

DEMONSTRATION AND VERBAL INSTRUCTIONS

DEMONSTRATION

- Modeling and observation learning
- Common way to provide information about how to perform a skill
- McCullagh and Weiss (2001) indicated demonstrations is more effective under certain circumstances.

WHAT DOES ONE "SEE" WHEN A SKILL IS DEMONSTRATED?

- *Seeing* is defined as what we perceive is important rather than *looking*
- We "see" and use the invariant features to develop *acquire a new pattern of coordination.*"

Research of Visual Perception of Motion

- Used a procedure call “point-light technique.”
 - Placed lights on the joint of person who is filmed performing a skill.

Point Light Technique

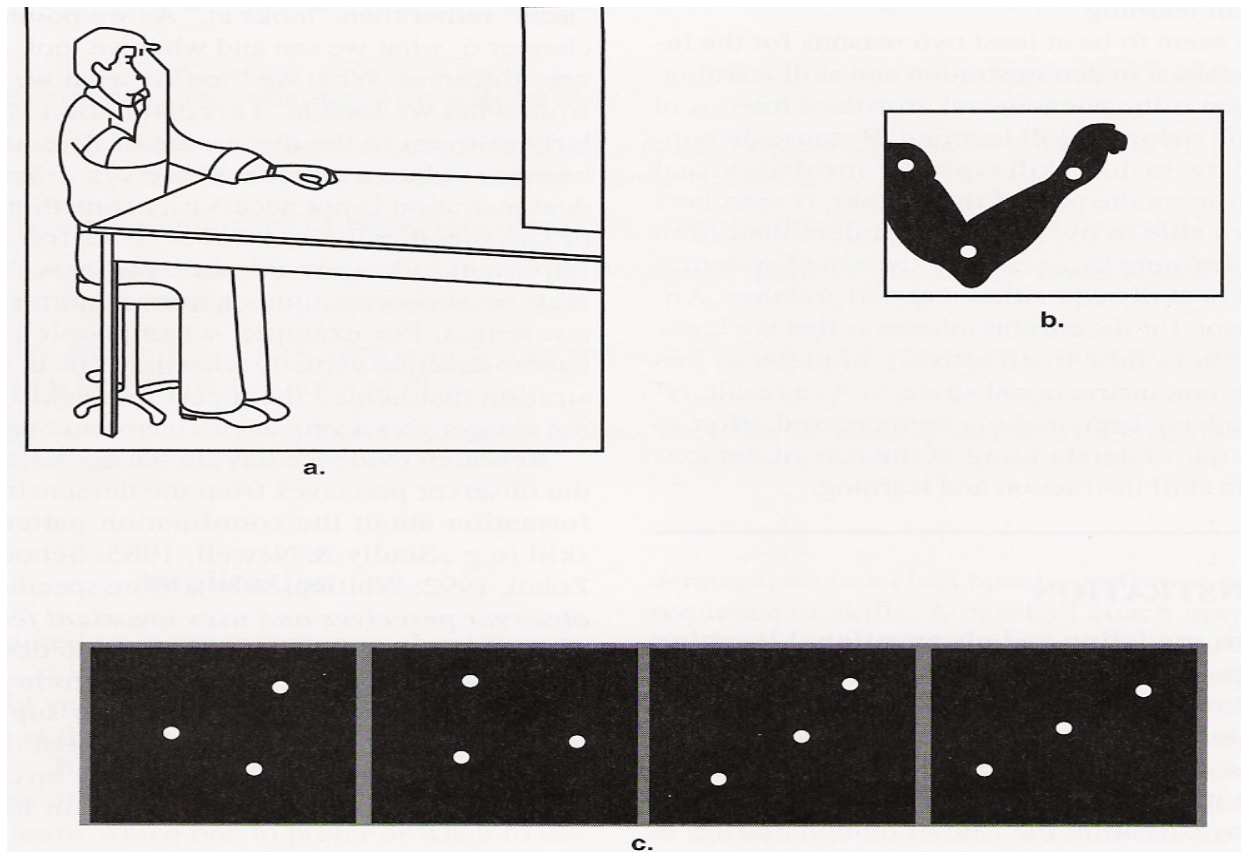


FIGURE 13.1 An example of use of the point-light technique in motor learning research. (a) shows the

Point Light Technique

The research using this technique found:

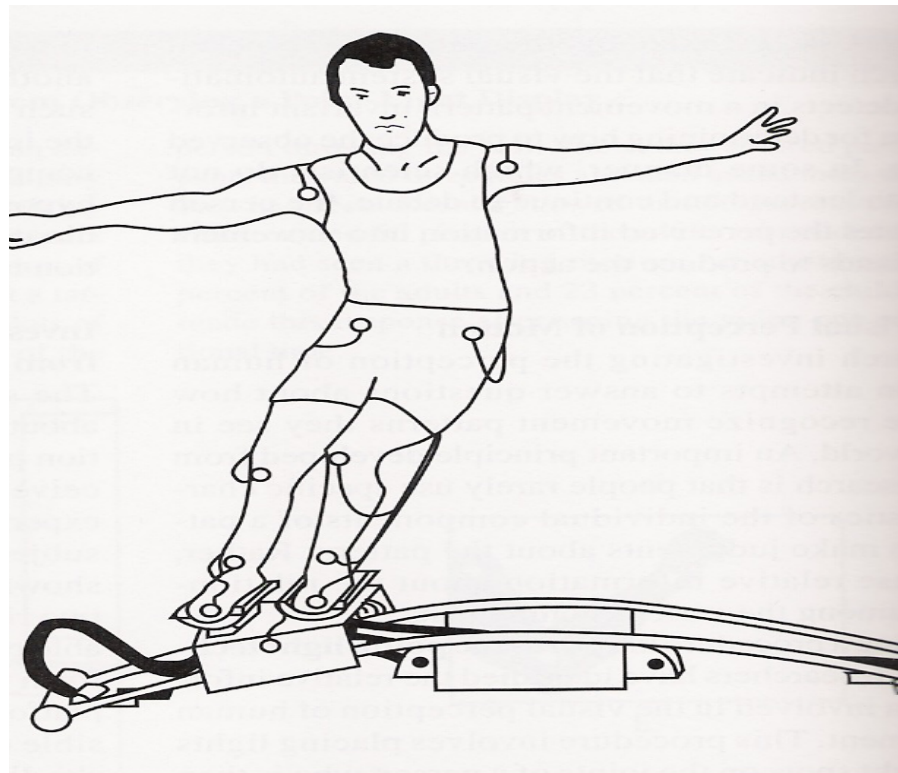
People can recognize different gait patterns accurately without seeing the entire body or limbs.

Invariant relationships in coordinated movement constitute the critical information involved in observation learning not the components of a movement

Ski simulator study

- Ski simulator study involving observing skill model performing the task or received verbal information.

Ski Simulator



Ski Simulator

Study showed that participant who observed the skilled demonstration developed coordinated movement patterns earlier.

SHOULD ONE DEMONSTRATE THE SKILL CORRECTLY?

- This research question is important for two reasons:
 - Quality of demonstration should affect information related to invariant movement patterns
 - Individuals picks up the strategies used by the model to solve movement problems.

Neural Basis for Observation Learning

- Mirror neurons (visuomotor neurons) in brain were active when we observe others perform.
 - Participants brain activity was assessed when viewing a whole-body gymnastic movement.
 - When participants were asked to observe with the intent to imagine themselves imitating the movement, supplemental motor area (SMA) of brain of the cortex was activated.
 - When participants were asked to judge the movement, the pre-SMA area was activated
- Results suggest that beneficial use of observational based therapy for rehab, especially for stroke patients.
- This hypothesis has yet to be tested!!

SHOULD AN UNSKILLED PERFORMER (Coping Model) DEMONSTRATE THE SKILL?

Discourages imitation of the skilled performance model; encourages active problem solving (*active learning*)

Decreases distress, demonstrates strategies, demonstrates progression, enhances self-confidence.

Research has shown that coping model is effective for early learner but not highly skilled.

WAYS TO EFFECTIVELY IMPLEMENT EFFECTIVE DEMONSTRATIONS

- Pair learners together in situations where one of the pair performs the skill while the other observes.
- Both the performer and observer is given verbal feedback by a knowledgeable person.
- Provide the observer with a checklist of key aspects of the skill. Observer should look for each aspect, check it on the list and then provide feedback
 - Observer engages in problem-solving activity which facilitates the up coming performance.

When should one demonstrate a skill (timing of demonstrations)?

- Gentile's contends the benefits of giving demonstration occur:
 - Before the person begins practicing the skill
 - When one continues to demonstrate during practice frequently as necessary
- Research
 - More frequent one observes a skilled demonstration, the more opportunity the beginner will have to acquire the movement (Corroll & Bandura, 1990)
 - Weeks & Anderson (2000) study indicated the importance of pre-practiced demonstrations over interspersed demonstration in both practice and retention.

AUDITORY MODELING

- What type of skills need auditory modeling?
 - Skills for which goal is to move in a certain criterion movement time or rhythm.
 - Dance steps
 - Moving to a specific pattern within a given time period (e.g. assemble line production or you only have six second to accomplish a sequences of movements)
- Compare a visual to auditory demonstration before practice
 - One group saw where the other group only had the audio portion of the skill; performers who hears the audio portion as compared to the vision did better.
 - Dance (Wuyts & Buekers, 1995)
 - Keyboarding (Lai, et al., 2002)

Why does observing of demonstrations influences learning?

- Cognitive mediation Theory
 - When we observe a model, we store information into a symbolic memory code for purpose of cognitive processing (rehearsing and organizing the information).

Continued

Why does observing of demonstrations influences learning?

- Dynamic viewing of modeling.
 - J.J. Gibson...questions the view of symbolic coding is mediator.
 - Visual system is capable of automatically processing visual information.
 - Visual system picks up invariant coordinated information based on movement of limb segments which was proven by point-light research.

Implementing Demonstrations

- Demonstrations has the greatest impact when the skill requires a new pattern of coordination.
- When learning a new skill use verbal cues with a visual demonstration
- Demonstrations should be frequent through practice
- Pre-practice demonstration result in better practice and retention performances.
- Provide feedback to learner when demonstrations are used as primary instruction tool to learn the skill
- Make sure the observer sees the critical features of the skill
- If you cannot demonstrate a skill correctly, use a coping model.
- Pair beginner together when learning a motor skill.
- Use auditory demonstration for skill that involve rhythm.

Part II

- Verbal Instructions and Cues

Why do we give instructions with a demonstration?

Instructions speeds the rate of learning a skill.

Factors to Consider when Giving Verbal Instructions

- Learner is limited in their ability to attend and remember
 - For the early learner or early rehab:
 - Don't complicate & minimize verbal instructions

Factors to Consider when Giving Verbal Instructions

Instructions directed to intended outcome of actions rather than on the movement themselves are more effective (Action effect hypothesis)

Two ways one can direct attention to movement outcomes:

- Present instructions that establishes a discovery learning situation.

 - *what will happen if you....

- Present instructions that involves the use of imagery.

Wulf & Weigelt Ski Simulation Study

- Demonstrated the discovery learning situation
 - Outcome was to continuously move left to right on ski platform for one complete cycle
 - Participants in one group were given instructions and other group (guided discovery) was not given any additional instructions only told about the action goal.
 - Guided discovery group was poor in practice but on retention test 3 days later out performed the instructional group.

Wulf, Lauterbach, & Toole (1999) study

- Demonstrated the metaphoric imagery concept
- College students practiced hitting golf pitch shots.
 - One group told to focus their attention on the swinging motion of the arms during each swing & provide instruction about the grip.
 - One group told to focus on head of the club pathway during the back and down-swing and image the club following pendulum like movement.
 - Group where they directed their attention to club movement were more accurate during practice and on retention.

Do we need to tell people....

- What to look for or looking at when they performed a skill?
 - People can learn to select relevant cues from the environment without being consciously aware of what those cues are!
 - People implicitly learn the critical environmental features that directed their movements.

WHEN DOES INSTRUCTIONS HINDER LEARNING?

When instruction about the movement features occur in situations where specific features looked for occur so *infrequently* in a series of trials.

Factors to Consider when Giving Verbal Instructions

Your instructions will bias the performer strategy to achieve the goal.

Verbal Cues

- Short, concise phrases that serve to:
 - Directs the performers attention to regulatory conditions
 - Prompts one to key on movement components of the skill

Cue Teaching in Badminton

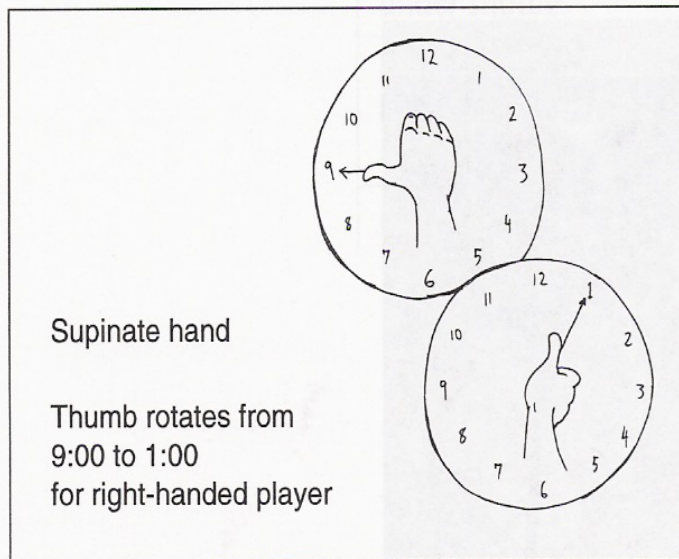


FIGURE 4.1 Hand Action for Forehand Overhead Clear

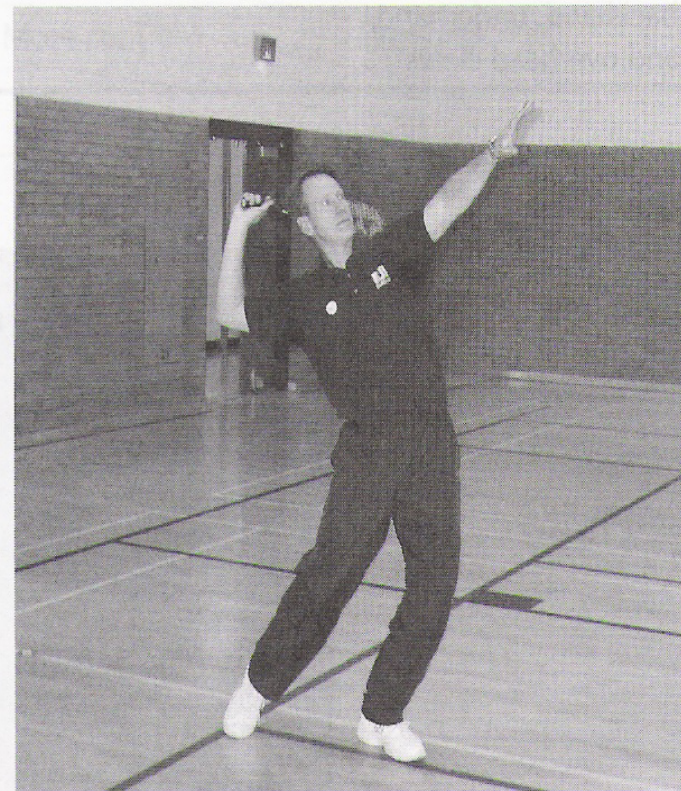
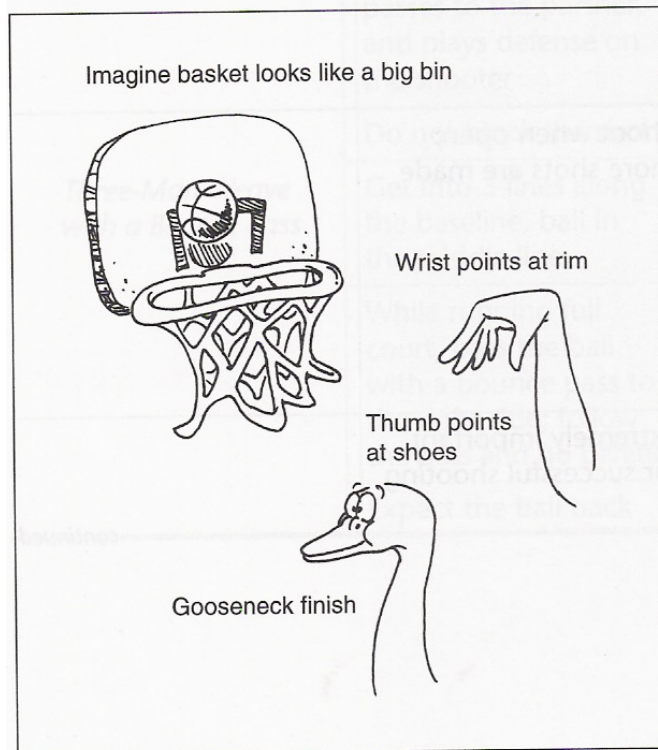
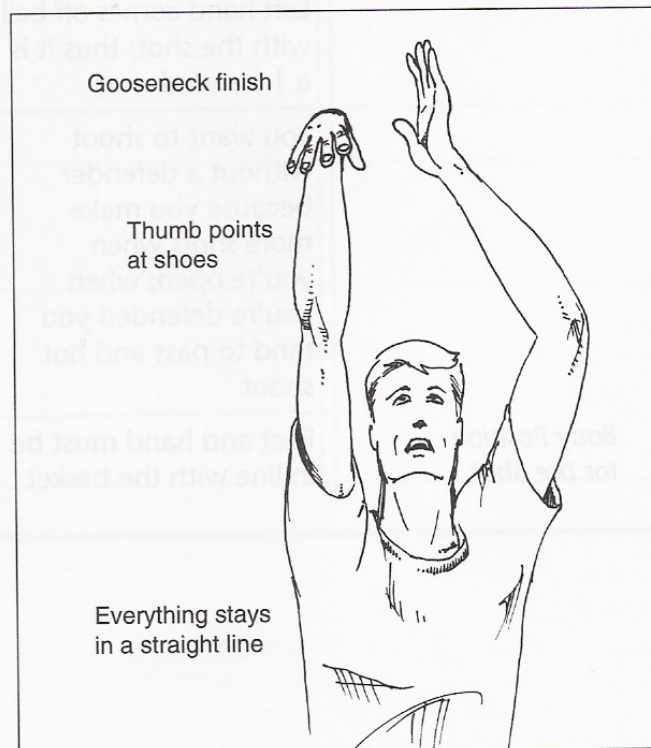


FIGURE 4.2 Forehand Overhead Clear

Cue Teaching in Basketball



(a) Side View



(b) Front View

FIGURE 6.3 Set Shot—Finish Position

Cue Teaching in Softball

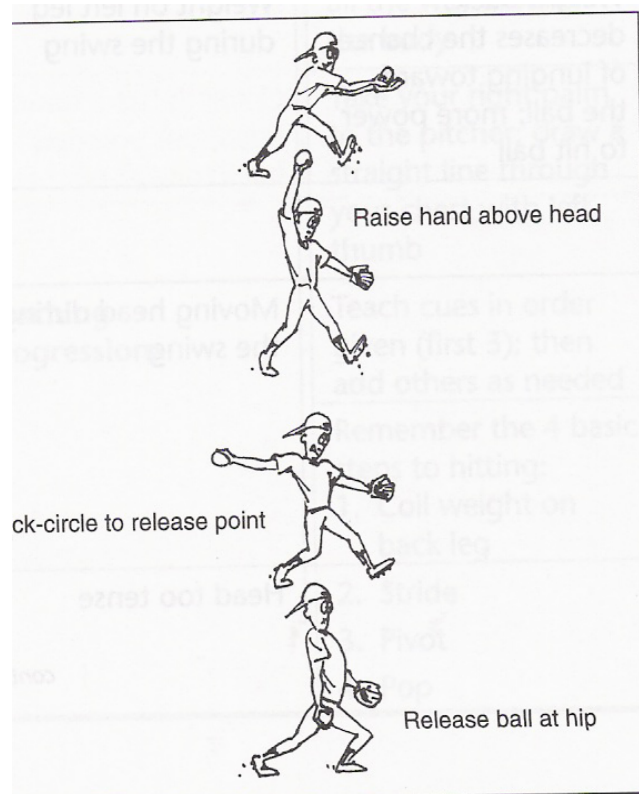


FIGURE 20.3 Arm Swing for Windmill Pitch

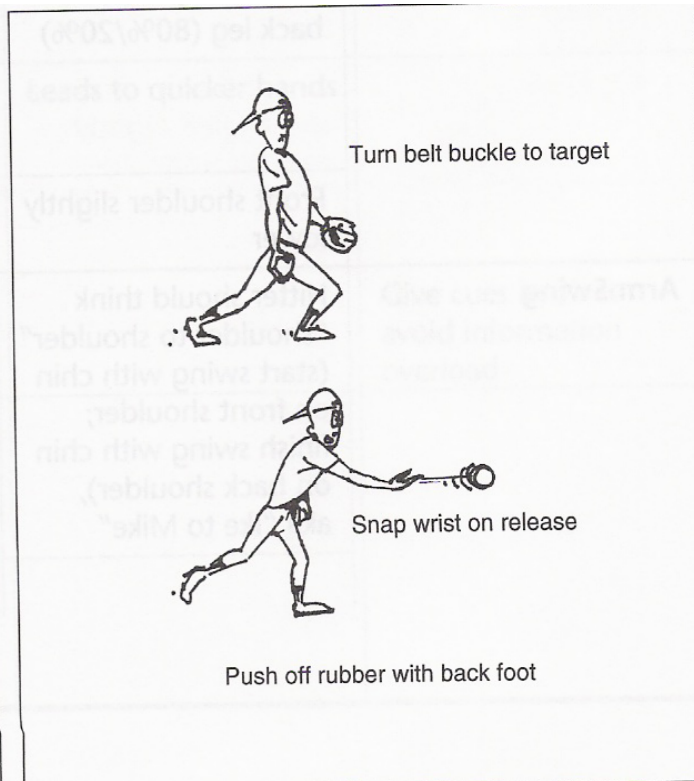


FIGURE 20.4 Release for Windmill Pitch

Implementing Verbal Cues

- Give verbal cues along with a demonstration to enhance visual information
- Cues should direct the learners focus of attention to the movement outcome rather than the movement themselves.
- Use verbal cues while performing to perform key aspects of skills
- Verbal cues should initially be spoken by the performer.
- Cues should be used as prompts.
- Cues needs to be limited in number to only the critical elements of performing the skill.

Verbal Instruction Summary

- Keep verbal instructions to a minimum
- Verbal instructions should direct one's attention to regulatory conditions required to achieve the goal of the movement.
- Verbal instructions should direct the clients to external cues that relate to the movement.
- Verbal instructions biases one's strategies to achieve the goal.
- Verbal cues should be used in the demo, when performing so they focus on critical parts of the skill.