (backswing, step, pelvic rotation, trunk rotation, arm swing, ball contact, follow through) to maximize forces

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Proficient Batters

Follow Through

- ≻ Wrist roll
- ➢ Bat swings across body
- > Weight shifts to front foot

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Striking Development

- <u>Total Body</u>
- 1- Chop strike with bat going from high to low
- 2 Push strike sideways orientation, bat pushes across the midline with block rotation of trunk
- > 3 Ipsilateral step (back foot steps across the front foot) as bat swings down diagonally
- > 4 Contralateral step starts with arm/bat wind up - contralateral step as bat swings wrist roll & follow through

Striking Constraints				
Individual	Task	Environmental		
Gender		Nature of practice		
Age		Peer tutoring		
Proximo-distal		Nature of feedback		
Haptic (touch)		Prior experience/ expertise		

5 Step Process to Track & Utilize Fundamental Motor Skill Development

- Observe & evaluate developmental level of child
- \succ Identify desired performance for child to perform
- Consider individual factors influencing child
- Manipulate environment & task factors to promote success
- Watch child perform skill & modify it to make more difficult or easier

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Concluding Concept

<u>Concept 11.4</u> – Developmental sequences can be identified for many FMS. These common patterns of movement are behavioral attractors that represent movement options from which a child can chose in a given movement context.