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Maximising Skill Acquisition for Softball

AIS Skill Acquisition



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Session Aims

1. Detail the non-negotiable principles of Skill Acquisition.
2. Discuss some of the research findings and the implications for coaching.
3. Provide a few brief activities to demonstrate some of the practical applications of Skill Acquisition.



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Skill = Technique + Pressure



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Non-Negotiable Principles



1) Practice Specificity



- “Transfer of practice to game conditions depends on the extent to which practice resembles the game” (Magill, 1993)
- How does this activity/drill relate to the game?
- Replicate as many of the game principles as possible eg. pressure, fatigue, motor skills



2) Practice Volume

- **Deliberate Practice Theory (Ericsson et al., 1993)**
 - 10 Years or 10,000 hours of practice required to attain expert levels
 - Goal-oriented
 - Well-defined and structured
 - Typically repetitious
- Past participation in other activities can reduce the amount of hours of deliberate practice needed to acquire expertise eg. basketball and invasion sports (Abernethy et al, 2002).
- Experts typically begin to specialise in their chosen sport between 13-15 years of age (Cote et al., 2003).



Practice Repetition



ACTIVITY	PERFORMER	REPETITIONS	ESTIMATE
Cigar Making	Young women	3 mill cigars	Crossman 1959
Football Pass	Quarterback	1.4 mill	15yr x 200d x 4hr x 2/min
Football Punt	Player	.8 mill kicks	200/day x 5 days x 45wks x 15 yrs
Baseball Throw	Pitcher	1.6mill throws	3/min x 80mins x 300days x 10 yrs
Netball Shot	Goal Shooter	598,000 shots	200d x 5 days x 46 wks x 13 yrs

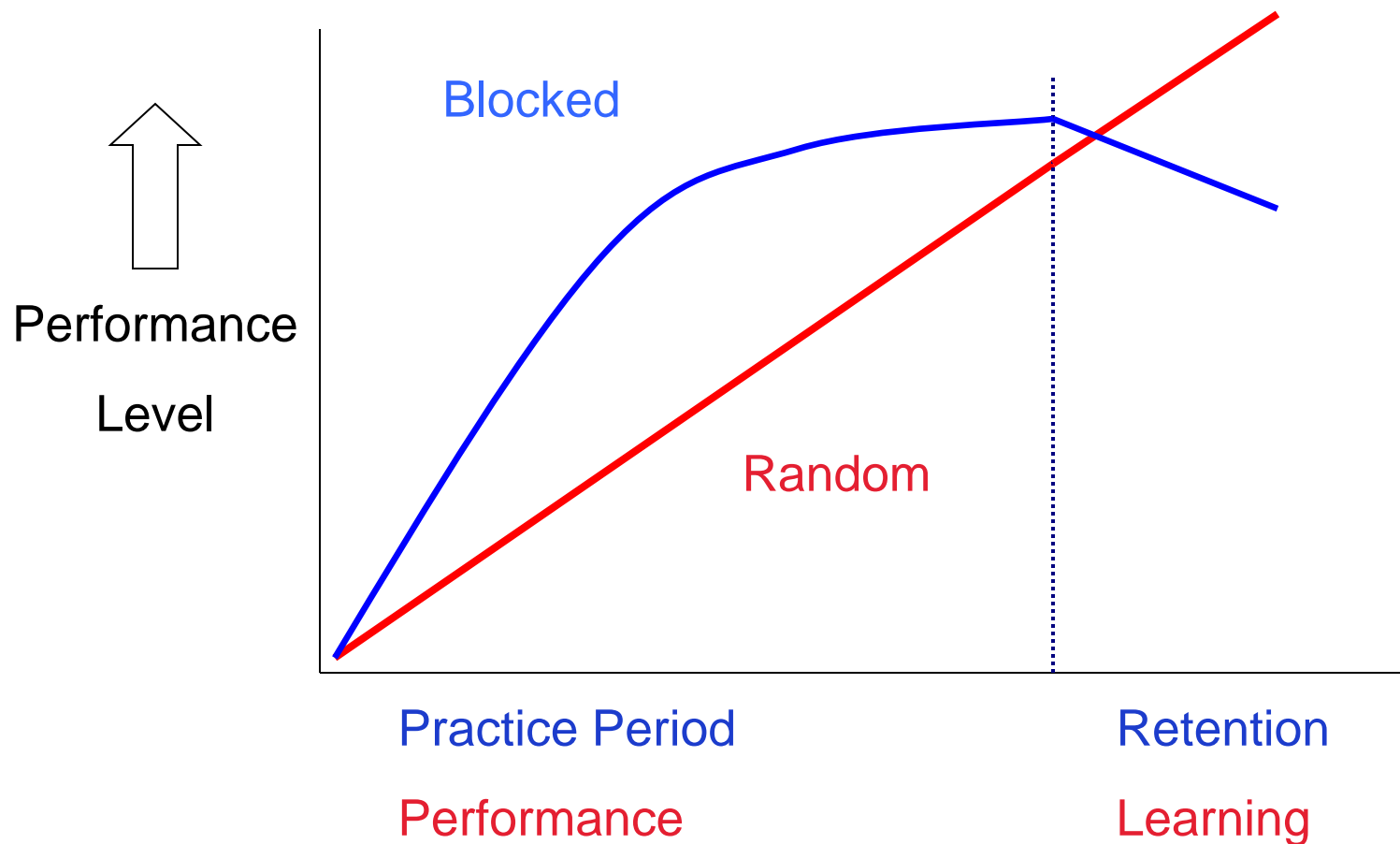


3) Practice Variability

- Generally it is considered advantageous to vary practice conditions to maximise retention and transfer of skill
- A key mediating issue is how the variable practice conditions are organized during a session
 - Infield throws to 1st base
 - Fly-ball catching drill
 - Ground ball fielding drill
 - Batting drill



Organising Practice





Applications

ATHLETE	SKILL	PRACTICE	INTERFERENCE
Beginner	Open Closed	Blocked	Low
Intermediate	Open Closed	Block/Random Random	Low/High High
Elite	Open Closed	Random	High



Applications

- Performance or learning
- Skill Circuits
- Feedback / Cognitive Intervention
- Matchplay / Strategy Practice

- Anything that causes players to revisit the skill



4) Learning Styles

- **Perceptual Preference (Learning Style)**
 - The sense through which athletes remember information most easily (hearing, seeing, or feeling/doing)
 - If coaches can cater for an athletes individual preference it individualises instruction & enhances achievement
 - Matched feedback for learning style

Learning styles questionnaire



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Video-Based Training

Some examples from other sports



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Cricket Batting Anticipation



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Waterpolo Goalie Anticipation



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Video-Based Training

Advantages

- Low impact
- Coach doesn't have to be present
- Portable (travel)
- Injured players
- Good fun (computer game)

Considerations

- Player perspective or broadcast footage?
- Life-size or computer screen?
- What instructions should be provided? (implicit/explicit)
- Complexity of image?



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Batting Concepts



Batting Research

- Physically impossible to watch the ball all the way to contact with the bat.

Skilled batters:

- Watch the ball for longer than lesser skilled.
- Have a more stable head position.
- Track the ball to a certain point and then jump to a point where they think it will contact the bat.
- Use information from the pre-release action of a pitcher.
- Watch the anticipated release zone (grip, wrist action, etc.)
- Also consider field settings, previous history of pitcher, state of game, etc.



Sports Vision Training



- Visual acuity, peripheral vision and depth perception.
- Expert-novice differences typically don't exist on generalised tests of visual function.
- Lack of a direct relationship between general visual skills and sports performance.
- Visual training programs using non-sport specific repetitive eye exercises don't work.

(Abernethy & Wood, 2001)



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Non-Sport-Specific Training



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Coaching Implications

- Increase speed of bat swing to almost as fast as possible (but not so fast that the movement becomes uncoordinated).
- Still useful to say “watch the ball onto the bat” to encourage visual tracking of ball flight.
- Keep head stable (weighted hats?)
- Keep the swing consistent in terms of speed and backswing position.
- Adjust initiation of movement to get accurate timing.
- Watch release point of pitch and develop anticipation.
- Overload training of perceptual capacities:
 - Coloured ball drills (traffic lights), video training, eyes closed, dish-glove



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Lessons from Cricket



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When facing a bowling machine:

- Batter moved front foot into position earlier.
- Greater variation in initiation of backswing.
- Could anticipate delivery easier.

Problems:

- Stroke selection made too early.
- Timing errors.

Suggestions:

- Use machine for teaching technique.
- Use real bowlers for teaching timing. (Gibson & Adams, 1989)

Are drills such as “soft-toss” worth doing?



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Pitching Concepts



Skilled Pitchers



- Produce movements which are both smooth & highly efficient (minimal unnecessary ill-timed force production)
- Use consistent movements
- Superior force control



What batting research tells pitchers

- Disguise critical cues
- Present false cues
- Increase the number of possibly relevant cues
- Vary all possible dimensions of object flight
- Present critical cues as late as possible
(Glencross & Cibich, 1977)



Pitching Practice Strategies

- Ensure your pitching posture is consistently correct
- Develop ability to analyse your pitch based on ball flight
- Develop feel for your technique
- Use of targets
 - Some individuals predisposed to focus on movement mechanics = paralysis by analysis
 - Direct attention toward external effects of action, rather than limbs eg. look at the target (Johnny Wilkinson)



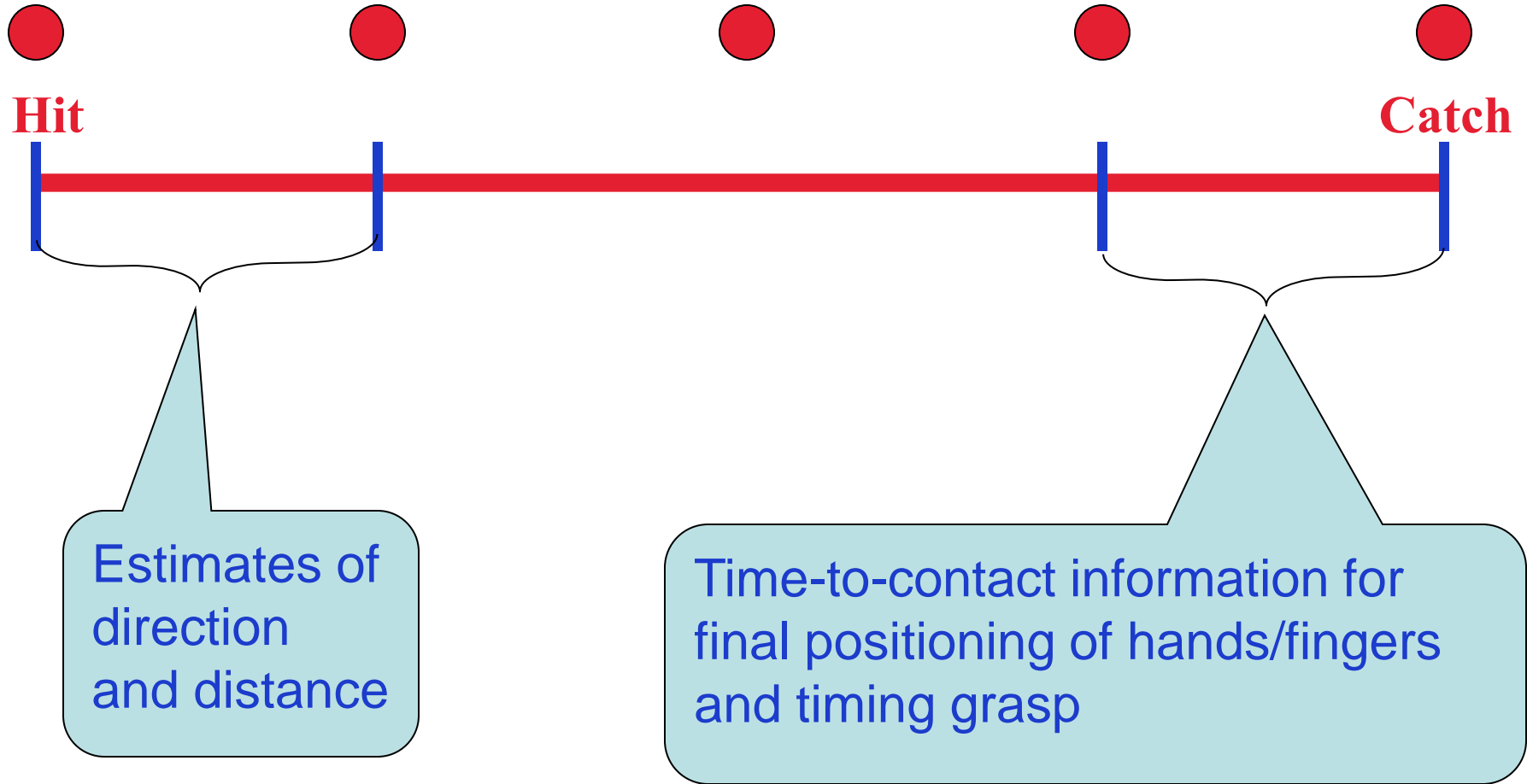
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Catching



Catching – Key Viewing Periods





Catching a Fly-Ball

- Foot movements first sign of response initiation.
- Non-expert catchers initiated foot movements earlier than experts but not always in correct direction.
- Experts waited until they had the key ball-flight information before moving in the correct direction.

(Oudejans et al., 1997)



Catching – Practice Considerations



- Learners need vision of their hands.
- Dual-task activities.
- Use coloured/striped balls to promote visual tracking.



Suggested Reading



Schmidt, R.A., & Wrisberg, C.A. (2004). Motor learning and performance (3rd ed.). Champaign, IL: Human Kinetics.

Magill, R.A. (2004). Motor learning and control: Concepts and applications (7th ed.). Boston: McGraw Hill.

Starkes, J.L., & Ericsson, K.A. (2003). Expert performance in sports: Advances in research on sport expertise. Champaign, IL: Human Kinetics.