TRANSFER OF LEARNING
Transfer of Learning from one performance situation to another is an integral part of skill learning and performance.
INTRODUCTION

Transfer of learning is one of the most universally applied principles in practicing or learning a motor or sport skill.
WHAT IS TRANSFER OF LEARNING?

Influence of *previous experience* on performing a skill in a new context or on learning a new skill
Two Approaches to Study Transfer

The more shared the elements of two tasks and the more structural similarity of training, the more transfer. (identical elements theory).

Study transfer as function of the similarity of goals and cognitive processing between training and transfer tasks. (transfer-appropriate processing- TAP)
TAP Approach

*TAP = Specificity of practice + similar processes*

To achieve optimal performance, one should experience practice conditions that match test conditions as closely as possible (specificity of practice) and are the goals and cognitive processing between practice and transfer skills similar.
Why doesn’t practice range performance transfer to the actual game of golf?

- PGA golf pros realized that practice range to playing golf on golf courses did not transfer.
- Traditional training involved:
  - Feedback given frequently during practice
  - Hit the ball repeatedly the same distance
  - Did not rehearse pre-shot routine
  - Noncompetitive situation
- Answer to the problem was:
  - Practice all golf technique and cognitive skills during playing a round of golf (e.g. practice with different clubs)
  - Instruction & practice of golf skills should take place in a play or situational context.
  - Less feedback
Practical Implication of TAP

Older adults with balance problem across a 2 month rehab training program performed a wide variety of dynamic balance task that required various types of processing, that is, balance activities in a seated and standing position involving real life tasks and specialize training training equipment. The training program significantly improved balance.  
(Rose & Clark, 1995)
Practical Implication of TAP

Linebacker’s problem was responding quickly enough in the game but was selecting the incorrect defensive response to execute.

Practice was designed to develop cognitive processes for selecting correct defensive response as quickly as possible.
-40 offensive play were video displayed, the linebacker responded as quickly and accurately as possible to the cues.
-Linebacker trained 4 days per week for 4 weeks.

Linebacker’s performance improved because training involve the goals, cognitive processing, and training necessary in selecting the correct responses.

(Christina, Barresi, & Shaffner (1990)
Identical Element Approach
Direction and Amount of Transfer

Direction of transfer can be:
- positive
- negative
- none (zero)

Amount of transfer refers to amount or magnitude of transfer
- highly positive ........ Lowly positive
- highly negative ........ Lowly negative
In comparing two movements, situations, drills, and activities the following identical element transfer principles apply:

1. Stimuli same & responses same = High Positive Transfer
2. Stimuli different & responses same = Slight + Transfer
3. Stimuli same & responses different = Negative Transfer
4. Stimuli different & responses different = Zero Transfer
Does it or does it not transfer?

Stick handling in floor hockey played on the gym floor with a plastic puck to ice hockey with a regulation puck, court, & net.
Does it or does it not transfer?

When you shoot two consecutive free throw shots, the transfer from one attempt to another would be?
Does it or does it not transfer?

Learning the forehand tennis ground stroke by having children strike a tennis ball off a tee with a tennis racquet to how it is performed in the game:
Does it or does it not transfer?

Retraining one to walk in physical therapy by having the client attached to body weight supported harness system that controls the amount of body weight during walking on a treadmill.
Does it or does it not transfer?

Learning how to drive on the right side of the road in the USA then driving on the left side of the road in England?
IN REVIEW (TAP & IDENTICAL ELEMENTS)

Cadaver Versus Computer dissection (virtual reality experience)
Some med school were training surgical students by dissection of a cadaver or using virtual reality software.

Do you think this method of training of medical student, who did not experience cadavers but only experienced software, were good in surgery?
Intra-transfer

1. Passing Drills
2. Shooting
3. Fast Break Drill
4. Free throws
5. Defensive Drills
6. Scrimmage

INTRA-TRANSFER

1. Passing
2. Passing & Shooting
3. Passing + Shooting + Fastbreak
4. P + S + Fastbreak + Free throws
5. P + S + Fastbreak + Free + Defense
6. Scrimmage

INTRA-TRANSFER
Inter practice Transfer

DAY 1: BASIC SKILLS (Passing, shooting, etc)

DAY 2: TACTICAL SKILLS (STRATEGIES)

DAY 3: TECHNICAL SKILLS (BASIC SKILLS + STRATEGIES)

DAY 4: IMPLEMENTATION (GAMES-LIKE)

DAY 5: REVIEW

DAY 6: GAME

INTER-TRANSFER
The basic causes of negative transfer

1. Spatial location and timing between two tasks

2. Memory representation

3. Mental confusion
WHAT CAUSES NEGATIVE TRANSFER?

- The two activities or practice to a real setting involves:
  - Changes in the spatial location of the movement
  - Changes in the timing of the movement

- A person tries to unlearn a way of performing a skill and learn a new way to perform it!
What causes negative transfer?

A specific connection has been made between the perceptual characteristics of skill and the movement. When the skills or situations differ from what is learned it results in negative transfer (memory representation).

Mental confusion is another reason.
Negative Transfer is temporary

It occurs across all stages of learning

Negative transfer causes psychological artifacts

- e.g., the learner experiences failure therefore stops practicing.
BILATERAL TRANSFER

- Transfer of learning relates to learning of the same task but with different limbs

- Important concept about bilateral transfer is the direction of transfer
Does a greater amount of transfer occur when a person learns a skill using one limb before learning it with the other limb?

This is a asymmetric transfer question.
Does a greater amount of transfer occur when one person learns when practicing both limbs?

This is a symmetric transfer question.
Which Direction of bilateral transfer is better?

- Asymmetric!
Does limb dominance or limb preference have an affect?

- Yes!

- The greatest amount of asymmetric bilateral transfer occurs from preferred to the non-preferred limb
TEACHING FOR BILATERAL TRANSFER

- Early in learning...
  - Train the preferred limb
- Once proficiency is achieved...
  - Switch and practice the other limb
- But!!!!
  - Alternate limbs!!
WHY DOES BILATERAL TRANSFER OCCUR?

- The cognitive aspects of the skill is what is transferred (cognitive explanation)

- Transfer of motor control program from practiced limb to other (motor control explanation)
Summary

1. The greatest amount of transfer is based on similarity between the two tasks or two contexts (practice to game or real life activity).
2. Use the transfer rules to identify activities that will promote positive transfer.
3. Spatial and timing changes from prior learned skill to new skill will produce negative transfer.
4. If you confuse the learner, it will produce negative transfer.
5. Realize the negative transfer is temporary.
6. Use the preferred limb first until proficiency is met than alternate limbs.