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Thomas M. Leeder

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Behaviorism, Skinner, and Operant Conditioning:

Considerations for Sport Coaching Practice

By Thomas M. Leeder 

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It goes without saying that sport coaches are influential in shaping athletes' learning and development. To support athlete learning, sport coaches adopt a variety of coaching approaches, despite generally possessing a low awareness of their behaviors and practice. A coach's preference for a particular approach is often developed experientially over time through processes of socialization as both an athlete and coach (Cushion et al., 2003). However, regardless of a coach's preference, all coaching practice reflects implicit assumptions about both coaching and learning, which are rooted in strong personal experiences and beliefs (Armour, 2010; Light, 2008; Lyle & Cushion, 2017).

Although sport coaches might not be able to articulate their assumptions and beliefs about coaching, ultimately their practice is influenced by specific theories about how people learn (Cushion, 2010; Light, 2008). One learning theory that strongly informs coaching practice is behaviorism (Cushion, 2010), with its assumptions often portrayed as a "traditional" form of coaching (Cushion, 2013). Although coaches at various levels may adopt a "traditional" coaching approach, it is perhaps fair to say that few will have contemplated the underlying theoretical assumptions and their relevance for coaching (Light, 2008), even though both theory and practice are intrinsically connected (Nelson et al., 2016).

Consequently, the aim of this article is to provide a concise overview of the theoretical assumptions of behaviorism. Many theorists are associated with behaviorism (e.g., Pavlov, Thorndike and Watson); however, this article draws on Burrhus Frederic Skinner's (1904–1990) theory of operant conditioning and its considerations for sport coaches. Lyle and Cushion (2017) indicate there are no quick fixes or a best way in pedagogical activities such as sport coaching. Therefore, this article does not present Skinner's theory of operant conditioning as superior or inferior to other learning theories. Rather, this article is founded on the belief that coaches would benefit from a greater understanding of their assumptions about learning, enabling them to make more informed choices and modifications to their coaching practice (Cassidy et al., 2016; Light, 2008).

What is Behaviorism?

Behaviorism formed the dominant view of learning for much of the 20th century (Light, 2008). Although there are several interpretations, behaviorists typically view learning as a change in the rate, frequency, or response in behaviors of an individual, through a series of stimulus–response connections (Schunk, 2012). Furthermore, within behaviorism, learners are passive in the learning process (e.g., they are the recipients of knowledge), with feedback alongside reward/punishment systems emphasized as methods to modify and correct behavior (Light, 2008). In coaching, behaviorist assumptions are often portrayed as a "traditional" form of coaching practice (Cushion, 2013). Behaviorist (or "traditional") coaching practice is regularly characterized by

highly structured coach-led technical practices, with coaches attempting to control the environment through utilizing corrective feedback and repetition (Light, 2008; Lyle & Cushion, 2017).

Skinner's Theory of Operant Conditioning and Sport Coaching

B. F. Skinner's theory of operant conditioning is particularly relevant when considering pedagogical activities, such as sport coaching (Roberts & Potrac, 2014). Skinner was primarily interested in the role of reinforcement and punishment and how they can modify behavior. He argued that an observable response (e.g., a behavior), will change because of a consequence, such as the use of reinforcement or punishment (Cassidy et al., 2016). Thus, learning occurs when behavior is either rewarded or punished, as an association is made between a behavior and its associated consequences. Skinner suggested that if behaviors have consequences that are reinforcing, they are more likely to occur again (Groom et al., 2016). Reinforcement can be positive or negative, but both types aim to strengthen behavior (Schunk, 2012):

- Positive reinforcement refers to the process of adding a pleasant stimulus to strengthen behavior and increase the likelihood of it occurring again.
- Negative reinforcement refers to the process of removing an unpleasant stimulus to strengthen behavior and increase the likelihood of it occurring again.

In coaching, positive reinforcement may involve a coach praising or rewarding an athlete for executing a specific technique (e.g., adding a pleasant stimulus such as praise to strengthen behavior). Negative reinforcement may involve a coach removing something unpleasant, such as extra training, when athletes perform well (e.g., removing an unpleasant stimulus such as extra training, to strengthen behavior). Research investigating coaching behaviors has outlined that frequently providing positive reinforcement in the form of praise and removing the use of negative reinforcement is a significant aspect of coaching practice (see Cushion, 2010; Smith et al., 1979).

For reinforcement to be effective, its scheduling needs to be considered (Cassidy et al., 2016). Coaches should strive to develop environments where desired behaviors can be positively reinforced as close to the response as possible; preferably immediately after it occurs (Groom et al., 2016). Broadly, Skinner (1953; 1974) proposed that schedules of reinforcement can be *continuous* (after every correct response) or *intermittent* (after some but not all correct responses). However, *intermittent* schedules of reinforcement can be separated further into *ratio schedules* (reinforcement is dependent on the frequency of correct responses) or *interval schedules* (reinforcement is dependent on specific time periods), which can be either *fixed* or *variable* (Schunk, 2012).

Table 1 provides examples of scheduling reinforcement within sport coaching.

Skinner (1974) stressed that punishment is significantly different than negative reinforcement, as it aims to reduce the likelihood of a behavior occurring, as opposed to increasing. While complex, punishment can also be positive or negative. Positive punishment involves introducing an unpleasant stimulus to decrease the likelihood of a behavior occurring. In contrast, negative punishment involves removing a pleasant stimulus to decrease the likelihood of a behavior occurring. Table 2 demonstrates the differences between positive/negative reinforcement and punishment, with practical coaching examples.

In considering Skinner’s theory of operant conditioning, four reflective questions for sport coaches are outlined below.

What are your desired behaviors?

Skinner (1968) outlined three conditions required for learning to occur. These are: (1) an occasion (i.e., a coaching session); (2) a desired behavior (i.e., a skill or technique); and (3) consequences of that behavior (i.e., reinforcement or

punishment) (Groom et al., 2016). In addressing the second point, coaches must clearly articulate to their athletes what behaviors they desire, while ensuring reinforcement is dependent on the performance of the desired behavior (Smith, 2015). Consequently, if the desired behavior is clear (e.g., a modeled sport-specific technique), athletes will understand why reinforcement is being given.

What types of reinforcement will you use?

Positive and negative reinforcement will strengthen an athlete’s behavior; however, it is vital that coaches know what works, why, and for which athletes—for reinforcer effectiveness (Cassidy et al., 2016). Reinforcers are both individually and situationally specific (Schunk, 2012). This means that it may be hard for a coach to predict what reinforcers work and for which athletes, as their motivations, intentions and needs will vary. For example, Rushall and Pettinger (1969) identified over 50 years ago that athlete reinforcers are unique and personal, with age and experience influencing which reinforcers result in greater effort during training (Cassidy et al., 2016). Therefore, coaches may be required to engage in “trial

Table 1. Scheduling of reinforcement with sport coaching examples. Definitions adapted from Schunk (2012) and Skinner (1974).

| Type: | Definition: | Coaching Example: |
|-------------------|---|---|
| Continuous | Reinforcement provided after every correct response | During a shooting practice, a netball coach praises their goal shooter after every successful attempt |
| Intermittent | Reinforcement provided after some but not all responses | During a shooting practice, a netball coach praises their goal shooter after some but not all successful attempts (e.g., reinforcement follows no set pattern) |
| Fixed-ratio | Reinforcement provided after a set number of correct responses | During a shooting practice, a netball coach praises their goal shooter after a set number of successful attempts (e.g., reinforcement provided after every fifth successful attempt) |
| Variable-ratio | Reinforcement provided after a variable number of correct responses, based around a set average | During a shooting practice, a netball coach praises their goal shooter after every fifth successful attempt on average, but the number of successful attempts between reinforcement varies (e.g., reinforcement provided after the second, sixth and seventh successful attempt, averaging out at every fifth successful attempt) |
| Fixed-interval | Reinforcement provided after a set time interval | During a shooting practice, a netball coach praises their goal shooter for their successful attempts after a set time interval (e.g., reinforcement provided after every 5-minute interval) |
| Variable-interval | Reinforcement provided after variable time intervals, based around a set average | During a shooting practice, a netball coach praises their goal shooter for their successful attempts every 5 minutes on average, but the time intervals between reinforcement vary (e.g., reinforcement provided after every 2, 3, 7 and 8 minutes, averaging out at every 5 minutes) |



and error” over time to discover which reinforcers impact athlete behavior in the desired way.

How will you schedule reinforcement?

Having discovered which reinforcers work, coaches should decide how frequently reinforcement will be provided. Coaches must consider several contextual factors, such as the age and ability of their athletes (Smith, 2015), in addition to the type of reinforcement given. For example,

younger or novice athletes may require *continuous* reinforcement after every correct response to shape behavior, whereas older or elite athletes may benefit from *intermittent* reinforcement. Coaches should also reflect on the time lag between athlete behavior and reinforcement delivery, as a delay may reduce the impact of any reinforcement (Groom et al., 2016). Therefore, coaches should attempt to provide reinforcement immediately after an athlete demonstrates the desired behavior.

Table 2. Positive/negative reinforcement and punishment with sport coaching examples. Definitions adapted from Schunk (2012) and Skinner (1974).

| Type: | Definition: | Coaching example: |
|------------------------|---|--|
| Positive reinforcement | Adding a pleasant stimulus to increase desired behavior(s) | A tennis coach praises an athlete after a good performance |
| Negative reinforcement | Removing an unpleasant stimulus to increase desired behavior(s) | A basketball coach stops gesturing disapprovingly toward their players after they successfully execute a set play in training |
| Positive punishment | Adding an unpleasant stimulus to decrease undesirable behavior(s) | A soccer coach makes the team stay an extra 10 minutes after training to make up the missed work from arriving 10 minutes late |
| Negative punishment | Removing a pleasant stimulus to decrease undesirable behavior(s) | A lacrosse coach does not select a player for the match day squad due to their poor attitude and laziness during training |



The aim of this article is to provide a concise overview of the theoretical assumptions of behaviorism, which largely informs “traditional” approaches to sport coaching.

How will you eliminate unwanted behaviors?

Skinner (1953) outlined how punishment has a temporal nature and ultimately may not eliminate unwanted behaviors. Thus, if coaches are to use punishment and aversive forms of control, which historic research suggests they do (Groom et al., 2016; Smith et al., 1979), they must be aware of their impact. Although punishment may suppress a response, it may condition dysfunctional behaviors in athletes, alongside creating conflict within the coach-athlete relationship (Schunk, 2012; Smith, 2015). For example, if coaches use punishment inconsistently, it may result in athlete anger, frustration and resentment. Therefore, coaches might consider alternatives to punishment, such as extinguishing unwanted behavior; for example, ignoring athlete misbehavior so it is not reinforced, or perhaps conditioning an incompatible behavior, such as praising performance that only occurs when an athlete is behaving in the desired manner (Schunk, 2012). Indeed, if coaches use positive reinforcement rather than punishment, long-term benefits for athletes, such as increased enjoyment and self-esteem, are more likely to occur (Groom et al., 2016; Smith et al., 1979).

Conclusion

The aim of this article is to provide a concise overview of the theoretical assumptions of behaviorism, which largely informs “traditional” approaches to sport coaching. Specifically, B. F. Skinner’s theory of operant conditioning and its considerations for sport coaches and coaching practice have

been highlighted. It is hoped this article has encouraged coaches to “reflect on previously unconsidered theoretical notions, thus giving them the options to think in different ways about their practice and consequences” (Jones, 2006, p. 4).

It is important to remember that “no one theory is correct” (Lyle & Cushion, 2017, p. 254), with behaviorism among other learning theories (e.g., cognitivism, social constructivism) possessing their respective assumptions and critiques (Roberts & Potrac, 2014). Thus, coaches must make choices about learning and how it might be pursued within their specific context (Nelson et al., 2016), alongside reflecting on their intended outcomes, athlete preferences, and their perceptions towards the coaching role (Cushion, 2010; Lyle & Cushion, 2017). Facilitating player learning is a complex process (Roberts & Potrac, 2014); therefore, it is perhaps fair to suggest that effective coaches will adopt a range of coaching approaches, each informed by different theoretical assumptions. In summary, it is hoped this article has prompted coaches to consider the theoretical assumptions informing their current practice and whether they are appropriate for their coaching context and athlete needs.

ORCID

Thomas M. Leeder  <http://orcid.org/0000-0002-7456-2175>

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Thomas M. Leeder (thomas.leeder@essex.ac.uk) is a lecturer in the School of Sport, Rehabilitation and Exercise Sciences at the University of Essex in Colchester, UK.