

# Chapter 2.1

## Skill characteristics and their impact on transfer and practice

### Chapter objectives

- After reading this chapter you should be able to:
  - Gain insight into the characteristics of skilled performance, so that you can understand what makes actions skillful.
  - Help identify the different types of skills.
  - Give practical examples to explain how skills can be transferred from one type to another, including positive, negative, zero and bilateral transfer.
  - Understand how the features and characteristics of skill impact on the way practice is organised and presented.
  - Understand how skill continua and the graphical illustration of those continua can be interpreted by players and coaches so that appropriate types of practice are chosen.

This section introduces the concept of skill, a term closely associated with sports performance, and provides an in-depth look into what constitutes skillful performance. What types of skill are there? A look at how that skill performance can be refined via practice will be examined by linking the types of skill to method of practice or presentation.

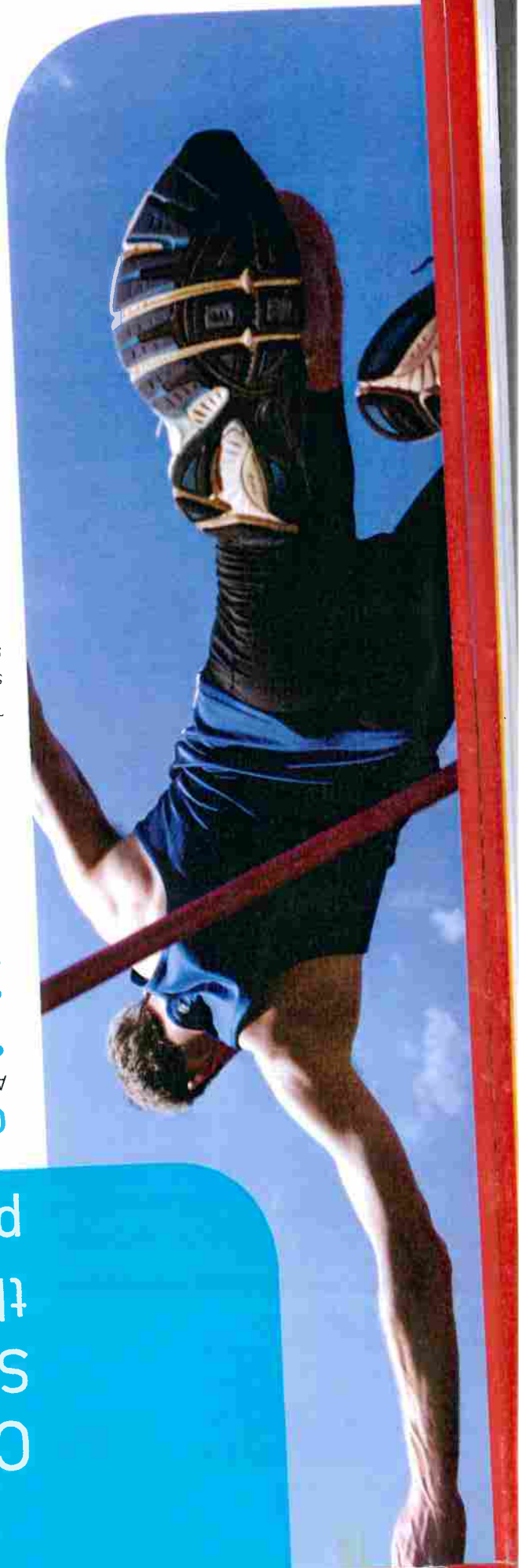
### Characteristics of skill

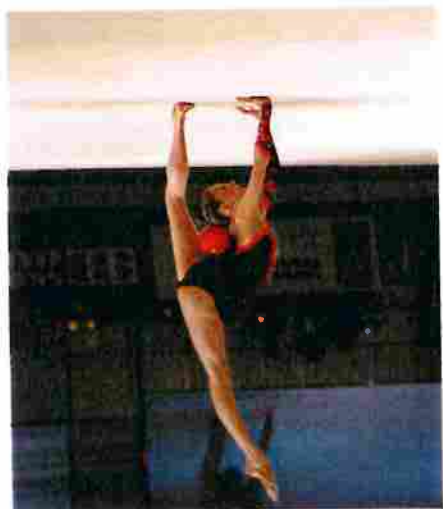
A classic definition of the term **skill** was given by the sports psychologist Barbara Knapp (in 1963) who described skill as 'a learned ability to bring about pre-determined results with the minimum outlay of time, energy or both'. This classic definition incorporates the fact that skill is learned from natural abilities and suggests that there is more to the concept of skill than you might think.

Skill has essential characteristics. When watching a really good performance such as that of an Olympic gymnast performing a floor routine, you might begin to imagine the qualities that would make that performance really good to watch. Those qualities are discussed here.

Such a gymnastic performance does not happen by chance: some work must have gone into it and therefore this leads us to be able to state the quality of a skill – it is **learned**. The essential characteristic which separates skill from ability is that, while abilities are natural, skill has to be developed usually by periods of hard practice!

Skill is also **consistent**. A penalty taker in a team game or a basketball player taking a free throw would be described as skillful if they could ac





**Figure 1** A gymnastic performance shows some of the characteristics of skill

### STUDY HINTS

The last four characteristics of skill have similar meaning. Remember, when you are describing the characteristics of skill, try to make sure that you give four characteristics that differ in their description.

### CHECK YOUR UNDERSTANDING

Skills are learned and efficient. State another three characteristics of skill.

### KEY TERM

**Skill:** The learned ability to bring about predetermined results with the minimum outlay of time, energy or both

### KEY TERM

**Open skill:** A skill performed in an unpredictable environment.

a high percentage rate of success over a number of games. In these two examples, another quality that defines skill is **accuracy**, the penalty taker needs to hit the target in a precise spot to score.

Skilled performance is **controlled**. The diver executing a high dive from the ten-metre board must control their mid-air movements to ensure that when they hit the water, the entry causes minimal splash. Skill is **goal directed** in the sense that it has an aim: the athlete in a hurdles race has the aim of clearing the hurdles and hitting the finish line in the fastest possible time.

Skill is **aesthetically pleasing**, which means that it looks good. Imagine the grace and elegance with which an ice skater performs an ice dance routine to music to illustrate the point. Skill is also **fluent, economical, smooth**

and **efficient**. These four terms imply that a skilled performer, as indicated in Knapp's definition, can execute the task with minimal use of energy while achieving a high level of success. A climber would hope to complete the first phase or pitch of a route without wasting too much energy so that there is enough energy in the tank for the next pitch to be attempted and more chance of a successful conclusion.

### Memory tools

To help you remember the characteristics of skill, the following rhyme or acronym may help you.

The characteristics of skill can be related to the terms **ACE FACE**!

- **A** = aesthetically pleasing
- **C** = consistent
- **E** = efficient
- **F** = fluent
- **A** = accurate
- **C** = controlled
- **E** = economical

### Skill classification: the use of continua

It has already been indicated that skill is developed through practice. In order to make that practice relevant, skill can be classified into various groups so that the correct form of practice can be chosen. The grouping or classifications of skill are based on clearly defined criteria and those criteria are included in a continua which shows the extent to which a skill matches the set criteria. Those criteria are discussed below. It is important to have knowledge of such skill criteria because the coach or player can then realise by how much a skill fits the criteria and so practice can be adjusted. A coach in a team game might deduce that a pass is very open and therefore introduce variety in training to create that unpredictable environment.

### Open and closed skills: environmental influence

The first criterion is based on the influence of the environment.

An **open skill** is performed when the sporting environment is unpredictable and changes frequently. An unpredictable environment simply means all the things that the performer has to think about when playing sport – such as the pitch, the opposition and the position of team mates. This means that the performer must make decisions as the skill is in progress



**Figure 2** A pass in a team game is an example of an open skill

### KEY TERMS

**Closed skill:** A skill performed in predictable environment.

**Gross skill:** A skill that uses large muscle groups.

**Fine skill:** A skill that uses smaller muscle groups.



**Figure 3** Shot put - a closed skill



**Figure 4** Tackle - a gross skill



**Figure 5** Table tennis - a fine skill



**Figure 6** Penalty - self-paced skill



**Figure 7** Sailing - externally paced skill

## Self-paced and externally paced skills: control and rate of execution

The next set of criteria are concerned with the amount of control the performer has over the rate of execution of the skill and the speed with which the skill is performed.

During a **self-paced skill**, the performer controls the speed at which the skill is performed and often has some control over when to start it. When taking a penalty, the player will decide before the penalty is taken how far to strike the ball and when to commence the run up (albeit after the referee has indicated that the penalty can commence).

In an **externally paced skill**, the performer has no control over when to start the skill or how fast it might be performed. In a regatta, the sailor must react to the speed of the wind and the flow of the current

movements of the eyes and of the fingers. can be used for fine motor control such as the muscles used to control needed when attempting to fire a shot in pistol shooting. Small muscles as the control needed to return a shot in table tennis or even the steady hat A **fine skill** is one that uses the smaller, more intricate muscle groups such as quadriceps used in the tackle will have a large number of fibres.

A **gross skill** is one which is performed using large muscle groups such as the shoulder muscles used to initiate a rugby tackle, together with the leg muscles used to drive the opponent to the ground. The large muscles of the

## Gross and fine skills: extent of muscles used

The next set of criteria is based on the extent of the muscle groups used in the action.

The opposite of an open skill is a **closed skill** which is performed in a predictable environment when, rather than **having** to adapt actions during the execution of the skill, the performer can repeat the actions consistently and there are fewer decisions to make. Performing a shot put is a repeated uniform action in which the regulations and conditions of the throwing action are unlikely to change. Such a skill may best be performed by repetition of the same action.

and such a skill might best be practised with variety. An unpredictable environment does not necessarily refer to the weather but can include the changing positions of players on the pitch and the unexpected bounce of a ball.

**KEY TERMS**

**Self-paced skill:** When the performer controls the start and the speed of the skill.

**Externally paced skill:** When the performer has no control over the start and the speed of the skill.

**Discrete skill:** A skill that has a clear beginning and end.

**Serial skill:** A skill that contains several discrete skills in order to make a more integrated movement.

**Low organised skill:** A skill that is easily broken into parts.

when performing a manoeuvre, and has to start the race on the sound of the horn.

**Discrete, continuous and serial skills: continuity**

The next set of criteria are based upon the continuity of the task.

A **discrete skill** has a clear beginning and end and is one short sharp action. An example is a tennis serve – a fast action, after which the player either stops and repeats if the serve does not go 'in' or, on completion of a successful serve, will then move into position to deal with a possible return. Either way, the service action is clearly identified.

A **continuous skill** has no clear beginning and end and often the end of one part or sub-routine of the skill is the start of the next part. A sub-routine is an action that is part of the whole skill movement. Cycling is an example – when the actions of pedalling can be repeated continuously until the task is completed, or in a non-competitive situation can be stopped when the cyclist feels that they need a rest!

There is a third type of skill based on the criteria of this category that uses discrete skills linked together to form a more continuous movement. A **serial skill** is defined as one in which several discrete skills are linked together in a specific order to form a completed task.

Examples of such skills include gymnastic, dance or trampolining routines during which distinct discrete skills such as the seat drop, pike and somersault on the trampoline can be practised individually and then put together to form the completed movement. Each skill is a discrete movement – put it together and you have a serial skill. Another classic example is the triple jump in athletics when the hop, step and jump, discrete skills in their own right, are combined to make up the movement.

**High and low skills: organisation**

Skills can be classified according to how easily they can be broken down into parts, or sub-routines.

A skill that is easily broken down into its sub-routines is called a **low organised skill**. An example is a swimming stroke because the arm action, leg action and body positioning can be easily identified and practised separately if needed.



**Figure 8** Cycling – continuous skill



**Figure 9** Gymnastics – serial skill



**Figure 10** Tennis serve – discrete skill

### KEY TERM

**Highly organised skill:** A skill that is not easily broken into parts.

A highly organised skill is not easily broken down into parts. In the case of a volley in football, the action is very quick and the sub-routines merge quickly as the skill is performed.



**Figure 11** Swimming stroke – low organised skill



**Figure 12** Volley – high organised skill

### KEY TERMS

**Simple skill:** A skill that requires few decisions when being performed.

**Complex skill:** A skill that requires decision making using lots of information when performed.

The final criterion on which skills are classified is the degree of difficulty the skills possess in terms of the amount of information needed to complete the skill. A simple skill needs limited decisions to be processed during its execution and there is not a lot for the performer to think about as the skill is being completed. A forward roll in gymnastics is an example. A complex skill is one in which there may be many decisions to make and an amount of information needed before the performer can attempt the skill. A dribble in hockey is an example since the player has to take into account the position of other players, attackers and defenders, as well as concentrating on the ball and the control of the stick! The player has to think about the cognitive parts of the skill such as the position of opponents, as well as the psychomotor parts – the stick action.



**Figure 13** Forward roll – simple skill



**Figure 14** Hockey dribble – complex s

## Justification of skill placement on each of the continua

Now that the types of skill have been discussed, there is another aspect to the understanding of skill classification – skills can change! A skill classified as one thing can change in different situations and, as the game or performance develops, skills can be classified in different ways. For example, in an isolated practice situation, a basketball dribble, when the players are lined up and practising in turn without opposition, can be classed as a closed skill since the environment is predictable. However, in a practice situation of three vs two or during a game, the same skill now becomes open since the environment is changing and unpredictable. At the start of a swimming race the swimming start may be classed as a discrete skill since it has a clearly defined beginning and end. However, as the actual race gets underway, the swimming stroke can be classed as continuous since it is unclear when one arm action, for example, ends and another arm action begins.



Figure 15 Swimming start – discrete



Figure 16 Swimming race – continuous

### CHECK YOUR UNDERSTANDING

- Classify a sprint start in athletics under the following continua:
- Open – closed
  - Self-paced – externally paced
  - Discrete serial – continuous.

### ACTIVITY

In this section, various examples have been used to explain the different skill classifications. Review each of the classifications that have been discussed and see if you can think of an example of your own to illustrate the criteria for each classification.

### STUDY HINTS

The situation in which the skill is performed should be taken into account when classifying skills since the skill can change in a different environment. The accepted criteria and key points should be used to justify the choice of skill classification rather than merely describing an example of the skill. For example, a basketball free throw is a closed skill because the environment is predictable, not just because a professional court always has the same markings according to laws of the game and the ball must therefore be thrown from the same place each time. Perhaps this last point links back to the start of this chapter – there is a lot more to the concept of skill than you might think! The command word 'justify' means 'give a reason'.

## Transfer of learning

### Types of transfer

#### Positive transfer

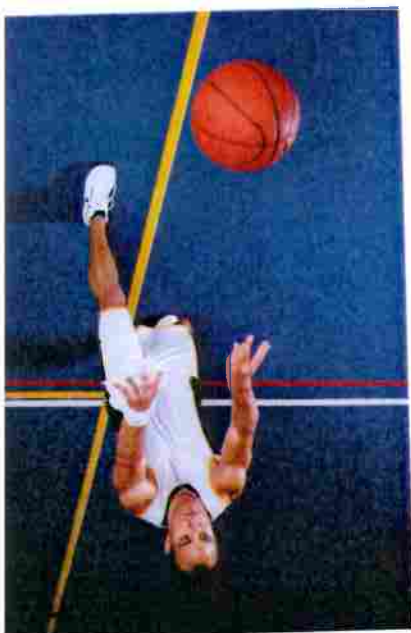
An essential feature of a skill is that it is learned. In this section, we are going to look at how such learned skills can be transferred from one sporting situation to another. The theory of **transfer** is defined as the effect of the learning and performance of one skill on the learning and performance of another, and this transfer effect can happen in a number of ways.

The first type of transfer is called **positive transfer** and this is defined as when the learning of one skill helps or aids the learning of another. Positive transfer tends to happen when two skills have a similar shape and form – the actions of the two skills are similar so that the movements of one skill help the action of the other.

Examples would include the similar arm actions of the overarm volleyball serve and the tennis serve or the similar actions of a basketball pass and a netball pass.



**Figure 17** The netball pass has a similar action to the basketball pass



**Figure 18** Basketball pass

#### Negative transfer

The second type of transfer is not as helpful and is called **negative transfer**. This happens when the action of one skill hinders the learning of another.

Negative transfer happens when there might be some familiarity with the environment in which the two skills are performed and this familiarity may cause confusion when the actions of the two skills are not the same. Badminton and tennis are games played on a court divided by a net, but the action of the tennis serve uses the arm, the wrist action of the badminton serve is different, hence negative transfer.

### CHECK YOUR UNDERSTANDING

- 1 In team sports, skills can be classed as open or closed. Using an example from a team game, explain what is meant by both an open and a closed skill.
- 2 What are the characteristics of skilled performance?

### KEY TERMS

**Transfer:** The effect of the learning and performance of one skill on the learning and performance of another.

**Positive transfer:** When the learning of one skill helps the learning of another.

### STUDY HINTS

Remember if you are defining or explaining the different types of transfer, you should try to use different words from those already contained in the term. In other words, do not explain the term 'positive transfer' by stating that it is when there is a positive effect between skills.

### KEY TERM

**Negative transfer:** When the learning of one skill hinders the learning of another.

As far as a coach is concerned, it is the useful effect of positive transfer that is required since this may help players to acquire a greater range of skills. Positive transfer can be encouraged by making sure that training is realistic, so that the use of cones or rugby tackle bags are replaced by real people in small sided games – a more relevant representation of the game!

## Ensuring positive transfer

Another form of transfer happens, as the name suggests, from one limb to another. **Bilateral transfer** happens when the learning of one skill is transferred across the body, in the way that a right-footed footballer would be encouraged to use the left foot when required, so that the impact of a shot from the left foot becomes equal to the impact of a shot with the right foot.

### Bilateral transfer

**Figure 21** The swimming stroke and climbing have no transfer effect



**Figure 22** Rock climbing



**Zero transfer** is when the learning of one skill has no effect on another since the two skills in question have no similarities and no aspect of confusion. The swimming arm action and the foot placement in rock climbing having nothing in common and therefore there is no transfer affect between them.

### Zero transfer

**Figures 19 & 20** The tennis serve may have a negative effect on the badminton serve



### STUDY HINT

Negative transfer is sometimes confused with zero transfer – an effect that is really not transfer at all because nothing happens – not positive, not negative, nothing!

**Zero transfer:** When the learning of one skill has no impact on the learning of another.

### KEY TERM

**Figure 23** The actions of a shot in football can be transferred from right foot to left foot



**Bilateral transfer:** When the learning of one skill is passed across the body from limb to limb.

### KEY TERM

## The impact of skills classification on the structure of practice for learning

The coach should make sure that one skill is well learned before moving on to a more advanced skill so that the players experience slow, planned progression and during such progress, the coach could reward and reinforce the players for the correct adaptation of positive transfer by praising players for using skills with similar actions.

Having discussed the different types of skills and classified those skills according to various criteria, it is also important to discuss how knowledge of skill type can help both coach and player pick the right form of practice so that the most beneficial effect can be found when skills are used in the game or event.

When criteria are used to define an open skill such as a pass, the environment is unpredictable and changing. Therefore practice should be varied to account for the changes the player might encounter in the game. Skill classification should determine the best type of practice to use and the coach should consider the type of skill before deciding how to practise it. The types of practice and the ways to present the skill to the learner are discussed below.

### Methods of presenting practice

Skills can be presented as a whole or by breaking them down into sub-routines. The decision on which type of practice to use depends on the type of skill, the performer and the advantages that can be gained.

### Whole practice

**Whole-practice** methods involve performing the skill in its entirety without breaking it into sub-routines. This is the ideal way to teach a skill because it promotes understanding, establishes the links between sub-routines and creates fluency. The coach might decide to use whole practice when:

- The skill is fast, ballistic and discrete such as the sharp action of a tennis serve.
- The skill is highly organised and cannot easily be broken down into sub-routines.
- The skill is simple and does not require much thought so that fewer demands are placed on the performer.
- The feel (*kinæsthesis*) of the whole task is required as the learner develops and is ready to perform the whole task.
- The performer is advanced in the autonomous stage of learning, when movement is detailed and precise, and able to cope with the demands of the whole task.
- The links between sub-routines need to be maintained or the skill needs to be performed in a specific order, such as in a trampoline routine.

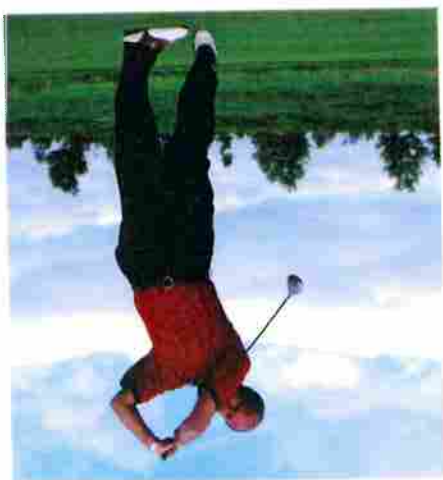
Examples of the use of whole practice therefore include a golf swing performed by an experienced player because it is discrete, fast and quick and hard to break down into its parts. The coach would especially use whole practice with an expert since they can cope with the demands of the task and may just need fine tuning!

### KEY TERM

**Whole practice:** Practising the skill in its entirety.

### CHECK YOUR UNDERSTANDING

- 1 Explain what you understand by the term positive transfer and give an example of two skills that might promote positive transfer when performed in practice
- 2 Consider the skills of a throw in the game of rounders and a javelin throw. What type of transfer do you think could take place between these two skills? Can you explain your choice?



**Figure 24** A golf swing is a ballistic skill that is best practised using the whole method

**CHECK YOUR UNDERSTANDING**  
Name three advantages of using whole practice

**KEY TERM**  
**Whole-part-whole practice:** Assessing the skill, identifying a weakness to practise, then putting the skill back together.



**Figure 25** When practising a volleyball smash, a weakness could be rectified by whole-part-whole practice

### Advantages of whole practice

- The advantages of using whole practice are that it gives a feel for the whole skill and the links between each sub-routine are maintained, as in the golf example when the hip movements lead to a controlled arm action. The performance may therefore be more fluent, and by using whole practice, it may take only a short amount of time to perfect the performance.
- Whole practice helps to create specific images that can be stored as a plan called a motor programme which is stored in the long-term memory and contains a mental image of all the parts of the skill. This is useful when the skill needs to be recalled from memory and performed.
- Whole practice is more realistic than part practice so it helps to produce the effect of positive transfer between skills learned in training and those same skills performed on the pitch.
- Whole practice helps to make the skill consistent – a major characteristic of skilled performance – and it will help the performer to keep good habits and be able to perform skills almost automatically.

### Disadvantages of whole practice

Whole practice can, however, have some disadvantages. It may place unnecessary demands on the performer who may not be able to cope with all the aspects of the skill at once, especially if they are a beginner. There could be a possibility of fatigue if the performer tries to do the whole task without a break and there may be too much information for the performer to process.

There is a solution to the problems associated with whole practice when the coach or player may have a specific weakness to work on or the task might be difficult to break down and is being attempted by a novice. The coach may attempt whole-part-whole practice.

### Whole-part-whole practice

With whole-part-whole practice the performer has an attempt at the whole skill to get an initial feel for the movement. Then each part of the task is practised individually or specific weaknesses are highlighted, practised separately and then put back into the whole skill. An example is a fairly experienced volleyball player who has a problem with the spike: the whole action can be looked at and then a specific issue with the arm action is identified and corrected.

The whole-part-whole method is used when a beginner is doing a complex task and may need to concentrate on one part of the skill to get this part right before making progress. This is important when the skill is hard to break down or it has high organisation so that the coach concentrates on one aspect of the skill at a time. Since the skill is not broken up, then the links between the sub-routines are maintained. The coach could even highlight a specific weakness, isolate this weakness and then correct it.

### Advantages of whole-part-whole practice

The advantages of whole-part-whole practice are that it can provide motivation when success is achieved when a long-standing weakness is corrected; it provides immediate feedback (see section on feedback in Chapter 2.2); and therefore corrects errors and allows the selected part

**CHECK YOUR UNDERSTANDING**  
What are the advantages of using the whole-part-whole method of practice?

### KEY TERMS

**Progressive part practice:** Practising the first part of the skill then adding parts gradually. Sometimes called chaining.

**Chaining:** Linking the sub-routines, or parts of a task, together in order when practising. The first two parts are learned, then the third part is added; that part is learned and added to the first two, and so on.

### Progressive part practice

**Progressive part practice** is sometimes called **chaining**. The first part of the skill is taught and then the rest of the parts are added in sequence. This method of practice is used for serial skills when the order is important and when the links between sub-routines need to be made. It might also be used for dangerous skills such as learning a routine on a trampoline. For example, a dance routine could be developed by teaching each part of the sequence in order. The first part of the routine is taught first and the second part is added on, and so on, until the sequence is complete.



**Figure 26** A dance routine can be broken down into a sequence and can be practised in progressive parts

The progressive part methods of practice are useful when the skill is low-organised and can be broken down so that each part is clear. Progressive part practice can be used when the skill is serial so chaining can occur and each part can be gradually added until the skill is complete. A complex skill could benefit from the use of part practice since one complex feature of the skill can be isolated, taking pressure off the performer.

### Disadvantages of whole-part-whole practice

The problem with whole-part-whole practice is that it may produce negative transfer effects unless the coach integrates the part back into the whole during the same training session. Once the part is isolated, the coach should link it back into the whole action as soon as the part has been rectified so that the correct whole action can be learned when the corrections are fresh in the mind. The process of whole-part-whole practice is more time consuming than just doing the whole thing.

Sometimes it is necessary to break the task down into parts as you practise. Although practising each component of the task is a longer process, it can be worth the patience and perseverance.

One method of breaking the skill into parts is called **progressive part practice**.

to be integrated successfully into the whole action, therefore improving performance and correcting errors. Fluency and integration of the sub-routines can be maintained while errors are corrected – a double bonus! This method maintains the feel for the whole skill and the transition between each part of it.

## Advantages of progressive part practice

The advantages of part practice are that the learner is allowed to focus on one aspect of the task and can potentially correct specific weaknesses. The learner can rest so fatigue is reduced. If the performer is low on motivation, each part brings success in stages so that the motivation levels are restored. Progressive practice builds an initial understanding and it may improve the confidence of the performer as success is gradually achieved. Progressive practice allows both coach and player to focus on specific issues or key aspects of the task.

## Disadvantages of progressive part practice

The disadvantages of part practice are that it can be time-consuming, it might neglect the feel of the whole task and it might ignore the links between sub-routines. As with whole-part-whole practice, there could be a danger of negative transfer between each sequence of the skill so the coach should ensure that the first part of the task is learned well before attempting to make further progress. In the discussion above of whole and part practice, it was suggested that the performer may need a break when trying to practise a continuous skill. Indeed the coach may take into account the needs of the performer and the type of skill being practised to decide whether to complete the session without a break or to give the players a rest.

## Types of practice

## Massed practice

**Massed practice** is continuous, with no rest between sessions. It is used when the skill is discrete, simple and the environment is closed. This means that there are unlikely to be many changes needed to the skill and numerous repetitions can be undertaken.

## Advantages of massed practice

The advantages of using massed practice are that it promotes fitness so that the performer can cope with the extended demands of the task. Practising without a break makes the skill become almost automatic so fixed responses become habitual and the player can repeat the skill consistently. Motor programmes – those images stored in the memory – can be stored more easily so that they can be recalled in the future. Massed practice is an efficient use of coach and player time – it gets the job done quickly!

## Disadvantages of massed practice

The disadvantages of massed practice are that it can produce fatigue, especially if the performer lacks fitness, and again there is a danger of negative transfer unless the coach makes the practice conditions similar to the real game. The demands on the player are high in this form of practice so the coach should make sure the practice is kept simple and the player has the motivation to keep repeating the drills!

## Distributed practice

**Distributed practice** involves rest intervals between sessions. It should be used when the skill is continuous and the performer may need a break. It could be used when the skill practice is changed because the skill is open and unpredictable and the break is used to explain the changes or additions to the

## KEY TERM

**Distributed practice:** Rest intervals.

## KEY TERM

**Massed practice:** No rest intervals.

## CHECK YOUR UNDERSTANDING

When would you use progressive part practice?

**KEY TERM**  
**Mental practice:** Going over the skill in the mind without movement.

### Advantages of distributed practice

practice drill. During practice of a complex or externally paced skill, the coach might use a break to relieve the pressure and intensity from the players.

The advantages of using distributed practice are that it takes the pressure off the performer and allows some recuperation after a tough session of practice and the possible onset of fatigue.

Distributed practice is good for beginners since it allows controlled progress to be made at the pace of the performer and feedback or coaching advice can be offered to the performer during the rest interval. The performer could use **mental practice** during the break in practice. Mental practice is when the player goes through the key points of the skill in their mind without actual movement.

Distributed practice may offer some motivation to the performer when praise is given by the coach during the rest interval and success in a part of the skill provides intrinsic motivation. Distributed practice offers a safe way of practising more dangerous activities, when clear guidelines can be given to avoid the dangerous aspects of the task.

### Disadvantages of distributed practice

The disadvantages of distributed practice are that it is time consuming and should not be used when the training session is tight and requires fast progress. It may not, therefore, be useful for expert players who wish to over-learn their skills. Again, there is a danger of negative transfer that could happen after the rest interval if the coach fails to integrate the practice session as a break as

Distributed practice may be used when the players are offered a break as the type and content of the training session is changed. Indeed, changing the skills and drills and changing the type of practice used is known as **varied practice**.

### Varied practice

It is often appropriate during training for team sports to change the drills and the type of practice so that the players learn to adapt to changes in the environment. For instance, the coach may use massed practice with a fixed drill to practise shooting without opposition; the coach may then switch to more progressive practice and use some 3 vs 2 drills.

Varied practice should be used when the skill is open and the environment is unpredictable. This means that there are likely to be changes in the sporting environment when the skill is performed, so the practice session should replicate these conditions. An externally paced skill may mean that the performer has to adapt to changes in the environment, so again varied practice should be used to practise such skills. During a continuous skill, the player may need a little variety to maintain motivation.

### Advantages of varied practice

The advantages of varied practice are that it allows the players to adapt the skills to changing environments and is very appropriate for open skills. The variety of practice prevents the players from becoming stale and may add little fun and games to the practice session, increasing the motivation of the players. Varied practice helps to build the sub-routines or parts of the skill and it also helps to develop a method of adapting existing skills from the memory store, called a 'schema'.



**Figure 27** A team training drill uses the principles of varied practice

**CHECK YOUR UNDERSTANDING**  
 What is the difference between massed practice and distributed practice?

### KEY TERM

**Varied practice:** Changing the practice type and the practice drills.

### Disadvantages of varied practice

The disadvantages of varied practice are the familiar ones of it being more time consuming and it increasing the risk of negative transfer unless the changing drills are integrated into the aims of the practice session. An additional problem of varied practice is that it might place unnecessary demands on the players if they are given too many things to focus on and there is also therefore a danger of fatigue.

### Mental practice

The process of **mental practice** is an increasingly popular technique which is used in addition to physical practice to aid performance. The athlete goes through the performance in the mind without movement, either just before a major event or as part of a training programme between periods of practice. Mental practice has the greatest results when it is combined with physical practice. Players may use mental practice as part of the warm-up to provide preparation for the task ahead. A games player may mentally rehearse a move or a set play before the kick off.

### The benefits of mental practice

The benefits of mental practice are that it improves confidence and lowers anxiety. There is evidence to suggest that mental practice actually stimulates the muscle receptors so that the player is better prepared and reaction times are increased. Mental practice develops cognitive ability and improves the decision making and thinking of the player. A real bonus of mental practice is that it can be done when the player is injured, helping to maintain the memory of the skill.

Mental practice can be external or internal. External mental practice involves forming an image of yourself performing the skill, as if you were on television, i.e. looking at yourself from the outside. Internal mental practice looks at performance from within, i.e. imagining what it feels like to perform the skill and looking at how your anxieties and mental control of the skill can be improved.

### Coaching mental practice

Mental practice is so useful that many sports coaches include it in their training. Approaches depend on the degree of experience of the performers. For beginners, coaches might include mental practice in the training programme as part of distributed practice. They would concentrate on the basics of the skill and introduce more advanced topics by making sure the first part is learned mentally before they progress. For example, they would go over the grip of the ball mentally with the players before they progress to the actual pass.

- For beginners, the mental practice should be short and the key parts of the task should be emphasised. The particular benefits of mental practice should be to lower arousal and anxiety, to build confidence, to provide a basic picture of the requirements of the skill, to reduce errors and to provide motivation.

- With expert performers, the techniques of mental practice should be established so that coaches can devote a whole session to preparing for a major game. Specific tactics or strategies could be highlighted, perhaps focusing on an opponent's weakness, and the performers could then be allowed to control the session.

### CHECK YOUR UNDERSTANDING

For what type of skills would you use varied practice?

| Type of presentation                                                                                    | When to use                                                                                                                     | Advantages                                                                                                                               | Disadvantages                                                                      | Example                                       |
|---------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-----------------------------------------------|
| <b>Whole</b><br>Skill in its entirety,<br>sub-routines intact                                           | <b>When skill is:</b><br>Fast<br>Closed<br>Discrete<br>Self-paced<br>Simple<br>High organised                                   | Fluency – feel of the skill<br>Develops kinæsthesia or understanding<br>Keeps links between sub-routines                                 | Too much information<br>Beyond the capabilities of performer<br>Not for beginners  | Tennis serve                                  |
| <b>Whole-part-whole</b><br>Do whole task<br>Isolate weakness<br>Work on it, put it back into whole task | <b>When skill is:</b><br>Complex<br>Fast/ballistic<br>Difficult to isolate parts of skill yet performer has a specific weakness | Shows weakness<br>Corrects it                                                                                                            | Time consuming<br>Some skills cannot be broken down                                | Golf swing when the performer has a poor grip |
| <b>Progressive parts</b><br>Each part of the skill is added, gradually chaining                         | <b>When skill is:</b><br>Complex<br>Serial<br>Externally paced<br>Low organised                                                 | Keeps links between parts<br>Stages of success gives motivation, reduces danger, reduces fatigue, reduces demands<br>Focus on weaknesses | Time consuming<br>If the first part is incorrect, all is lost<br>Negative transfer | A dance routine                               |

Table 1 Table to summarise types of presentation

**STUDY HINTS**

The key to answering a question that asks you to link a type of practice to a skill classification is to classify the skill first and then explain why a particular type of practice should be used to learn it.

To help you, Table 1 below shows the methods of presentation and the types of skills they should be used for, while Table 2 shows the methods of practice and the types of skills they should be used for.

### ACTIVITY

Having discussed the different types of practice, pick a skill from a sport of your choice and attempt to classify that skill according to the criteria highlighted earlier in this chapter. Having classified your skill, now suggest the types of practice you might use to learn your chosen skill. Give reasons for your choices.

### CHECK YOUR UNDERSTANDING

What are the advantages of using mental practice?

- For advanced performers, it is important to develop mental practice because it can give that extra edge by improving reaction time, activating the muscles, helping the performer to focus, and making sure the performer remains in the autonomous phase of learning, with automatic responses.
- When mental practice is being undertaken, coaches should try to ensure that it gives maximum benefit to the performer by making sure it is done in a relaxed environment and that successful results are always the ones that are rehearsed. Mental practice can be done in conjunction with physical practice and this combination usually gives the best results.

## SUMMARY

In this chapter, the way sports skills can be classified according to various criteria have been studied and the link between the type of skill and the best method of presentation and practice to use has been established. These criteria include the influence of the environment, the use of muscles, pacing, continuity, degree of difficulty and the organisation of the task.

The methods of presentation and practice from which to choose were discussed as follows.

## Methods of presentation

- Whole practice: when the skill is performed in its entirety.
- Whole-part-whole practice: when the complete task is performed and then one aspect is isolated and practised so that it can be returned into the whole task with better technique.
- Progressive part practice: when the skill is broken down into its sub-routines and practised in sequence.



Table 2 Table to summarise types of practice

| Type of practice                                                                                | When to use                                                                                                                                                                                                                                                                    | Advantages                                                                                                        | Disadvantages                                                                       | Example                                                                             |
|-------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| <b>Massed practice</b><br>No rest intervals                                                     | Discrete<br>Simple<br>Closed<br>Highly organised<br>Self-paced                                                                                                                                                                                                                 | Forms motor programmes<br>Increases fitness<br>Enhances over learning<br>Good for habitual responses<br>Efficient | No time for<br>feedback<br>Fatigue<br>Too demanding                                 | Basketball<br>player<br>practising a<br>free throw                                  |
| <b>Distributed practice</b><br>Rest intervals<br>between sessions                               | When skill is:<br>Continuous<br>Complex<br>Low organised, can<br>break it down<br>Serial<br>Externally paced                                                                                                                                                                   | Allows recovery<br>Less mental pressure<br>Allows, mental rehearsal/<br>feedback<br>Reduces danger                | Time consuming<br>Negative transfer                                                 | A swimmer<br>practising<br>stroke<br>technique in<br>training                       |
| <b>Varied practice</b><br>Changing the<br>skills and drills<br>Changing the type<br>of practice | When skill is:<br>Complex, easy part at<br>first then add<br>Open<br>Externally paced                                                                                                                                                                                          | Builds a <b>schema</b><br>Gives motivation<br>Allows adaptation                                                   | Time consuming<br>Possibility of a<br>negative transfer<br>Fatigue<br>Too demanding | Players<br>practising a<br>football pass                                            |
| <b>Mental practice</b><br>Go over it in the<br>mind without<br>movement                         | When skill is:<br>Serial, complex<br>Used by both novice and<br>expert<br>Novice: basics in parts,<br>usually during rest in<br>distributed practice<br>Expert: whole task, do it for<br>real<br>Two ways:<br>Internal: emotions<br>External: mental picture of<br>environment | Improves reaction time<br>Builds motor programmes<br>Builds confidence<br>Controls anxiety                        | Must be correct<br>Environment must<br>be calm                                      | A performer on<br>the trampoline<br>going over the<br>routine before<br>competition |

## PRACTICE QUESTIONS

1 The skill of a free throw in basketball is an example of a skill that can be classified as:

a) open, externally paced and discrete

b) closed, self-paced and discrete

c) open, self-paced and discrete

d) closed, externally paced and continuous.

2 What do you understand by the term 'transfer of learning'? Explain the forms that transfer can take.

3 The sport of athletics is a major feature of the Olympic Games. State a skill in athletics that you think is closed, a skill that you think is serial and a skill that you think is gross.

Give reasons for your choices.

4 Swimming may be taught using either the whole method or part method. What are the advantages of using the whole method and the part method?

## Types of practice

- Massed practice: when the skill is undertaken without a break.
- Distributed practice: when a rest interval is taken during the practice session.
- Varied practice: when different types of practice and different drills are used.
- Mental practice: when the performer goes through the performance in the mind without movement.
- The influence of skills transfer, when the learning of one skill affects the learning of another, was discussed in terms of how transfer affects performance in a positive, negative, bilateral way or not at all, if the transfer is zero.
- The type of transfer useful to a coach is positive transfer and this can be achieved by making training realistic, pointing out the transfer possibilities, giving praise for successful transfer and making slow, planned progress. Examples of the links a coach may make between the skill classification and the best type of presentation or practice to use are:
- When the skill is simple and discrete, the skill might be practised as a whole without too much demand on the performer, or the coach might use massed practice to groove the performance, such as the cricketer practising a cover drive.
- A complex skill or a skill performed as part of a routine might be coached using progressive part practice, such as in a gymnastics routine
- If the coach spots a specific weakness such as the incorrect grip on a tennis racket, the coach might use whole-part-whole practice.
- When the skill is continuous, the coach might allow a break in practice to aid recovery.
- When the skill is open, the coach may create an unpredictable environment using varied practice.
- Mental practice can be used before a major competition to calm any nerves.

(5 ma

(3 ma

(3 ma

(1 ma