

COACHES' METHODS AND ATHLETE/PLAYER LEARNING

I was working on one athlete and saying 'Move your hands away, move your hands away', thinking of the technique I was trying to get and then I realised, okay, this is Ana. Why isn't Ana moving her hands properly? Maybe she doesn't understand what I'm saying or I'm saying it the wrong way, so I changed something or did it another way or whatever, but it immediately brought my focus onto the person and now I was dealing with Ana and Simona and Maria, rather than just a group of athletes to whom I was teaching a technique. And it just kind of struck me then 'Ah, this is the way you go about it. This makes it much more interesting!'

The above quote from Chapter 1 presents the thinking of a neophyte rowing coach who had started to consider how her approach could better influence the learning (and performances) of her young athletes. In doing so, she begins to hint at the messiness of how an athlete/player learns, how a coach teaches, what is being taught and the context in which learning occurs. To better understand the process of knowledge production that occurs in the interactions between the coach, the athlete/player, and the sporting content and context, scholars have drawn upon the sub-discipline of pedagogy. The term 'pedagogy' usually refers to children as learners, however, within the literature the term is also used in the context of adults, although the more appropriate term is 'androgogy' (Armour, 2011).

Learning has been, and continues to be, a topical area within sports coaching. Certainly, coaches are influential in shaping the learning and development of athletes/players. In work focusing on sport coaches and athlete/player learning, three theories are often discussed: behaviourism, cognitivism and constructivism. While these theories are in agreement that learning involves 'acquiring and modifying knowledge, skills, strategies, beliefs, attitudes and behaviours' (Schunk, 2014, p. 2), they differ in how it occurs. Therefore, this chapter begins with a discussion of these three theories, highlighting their differences. The second half of the chapter focuses on the connection between athlete/player learning and popular methods that coaches use: directive/command, task, reciprocal, guided discovery and problem solving.

BEHAVIOURISM

Behaviourism has its roots in late nineteenth/early twentieth century psychology with John Watson generally considered to be the founder. However, Ivan Pavlov, Edward Thorndike and B.F. Skinner were involved in key developments within this area (Rachlin, 1991). Behaviourism has significantly influenced the content and delivery of education in the western world. The hallmark of behaviourist theories is that they focus on behaviour, explaining learning in terms of environmental events (Schunk, 2014) – that is, we learn through a process of stimulus-response and selective reinforcement. This means that all behaviour can be explained without consideration of what is happening within the learner's brain during learning (Chambers, 2011).

John Watson (1878–1958) was an American psychologist, who, with his graduate student Rosalie Rayner, developed an experiment entitled, 'Albert B'. The purpose of the experiment was to identify if classical conditioning (famously used by Pavlov with dogs) could be used to condition an emotional response in humans. Watson and Rayner exposed nine-month-old boy, Albert, to a series of neutral stimulus (i.e. a rat, rabbit, monkey, masks and burning newspapers), to which Albert had no reaction. Because the stimulus was neutral (resulted in no reaction), the researchers could use one of the items to test if they could condition a response. For example, when they introduced a hite rat to Albert they made a loud noise caused by

hitting a hammer against a metal pipe. Albert was disturbed by this loud noise (unconditioned response), and upon hearing it began to cry. Each time the rat was introduced to Albert, the noise occurred. After repeatedly pairing the rat (conditioned stimulus) and the noise (unconditioned stimulus), Albert associated the rat with fear (conditioned response) (Huber, 2013).

In relating this example to coaching, consider an athlete who decides to try a new sport. Before conditioning, the lack of experience and knowledge of the new sport meant that the sport itself did not elicit a response (neutral stimulus). However, during the first week of training, the athlete witnesses the coach shouting at the other athletes and punishing them for making mistakes. The new athlete finds the coach's behaviours (negative unconditioned stimuli) upsetting. Consequently, she develops a hatred for the new sport (negative conditioned response) and does not want to continue participating.

Watson's work in classical conditioning led to the belief that the learner is a passive recipient of knowledge. However, Thorndike and Skinner did not agree with this view of learning and positioned the learner as more active. As discussed in the subsequent paragraph, in contrast to classical conditioning, operant conditioning suggests that behaviour is shaped or maintained by its consequences.

Edward Thorndike (1874–1949) was a prominent American psychologist who proposed that learning involves forming associations or connections between sensory experiences (perceptions of stimuli/events) and neutral impulses or responses that are demonstrated behaviourally (Schunk, 2014). Such an approach to learning is based upon trial and error (i.e. selecting and connecting). For example, one of Thorndike's most known works was the puzzle box experiment in which a cat was placed into a cage, with food placed outside of it. The cat would randomly try different ways to escape the box to get the food and, eventually, after moving around the box, would stumble upon the lever that opened the hatch. Over several trials, the cat made fewer errors to find the lever and was faster at escaping from the box. This suggested the cat had learned that there were favourable consequences to pressing the lever; thereby it adopted the behaviour. Focusing on the relationship between the cat's behaviour and its consequences, Thorndike proposed the law of effect. This is explained in the following way:

If a stimulus that follows a response makes that response become more likely, we say that the response was reinforced. If the stimulus makes the response become less likely, we say that it is punished. (Carlson & Buskist, 1997, p. 145)

In addition to the law of effect, Thorndike also identified the law of exercise. This referred to the *law of use*, in which a response to a stimulus strengthens the connection and the *law of disuse*, in which a response is not made to a stimulus. Consequently, the connection is weakened or forgotten (Schunk, 2014). Further work by Thorndike identified that rewards strengthened the connections, but punishment did not weaken them (Thorndike, 1932). Rather, connections were weakened when alternative connections were strengthened. This is interesting because the work identified that punishment may suppress a response, but it only provides feedback on what not to do (i.e. it does not offer information on the correct behaviour). Therefore, when athletes are told that they are doing something incorrectly, they understand what *not to do*. However, if an athlete does something incorrectly, but is also given corrective feedback and an opportunity to practise solving problems correctly, they learn the appropriate method (although they do not forget the incorrect method) (Huber, 2013).

B.F. Skinner (1904–1990) was an American psychologist who built upon Thorndike's work. Skinner was interested in how positive reinforcement worked. To do this, Skinner placed a hungry rat in a 'Skinner box'. The box contained a lever on one side and, as the rat moved about the box, it would accidentally knock the lever. In doing so, a food pellet would be released into a container. After a few trials, when the rat was put into the box, it would go directly to the lever. Skinner explained that the positive consequence of receiving food ensured the rat would repeat the action each time it was put into the box. While Skinner demonstrated how rewards can increase behaviour, he also showed the impact of negative reinforcement. Similar to the initial experiment, Skinner placed a rat in the Skinner box and, instead of providing a reward, he subjected it to an unpleasant electric current. As the rat moved about the box, it would knock the lever that switched off the electric current. The rat quickly 'learned' to go straight to the lever to shut

off the unpleasant stimulus after a few times of being put in the box (i.e. escape learning). In contrast to the first experiment (i.e. the food pellet), the consequence of escaping the electric current (i.e. the removal of an unpleasant reinforcement) ensured they would repeat the action (Schunk, 2014). Skinner then developed this work by teaching the rats to avoid the electric current. To do this, he turned on a light just before the electric current was switched on. The rats soon 'learned' to press the lever when the light came on because they knew that this would stop the pending electric current (i.e. avoidance learning) (Schunk, 2014). From this work, Skinner believed that learning occurs through trial and error.

As Skinner identified, reinforcement can increase the chances that a behaviour will recur (Schunk, 2014). This suggests that in sport, skills could be taught or shaped through reinforcement. While positive reinforcement refers to receiving something that can increase the likelihood of a response (e.g. positive feedback), negative reinforcement refers to removing something unpleasant that would increase behaviour (e.g. criticism). In contrast, punishment can be used to decrease the frequency of an action (but it does not offer information relating to the correct behaviour). This could include asking an athlete/player to pay a fine or remove something pleasant to decrease the undesired behaviour (e.g. benching the athlete/player during a training session). Also, coaches could ignore the negative behaviour of an athlete/player, hoping that by removing her/his attention, the athlete/player will cease the negative activity, this is referred to as extinction. It is important to note that a reinforcer will only strengthen a behaviour if it is 'situationally specific' and if the athlete/player desires it (Schunk, 2014). That is, what may be a reinforcer for one person, may be considered to be a punisher to another (Morgan, 2008). Therefore, a coach would need to know how an athlete would view a potential reinforcer to know its possible effect.

Behavioural theories contend that learning involves the formation of associations between stimuli and responses. For example, learning is viewed as a change in the rate, frequency of occurrence, or form of behaviour or response which occurs largely as a function of environmental factors (Schunk, 2014). Coaches who adopt a behaviourist approach to learning would place athletes in controlled environments (stimuli) and direct them toward specific behaviour

changes (or learning) based upon pre-determined achievement objectives set by the coach. Sessions would be characterised by rote learning, repetition, reinforcement, drill-based activities, and trial and error towards a fixed outcome (Chambers, 2011). Skills are commonly taught through a 'one-size-fits-all', 'all-at-the-same-time' approach with the focus on 'what' to coach and less on the complexities associated with the skills in game play (Light, Harvey & Mouchet, 2014).

COGNITIVISM

In the late 1950s, psychologists found behaviourists' explanations of learning too simple and too dependent upon observational behaviour. Consequently, understandings of learning shifted to the learner's mental processes (Merriam & Bierema, 2014). Those interested in cognitive theories of learning aimed to address the issues of how information is received, organised, stored and retrieved by the mind. Therefore, cognitive theories are underpinned by the assumption that learners actively seek and process information (Schunk, 2004). As such, learning is not concerned so much with what learners *do*; rather, it is *what* they know and *how* they come to acquire it (Jonassen, 1991).

Although there are different strands of cognitivism, they are underpinned by the belief that learning builds upon previous experience (Gould, 2009). In this way, individual information has limited meaning in itself and accumulating more knowledge does not necessarily constitute learning (Schunk, 2014). Learning can only occur when one can relate to the information and see how it 'fits' within the 'bigger picture' (Gould, 2009). For cognitivists, learning is considered to be 'a change in cognitive structures; the way in which we perceive events and organise experiences to arrive at understanding' (Gould, 2009).

Jean Piaget (1896–1980), a Swiss cognitive psychologist, viewed learning to be a developmental cognitive process. Believing that children thought differently from adults, Piaget developed a four-stage model of how the mind processes information. The first two stages focus on how people move from the infancy stage (birth to age 2) of sensorimotor responses to stimuli, to the preoperational stage (ages 2 to 4) in which they are able to represent objects in symbols and words (Merriam & Bierema, 2014). Following this, a

child moves to the concrete operational stage (ages 7 to 11) in which they can understand concepts and relationships to the operational stage (age 11+) in which they can reason hypothetically and think abstractly (Merriam & Bierema, 2014). In Piaget's stage model, children's intellectual development is not simply based on increased information; rather, as children progress through the stages, there are changes in how they think. Piaget used the term *schema* to describe a unit of cognitive structure (Huber, 2013). Schemas include, for example, representations of events, stories and skilled actions. Schemas then, are adjusted or changed through assimilation and accommodation. *Assimilation* occurs as new information is incorporated into existing schema, while *accommodation* is the process in which existing schemas are altered or new schema formed as a person learns new information (Huber, 2013). Given its concern with the progressive adaptation of an individual's cognitive schemes, Piaget's work is evidenced in sporting practices which have been designed to be 'developmentally appropriate'.

SOCIAL COGNITIVE LEARNING THEORY

Cognitive learning theory provides an explanation of how the brain processes information; however, some working within this area believed that learning occurs in a social environment. Social cognitive learning theory, a subset of cognitivism, acknowledges that people acquire knowledge, rules, skills, strategies, beliefs and attitudes by observing others (Schunk, 2014).

Albert Bandura (1925–1976), a Canadian psychologist, found that people could learn new actions by observing others performing them (Merriam & Bierema, 2014). Contrasting behaviourists, Bandura identified that reinforcement was not necessary for learning to occur (Schunk, 2014). Rather, he was interested in how people could learn actions by observing others performing them (Schunk, 2014). He identified that learning through observation was dependent upon the learner's attention, retention, production and motivation. *Attention* refers the learner's focus on the relevant event so that it is perceived in a meaningful way (Schunk, 2014). For example, an athlete's attention can be directed by accentuating features of the task, subdividing complex activities into parts, demonstrating the

usefulness of the modelled behaviour. *Retention* refers to how well the learner will remember the behaviour and can recall what was observed (Huber, 2013). This is increased through repetition (live or video) and relating the material to information previously learned (Schunk, 2014). Assuming the learner has the ability to execute the skill or task being modelled, the learner then reproduces the behaviour in light of the mental representation they retained (i.e. production). In a sports context, this can be assisted by the coach or peers who can provide feedback (Huber, 2013). However, important to this process is the learner's motivation. *Motivation* influences learning because people are more likely to engage in the previous three processes (i.e. attention, retention, production) for activities they feel are important, performing actions which will result in rewarding outcomes and avoiding those which will be received negatively (Schunk, 2014).

Cognitive theories pay attention to the acquisition of knowledge and skills, the formation of mental structures and the processing of information and beliefs (Schunk, 2014). Towards this end, learning is an internal mental phenomenon inferred from what people say and do. Therefore, in contrast to behaviourism, cognitivists view learning as largely detached from the environment and asocial in nature. However, similar to constructivism (to be discussed in the following section), cognitive theories view learners as 'active seekers and processors of information' (Schunk, 2008, p. 132). Coaches who accept a cognitivist approach to learning would break down tasks into steps, which begin with the most basic and build towards the more complex (depending on the athlete's/player's schema or prior knowledge). The coach prepares and transmits the information, but also empowers the mental processes of the athlete/player (Chambers, 2011).

CONSTRUCTIVISM

In contrast to behaviourism and some cognitive approaches, constructivists believe that humans create meaning as opposed to acquiring it. That is, learning is a social process in which learners construct new knowledge. Consequently, learning is seen as a process of continual adaptation and responsiveness to a constantly changing environment (Light, 2008). This recognises athletes'/players' previous knowledge (what they bring to the learning environment/

sporting context) and focuses on the construction of new knowledge or the modification of knowledge based on their learning experiences within the session. Thus, learners build personal interpretations of the world based on individual experiences and interactions, and knowledge emerges in contexts within which it is relevant (Schunk, 2014). Such a perspective positions the coach as a facilitator who asks in-depth and challenging questions to guide the learner with learner enquiry, discovery, autonomy and self-motivation viewed as critical to the success of the learning process (Leonard, 2002).

A popular constructivist theory featured in coaching scholarship is Len Vygotsky's Social Development Theory. Len Vygotsky, a Russian scientist (1896–1934), viewed learning as occurring in a cultural context and involving social interaction. He believed that an individual acquires new mental functions and patterns of thought from the assistance of tools (i.e. cultural objects, language and social institutions – churches, schools) and scaffolding (i.e. support from others) when it is offered within the zone of proximal development (ZPD) (Schunk, 2014).

ZPD is the zone in which learning occurs. This 'zone' is just beyond their range of experience with the assistance of a coach or more capable peer who can help bridge the distance from what the learner can do independently and what they can do with assistance (Schunk, 2014). Here the ZPD is not formed just within the learner, it is the interaction between the learner, the more 'capable' other and the cultural tools that are shared within a culturally mediated interaction (Cobb, 1994; Wells, 1999). Therefore, learning occurs as the athlete/player, bringing their own understanding to the interaction, constructs meaning by integrating these understandings with their experience in the context (Schunk, 2014). The influence of the cultural-historical setting is key to Vygotsky's theory as it not only provides the context in which scaffolding (i.e. assistance from others) takes place, but also enables the learner to develop an improved awareness of themselves, their language and their role in the world (Schunk, 2014). Such participation in the cultural world transforms mental functioning, enabling new forms of awareness to occur.

In contrast to behaviourism and cognitivism, constructivism comprises a range of theories which suggest that learning is most effective when it is active, interactive and authentic (Newmann, 1994). In adopting a constructivist approach to learning, coaches

would actively encourage athletes/players to draw upon prior learning and experience to construct new meanings and understandings (Chambers, 2011). However, this would require that coaches understand the athlete's/player's prior learning in order to build upon it (i.e. construct) new learning. To do this, coaches would need to provide 'task-orientated, hands-on, self-directed activities which are orientated towards design and discovery' (Chambers, 2011, p. 47). At a practical level, this would include creating opportunities for active engagement, participation in groups, frequent interaction and feedback and connections to 'real-world' contexts (Chambers, 2011).

Learning is complex. As illustrated in the first part of this chapter, understanding ways athletes/players may receive and make sense of information is important to coaches who wish to create optimal learning experiences for athletes/players. Coaches' sessions are often structured in ways that reflect their assumptions and beliefs about what learning is and how people learn. However, many coaches may not have considered connections between athlete/player learning and methods or, by extension, there may be disconnect between the learning that they seek and the methods they use within their sessions. Therefore, identifying the underpinning theory of the methods coaches' use is useful as it draws attention to the intended and unintended consequences on athlete/player learning.

COACHES' METHODS

The term 'method' is commonly used when referring to the strategies that coaches use in structuring and designing their sessions. This is often confused or used synonymously with 'style'; however, methods should be viewed as principles in action whereas style is a manner of self-expression (Cassidy et al., 2009; Tinning, Kirk & Evans, 1993). To clarify, 'techniques and methods are available to all [coaches], the way in which they are used determines the [coaches] style' (Willee, 1978, p. 20). Therefore, coaches may draw upon similar methods, but they may use very different styles.

A popular approach to viewing coaches' methods is Mosston's spectrum of teaching styles (Mosston, 1966). Given that methods are principles in action and style is a manner of self-expression, in this chapter Mosston's work will be referred to a spectrum of methods. The

spectrum includes eleven methods that are presented on a continuum from viewing athletes/players as passive or active learners. Here, the passive approaches (or coach-centred methods) are those that promote a robotic approach to sporting performance whilst the active learning approach (or athlete/player-centred methods) would positively impact upon decision making and problem-solving abilities of the athlete/player. In 1996, Mosston's spectrum was adapted by Kirk and colleagues who reduced it to five methods which ranged from coach-centred to athlete/player-centred (i.e. directive/command, task, reciprocal, guided discovery and problem solving). This approach was used by Cassidy et al. (2004, 2009) and will also be adopted in this chapter.

Coaches may draw upon more than one method in their session as, often, the choice of method is influenced by the nature of the subject matter and the context in which the learning will occur (i.e. indoor/outdoor) (Kirk, Naught, Harahan, Macdonald, & Jobbing, 1996). Additionally, coaches' choice of methods would reflect their views of learning, in particular, the relationship between the coach, learner, subject matter and the learning environment (Armour, 2011; Cassidy et al., 2009).

Table 6.1 provides a brief description of the five methods that will be discussed in light of behaviourism and constructivism. Notably absent here is a discussion of cognitivism; however, there is some overlap between cognitivist theories and constructivism. Additionally, cognitivism might be evident in how coaches decide which skills are relevant to the age group they are coaching and in how they demonstrate skills and/or provide instruction.

BEHAVIOURISM AND COACHES' METHODS

As mentioned previously, behaviourism is a theory that focuses on the modification of behaviour through stimulus-response and selective reinforcement. Successful learning, then, is determined through changes in behaviour (Chambers, 2011). In relation to coaches' methods, behaviourism underpins the direct or command method which is popular among coaches. As highlighted in Table 6.1, a directive or command method positions the coach as the knowledgeable one who provides the information and direction to the athletes/players. The coach privileges demonstration and feedback

Table 6.1 Coaches' methods (based on information from Mosston & Ashworth, 2008 and Cassidy et al., 2009)

Method	Characteristics
Directive/command	- The coach makes the decisions about how athletes/players are organised, the subject matter, how the tasks should be executed (privileges demonstration), when tasks start/stop and/or change. The coach supervises and corrects athlete/player errors. - The athlete/player performs accordingly (i.e. replicating the subject matter).
Task-based	- The session comprises several different tasks (e.g. circuit) which can be undertaken simultaneously. - The coach makes decisions regarding the task, what will be accomplished and how (e.g. the order of the task, equipment information, intervals), but provides time for each athlete/player to work individually. This enables the coach to provide individual feedback. - The athlete/player can work independently from the coach and has the opportunity to make some decisions (e.g. the order of the task, starting time, pace and rhythm, stopping time, interval, location, attire/appearance and to ask questions for clarification).
Reciprocal instruction	- Requires athletes/players to work with one another in partnerships. - The coach designs the session to suit the abilities and needs to the athletes/players. The coach matches the athletes/players so that one is more skilled/knowledgeable than the other. The coach introduces the task, provides the performance criteria, asks for clarification, observes the partnerships, listens to the interaction and provides feedback to the group. - In partnerships, one athlete/player takes the role of a 'doer' who performs the task, while an 'observer' offers immediate and ongoing feedback (the roles reverse following achievement of the behaviour).
Guided discovery	- Incorporates activities/tasks that encourages athlete/player independence. - Through a logical and sequential design of questions, the coach attempts to gradually lead the athlete/player to discover the end result (i.e. a concept, movement, etc. which is unknown to the athlete/player). - By responding to the coach's questions, the athlete/player engages in the discovery of concepts.
Problem solving	- The coach establishes a problem (e.g. a situation the athlete/team has experienced) or question/situation/issue and sets the parameters (e.g. equipment, time, location). - Athlete/players engage in the task by discovering and producing solutions (e.g. combination of movements, strategy).

(i.e. the information that the coach would like to see replicated) and provides reinforcement. An example is a fitness coach who leads the warm up or the warm down. The fitness coach decides which activities to include, the order of activities and the time allocated for each activity without differentiating for each athlete/player. Some would argue that this approach maximises learning as it organises information into logical progressions. However, others argue that it takes little account of learner's needs and interests which limits its effectiveness (Cassidy et al., 2009; Kirk et al., 1996).

Another example of behaviourism is the task-based method. This method comprises several different tasks, which are arranged in stations (e.g. a circuit). Such an approach enables athletes/players to work more independently from the coach as it places slightly more responsibility on the learner than the directive or command method. There is space for the coach to recognise the diversity of the athletes/players by creating or adapting tasks which will meet their needs (Cassidy et al., 2009). Additionally, a task-based method could have social benefits. However, similar to the direct or command method, the coach still controls the flow of information (they decide what tasks to include), which encourages athletes/players to reproduce the coach's knowledge. As this method (and the direct or command method) encourages athletes/players to memorise rather than understand, there is limited opportunity for athletes/players to understand the nuances of the game/activity.

CONSTRUCTIVISM AND COACHES' METHODS

Recent work in coaching has endorsed methods which are underpinned by constructivism. These methods appeal to coaches who believe that athletes/players should be primarily responsible for their own learning. That is, in contrast to being a passive sponge soaking up knowledge, the athlete/player is viewed as 'a thinking, feeling and physical being that interprets and makes sense of learning experiences shaped by the knowledge and inclinations that [s/he] brings to the learning experience' (Light & Evans, 2010, p. 104). Three methods that are underpinned by constructivism are reciprocal, guided discovery and problem solving.

RECIPROCAL INSTRUCTION METHOD

Similar to directive/command and task-based methods, reciprocal instruction still involves the coach selecting and sequencing the subject matter. However, it moves beyond behaviourism in that learning becomes social as athletes/players work together to discuss or develop the material to suit their needs (Kirk et al., 1996). Such an approach enables athletes/players to undertake these roles (although the coach may have initial involvement in teaching them how to perform them) (Kirk et al., 1996). It also enables coaches to organise athletes/players according to ability and experience or knowledge of the sport. For example, putting the less experienced athletes/players with those who are more experienced (i.e. a more capable peer). This would allow athletes/players to appreciate the skills and perspectives of others as well as encourage the development of feedback and an improved understanding of skill execution, enabling athletes/players to improve their analytical, physical and communication skills (Cassidy et al., 2009). Additionally, pairs could be joined together to form small groups, encouraging co-operative learning (Kirk et al., 1996). However, it may be naïve for a coach to think that all athletes/players want to help one another. Rather, a more experienced athlete/player may view sharing their knowledge and helping another player as threatening to her/his position on the team.

GUIDED DISCOVERY AND PROBLEM SOLVING

Guided discovery, as a method, requires helping athletes move through a series of tasks in response to a number of questions. These questions are carefully aimed at helping the athletes discover a concept or a solution. For example, rugby coach Wayne Smith – former coach of the New Zealand men's rugby team, the All Blacks – provided an example of how he used questioning with his players. He described a scenario used in a training session in which he puts three attackers against two defenders (Kidman, 2005). 'The obvious thing would be for the second attacker to draw the last defender and pass to the outside guy because he is the one in space' (Kidman, 2005, p. 197). Based on the players' responses to the scenario, the coach can ask questions regarding their understanding (i.e. if the player does or does not understand what needs to be done, but cannot execute the

skill). For example, Smith (in Kidman, 2005, p. 197) talked through a conversation he might have with one of the attacking players:

- Coach: What did you do?
 Player: I held onto the ball.
 Coach: Where was the space?
 Player: Outside.
 Coach: Why did you hold onto the ball?
 Player: I couldn't get the pass away.
 Coach: Why couldn't you get the pass away?
 Player: He was on me too quick.
 Coach: How could you give yourself a bit more time?
 Player: I could slow down?
 Coach: What would you need to do to slow down?
 Player: Take shorter steps.

As illustrated in this example, the athlete requires cognitive processing to work through the questions posed by the coach. However, the outcome has been determined by the coach, so her/his expertise is still paramount to the approach (Kirk et al., 1996). This differs to the problem-solving method which allows for a more varied outcome. Continuing with an example from rugby, a coach might use the following scenario: 'There's 15 minutes remaining, you're leading by 2 points and playing into the wind. The opposition has one front row forward suspended for 10 minutes and it's a lineout on the halfway line.' The coach gives the players 10 minutes to discuss options. After that time, the coach calls the group together and asks them about the scenario, their options (e.g. their priorities with respect to applying pressure, pitch position, penalty or possession of the ball) and, as a group, discusses how this information could be useful in future matches.

Problem solving places less emphasis on the coach, as the athletes/players take responsibility for solving the problems. Solving problems requires the athlete/player to draw upon her/his previous knowledge, preferred pace at which to work and develops skills in taking responsibility for her/his learning (Kirk et al., 1996). This method would suit tasks that require more complex cognitive processes, such as adapting game play.

TEACHING GAMES FOR UNDERSTANDING (TGfU)

One of the most well-known constructivist approaches is Teaching Games for Understanding (TGfU). TGfU was developed in the early 1980s in response to educators' concerns that children (and adults) were good performers of skills, but were poor 'players' who did not understand the games they were playing (Almond, 2010). Therefore, at its core, TGfU places emphasis on players developing an understanding of the game and the learning of skills within contexts that resemble the full game to give them meaning and authenticity. In contrast to telling players what to do, this approach challenges them to find out. Here, games are useful to present problems to participants regardless of their age, ability and experience. In addition to improving understanding of the game, athlete/player motivation may also be influenced.

TGfU is useful as it allows for a range of learning strategies. For example, offence and defence strategies can be developed through guided and progressive practice conditions that more appropriately simulate the game environment (Hubball, Lambert & Hayes, 2007). Some coaches believe that TGfU does not provide opportunities to learn skills; however, it has been argued that skill acquisition is best developed in circumstances that most resemble the situations in which it will be used (as opposed to teaching it in isolation) (Almond, 2010). Therefore, a games-based approach enables athletes/players to improve the cognitive dimensions of their play without detracting from skill development (Light, 2006).

In Australia, TGfU developed into Game Sense in the mid-1990s. Similar to TGfU, Game Sense is a player-centred, games-based approach which aims to promote game appreciation, tactical awareness and decision making, and is premised on the belief that skills learnt within the context of games or game-like situations are more easily transferred to competitive matches (Light, 2006). Furthermore, athletes/players who understand the dynamics of the sport and are disposed towards independent problem solving are likely to learn more effectively (Light & Wallian, 2008).

While TGfU and Game Sense are appealing in that they could contribute toward, for example, an improved understanding of the game, better game play and increased athlete/player motivation (Light & Wallian, 2008), the success of these approaches hinges

upon the coach's ability to ask meaningful and probing questions. These questions need to extend the athlete's/player's knowledge and encourage the athletes/players to respond (Kidman, 2005). In order to achieve these aims, coaches need to consider the types of questions they use. For example, lower order questions (i.e. those that focus on 'what' and 'where') require little cognitive involvement, so would not be of use in extending athlete's/player's knowledge. In contrast, questions that encourage athletes/players to analyse and integrate previous knowledge or encourage decision making and/or problem solving (i.e. those that focus on 'why' and 'how') require more cognitive involvement. Therefore, coaches need to ensure they are using relevant and meaningful questions that engage and challenge as opposed to asking questions for the sake of it. Wayne Smith, rugby coach, cautioned that some coaches may feel the need to over-question athletes/players (Kidman, 2001). Additionally, there is a danger that the coach could set irrelevant problems or accept any solution (Cassidy et al., 2009). This may be due to an uncertainty of how to create meaningful problems, a lack of clarity of the types of questions to use, when to ask questions, or feel the need to advise rather than let the athletes work through the scenario/situation (Kidman, 2001). Here, coaches need to read the situation as it unfolds.

TGfU and Game Sense have been adopted by coaches working with athletes/players of all levels and domains. As mentioned earlier, Wayne Smith utilised the Game Sense approach with the Canterbury Crusaders and the All Blacks. While some coaches, clubs and/or sports organisations have embraced TGfU and Game Sense, not all have been as accepting. Some have argued that coaches may be hesitant to engage with these methods as they challenge 'traditional' coaching practices (Reid & Harvey, 2014). That is, TGfU and Game Sense require that the coach acts as a facilitator of learning rather than a director of it (Light & Evans, 2010). This may make coaches uncomfortable as it challenges their understanding of 'what coaches do' (i.e. the coach is the 'expert') and their beliefs and assumptions about what comprises 'good' coaching (Harvey & Jarrett, 2014; Reid & Harvey, 2014). Also, TGfU and Game Sense require that coaches have a deep understanding of the game, but many coaches feel they do not know the games well enough to deliver sessions in this way.

Finally, coaches also need to consider the expectations of the athletes/players (as mentioned in Chapter 4). If coaches are willing to challenge the time-honoured methods which have prevailed in their sport and engage in Game Sense or TGfU, it would be useful to explain to the athletes/players what they are doing and why; allowing the athletes/players to become used to the different approach (Cassidy et al., 2009).

SUMMARY

The methods coaches use often link to their ideas of how athletes/players learn, the culture of the sport (i.e. what coaching 'looks like', what a 'normal' training session looks like), their experiences of coaches who used similar methods and athletes'/players'/parents' expectations. However, these ideas appear to be based on assumptions that the familiar or observed behaviours are not problematic. Additionally, coaches might know that something works, but do not know why. In an effort to provide a 'foundation' for coaches' decisions regarding the methods they use, this chapter has drawn attention to behavioural, cognitivist and constructivist learning theories. This was followed by a discussion of five methods used by coaches (i.e. direct/command, task, reciprocal, guided discovery and problem solving) which require various levels of coach involvement, but have differing implications on athlete/player learning. For example, a rote-drill practice, which is characteristic of coaches who use the directive/command approach, would not be productive if the coach's aim is to develop athlete's/player's decision making and problem solving. This aim would be better met by constructivist approaches such as Teaching Games for Understanding (TGfU) and Game Sense which provide problem-based learning, encouraging athletes to find relevance in existing knowledge and experience, and make connections to the outside world (Gore, Griffiths & Ladwig, 2004). Additionally, while scholars are increasingly arguing that the most effective way to learn is via constructivism, readers can consider the practices relating to behaviourism and cognitivism (e.g. feedback, evaluation) which still serve a useful purpose in training sessions. The take home message here is that coaches need to consider how the methods they adopt influence athlete/player learning.