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Introduction

Ask athletes the percentage of sport performance that is mental, and they will often give estimates around seventy-five percent. Next, ask what percentage of their *training* is mental. Zero is the common response. While sport psychologists do not advocate for athletes to substitute a 50-mile bike ride with a 3 h imagery session, we do recommend supplementing physical training with mental training. Sport psychologists assist athletes with mental health and mental skills training in order to improve their sport performance. In this chapter, we focus on mental skills training for endurance sports.

Mental skills training can “...enhance athletes’ chances of performing at their highest level under very demanding, stressful, and sometimes even hostile conditions” [1]. Imagine a cross-country skier battling icy wind, a cyclist trying to avoid a crash while flying down a steep decline, or a runner trudging through mile 20 of a marathon. Endurance sports often present such stressful, demanding conditions, and athletes who are mentally prepared will be the ones to thrive.

Mental skills training has positive effects on endurance sport performance, according to one literature review [2]. In particular, goal setting, imagery, and self-talk show consistent effectiveness for endurance sport performance. More research is needed to learn how and for whom these mental skills work.

Mental training interventions occur individually or in packages. Individually, mental skills include motivation, goal setting, arousal or energy management, self-talk, focus, imagery, routines, mindfulness, and team building. While sport psychologists commonly teach several mental skills in combination, more research is needed to determine if mental training packages add more improvement than individual skills. Packages including goal setting, energy management, imagery, and self-talk have improved triathlon performance [3] and 1600 m running performance [4].

Get ready to psyche up for endurance sports! Because it takes inordinate discipline to excel as an endurance athlete, we start with a discussion about motivation. Then we dive into specific mental skills to train your mind as well as your body. We finish the chapter with a discussion of finding balance in exercise. Here is the order of topics in this chapter:

- Motivation
- Goal setting
- Energy management
- Self-talk
- Focus

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- Imagery
- Performance routines
- Mindfulness
- Exercise balance

Motivation

Motivation is likely one of the most important psychological constructs in sport, especially within endurance sport. The ongoing energy required for endurance athletes to persist in repetitive high-quality, grueling training sessions, even in the face of adversity and other life demands, exemplifies motivation as a foundational requirement for high performance and achievement. As such, it is no surprise that trainers, coaches, organizations, and athletes alike all have vested interest in understanding, developing, and maintaining motivation.

Research has consistently shown that motivation is a crucial factor in human behavior because it influences the initiation, direction, intensity, and persistence of specific goal-directed behavior [5]. Self-determination theory [5] focuses on the strength of athletes' motivation to perform particular behaviors and has been increasingly applied to sport [6]. SDT focuses on the factors that influence athletes' decisions to perform and persist in sport. One such factor is the goals or motives that athletes cite for engaging in their sport [6]. Specifically, a distinction is made between *intrinsic* (i.e., establishing meaningful relationships, feeling a sense of community, gaining knowledge, finding stimulation, and achieving personal growth) and *extrinsic* goals or motives (i.e., winning, seeking fame, obtaining an appealing appearance, and achieving financial success) [5].

Within self-determination theory [5], goal type has implications for personal and relational functioning. Intrinsic goals focus on developing personal interests, values, and potential and are inherently satisfying to pursue [6]. According to SDT, the pursuit of intrinsic goals will lead to both sustained engagement in the behavior as well as more positive psychological outcomes (e.g., well-being, self-esteem) [7]. In contrast, extrinsic goals are more outwardly oriented, directed toward

external indicators of worth, leading to the less inherent satisfaction and human development [7]. While the desire to win to prove something to others can be motivating, athletes must be careful in their utilization of extrinsic motives for they may undermine the development of intrinsic motivation. Relying solely on extrinsic motives might limit the ability for endurance athletes to sustain training requirements for the long haul and decrease their enjoyment of the process.

Some strategies for increasing intrinsic motivation include building on past success, preparation, positive reinforcement, variety in training, and athlete contribution to training [8]. Successful experiences increase perceived intrinsic ability and strengthen personal competence. For example, athletes experience success by setting small goals and reaching them. Adequate preparation is also essential for endurance athletes. Slowly progressing through a training protocol will be more motivating than going for a long distance without sufficient training. Rewards that are contingent with performance can be beneficial. For example, Bill has been gunning for a particular pace on a training run, and once he reaches it, he rewards himself with his favorite meal.

Verbal and nonverbal praise from athletes and coaches can provide positive feedback that helps increase motivation. Further, motivational self-talk has also been shown to improve performance in whole body endurance activity [2]. Mixing up the training process by varying drill sequences or activity days can keep training stimulating and more motivating. Finally, allowing athletes to have a say in training, and other related decisions, can increase autonomy and intrinsic motivation. Understanding the need for increasing and maintaining higher motivation levels is critical for athletic success in endurance sport. Appropriately tapping into intrinsic and extrinsic motivation is essential to developing this performance fuel.

Goal Setting

A goal is a target, specific standard, or accomplishment that one strives to attain, usually within a specified period of time [9]. Goal setting and

has been shown to consistently facilitate sport performance [10]. Objective goals are those that are measurable, such as “I want to run a half-marathon in under two-hours” [11]. Subjective goals, on the other hand, are more general statements of intent, such as wanting to do well at the race [11].

Goals have commonly been further divided based on whether the intention of the goal is outcome, performance, or process driven [11]. An outcome goal usually focuses on the result of an event, such as wanting to win a race, gain entry into an event, or earn a medal. Performance goals focus on achieving objectives that are in comparison to one’s own previous performance rather than the performance of competitors. For instance, wanting a personal record in a marathon or lowering one’s swim time during a triathlon are examples of performance goals. Finally, process goals focus on executing concrete actions in order to perform well [11]. For instance, focusing on spearing the hand into the water during each swim stroke or pushing and pulling with each pedal revolution are pertinent process goals. When used systematically, goals help athletes plan, evaluate, and manage their behavior and thoughts [10].

In general, when compared to no goals or vague “do your best” goals, specific goal setting has been shown to enhance athletes’ performance [9]. Outcome goals, though uncontrollable, are attractive and exciting—useful in enhancing the motivation needed for the physical and mental grind of training [9]. Performance goals offer more control and flexibility, thus allowing athletes the opportunity to raise and lower their goal difficulty to remain challenged and excited [9]. Athletes use process goals in immediate situations to enable focus on specific task demands in productive ways [9]. Considered collectively, setting outcome, performance, and process goals offers unique benefits to maximizing performance.

Within endurance sport, goal setting has been shown to improve performance. In particular, using goals helped high school runners improve their 2.3 km times and nonathletes cycle for longer durations during an incremental test [2]. Further, in a gymnasium sprint triathlon, outcome,

performance, and process goals all positively impacted race day performance [3]. These endurance sport data, combined with many years of goal setting research in other sport performance domains, yield clear and consistent results for goal setting as a performance-enhancing strategy.

There are guidelines which improve the effectiveness of goal setting [10]. Set specific goals in measurable and behavioral terms, which makes it easier to detect progress. Set moderately difficult but realistic goals to remain challenged enough to be motivated, instead of frustrated from repeated failure. Set short-range and long-range goals to stay focused on the path and experience small successes along the way. As noted above, outcome, performance, and process goals all offer benefits to enhancing performance when used appropriately. Set goals in both practice and competition to enhance performance. Set positive goals instead of negative goals, which allows athletes to focus on what they want to accomplish, not reminding themselves of what they do *not* want to accomplish. Identify targets for goal attainment to improve focus and promote a sense of urgency, such as completing a half marathon within 4 months. Finally, write goals down and frequently evaluate them to stay on the path toward success.

Energy Management

Too high or too low? Some athletes experience excessive anxious energy prior to competition, causing tense muscles and wasted energy. Others feel too flat or tired to perform well. Athletes have an optimal zone of energy (also known as arousal or emotion) in which they perform best, and mental training helps them find that ideal energy zone.

Following the tenet of “moderation in all things,” it appears a moderate level of energy works well for most athletes [12, 13]. But due to the complexity of behavior, researchers have theorized more multifaceted relationships between energy and performance. Hanin proposes that individuals vary in the amount of energy they

need to succeed in sport, depending on their personality and sport event [14]. For example, sensation-seeker Shannon swims faster in shorter events like the 200 freestyle when she has high energy, whereas anxiety-prone Sean rows best in the longer single sculls event when he’s more relaxed.

Individual interpretation of energy level is also important, according to reversal theory [15]. Shannon views her fast heartbeat as excitement and a sign she’s ready to swim fast. Sean, however, interprets the butterflies in his stomach as unpleasant anxiety—a feeling of dread. McGonigal found that stress can be good for us if we reframe a thumping heartbeat and butterflies flitting about in the stomach as a sign our bodies are preparing to rise to the challenge [16].

When athletes have too much energy or anxiety, relaxation strategies are often helpful [17]. A key skill is diaphragmatic breathing, also known as belly breathing. To practice diaphragmatic breathing:

- Place one hand on your chest and one hand on your belly (below belly button).
- Inhale through your nose, exhale through your mouth.
- When you inhale, keep the hand on your chest still, while pushing out the hand on your belly with air (the opposite of “sucking it in”).
- Exhale completely...let your shoulders droop as you breathe out.
- The diaphragm is the muscle beneath your lungs...you’ll feel that drop or push down as you inhale, which allows your lungs to expand down into your chest cavity.

Another calming breathing strategy is paced breathing which involves a shorter inhale and a longer exhale [18]. For example, breathe in to a count of two, and breathe out to a count of four. Paced breathing has been shown to reduce heart rate.

When athletes are too low in energy, they often feel tired and flat and may suffer a “let down” [19]. Strategies to increase energy include quick, shallow breaths and jumping up and down. According to Cuddy, holding the body in a “power pose” for 2 min decreases cortisol (stress)

Table 18.1 Energy management strategies

Too nervous? Chill out	Too flat? Pump up
Take diaphragmatic breaths, paced breaths	Take fast, shallow breaths
Repeat trigger word like “Just do my best”	Move your body. Jump up and down
Focus on the process, the controllables	Alternate contracting and relaxing muscles
Reexperience your best performance	Review your most important goal
Get perspective—it’s just a sport!	Walk and talk quickly. Act as if you’re energized
Listen to happy music, a comedy routine	Listen to pump up music
Talk to a friend about your stress	Repeat an affirmation “I’ve got great stamina”
Hold a power pose for 2 min	Hold a power pose for 2 min

and increases testosterone (feelings of energy and power) [20]. See Table 18.1 for more “chill out” and “pump up” strategies [17, 19–21].

Self-Talk

“Push harder.” “I can’t keep up.” “Why the *hell* am I doing this?”

Sound familiar? Self-talk is what athletes say to themselves before, during, and after training and competition. Cognitive-behavioral theory, which challenges dysfunctional self-talk, is a cornerstone of mental training for sports.

Cognitive theories espouse that our reactions do not stem from the events that happen to us, but rather from how we *interpret* those events. For example, Amy and Sienna both swallow water during the swim of a triathlon. Amy thinks, “Oh, no! Why does this always happen to me? I suck at swimming. My race is ruined.” In contrast, Sienna thinks, “Yuck. This happens to lots of swimmers. Breathe. One stroke at a time.” Both Amy and Sienna experience the negative event of swallowing water, but Sienna reacts more effectively due to her evidence-based self-talk.

Cognitive-behavioral therapy teaches skills to challenge dysfunctional thoughts like overgeneralization [22]. Athletes who overgeneralize interpret

one negative event as a never-ending pattern, making broad conclusions about themselves and others. While training for a tramping event in New Zealand, Daniel's old knee injury acts up, and he has to cut one practice short. If he thinks, "I'll never be ready for this event. I screw up everything," he is overgeneralizing. One abbreviated training session doesn't mean that he will be ill-prepared for the race, nor does it imply that he fails at *everything* in his life. Such negative thoughts can lead to feelings of anxiety, hopelessness, and irritability, which can then impair training and sport performance [1].

Another classic dysfunctional thinking style is "should" statements. When thoughts like "I should've known better" or "I should beat that athlete" pop up, athletes often become too tense or angry to perform well. Ellis advises us to stop "shoulding" all over ourselves [23]. Instead, use words like "prefer," or acknowledge the facts, such as "Just because I have a better ranking doesn't mean I should beat that athlete. Rankings are meaningless on any given day."

Do self-talk interventions improve sport performance? In a 2011 meta-analysis, Hatzigeorgiadis et al. reported a moderate positive effect size [24]. For instructional self-talk such as "Follow through," fine motor skills like golf putting benefit more than gross motor skills like running. Motivational self-talk ("Just keep swimming") may be more useful for gross motor skills used in endurance sports. Anticipation of positive consequences like "I'll feel wonderful crossing the finish line!" is a type of motivational self-talk helpful in endurance events [25].

Regarding endurance sports, studies find that self-talk interventions have improved performance in swimming [26] and marathon running [25]. Hamilton, Scott, and McDougall found that positive self-talk improved cycling performance, particularly when audio of positive messages reinforced the cyclists' self-talk [27]. The authors also found that negative self-talk slightly improved performance and explained that some athletes perceive negative statements like "You can't keep up this pace" as surprisingly motivating. This study highlights the unique responses of athletes to mental training interventions.

Self-talk interventions do not focus only on challenging negative self-talk but also on brief self-coaching instructions prior to performance. Intelligent athletes may tend to overthink, which can cause muscular tension, hesitation, poor focus, and mental fatigue. Decreased athletic performance may result. Their internal dialogue may sound something like this:

I really want to PR today. Why does *that* athlete have to be in this race? So annoying. Are my water bottles full? Coach told me to get after the third mile. Ooh, I like that guy's bike. How does he afford that? I hope my quad doesn't cramp up. Crap, that work deadline's approaching. What if I don't finish? That'd be awful. Is it going to rain? Remember to pick up milk on the way home. C'mon, focus. PR, baby.

Such rambling self-talk impairs concentration. For increased focus, sport psychologists often teach "trigger words": words or phrases under the athlete's control, about the task at hand, that focus on one thing at a time [28]. Behind the blocks, swimmers might use trigger words like "Fast and loose," "Hop on the third one hundred," or "Do my best." In the above example, Sienna uses trigger words like "Breathe" and "One stroke at a time" to refocus after swallowing water during a swim.

Concentration

Concentration is the ability to focus attention on the task at hand without distraction from irrelevant external or internal stimuli. It is a learned skill of limiting reactions and distractions to unimportant information, which has a profound effect on athletic performance [1, 2]. When athletes concentrate well, they respond to changing performance demands, control emotion and performance state, and release muscular tension [29]. Attentional focus has been theorized to reside on two dimensions: width (broad or narrow) and direction (external or internal) [30]. A broad attentional focus allows a person to perceive several stimuli simultaneously, such as scanning the entire lake prior to the swim. Narrow attentional focus occurs when an athlete only focuses on one or two cues, like a competitor's

tire when making a pass on the bike. An external attentional focus directs attention outward to an object, such as biking toward your specific transition spot. Finally, an internal attentional focus is directed inward to thoughts and feelings, like working through the heavy legs after a bike.

Another important quality of focus is whether athletes associate, i.e., focus on bodily sensations or performance-specific cues, or dissociate, i.e., focus on external stimuli as a means of distracting themselves. Early studies suggested that elite athletes gravitate toward associative strategies, and nonelite athletes favor dissociative strategies, but 35 years of subsequent research has resulted in equivocal findings regarding the best attentional focus for peak performance [31]. Brick et al. recommended future research breakdown associative strategies into active self-regulation and internal sensory monitoring and dissociative strategies into active distraction and involuntary distraction [31].

Additional support for the value of concentration comes from Moran [32]. He contends that a focused state of mind requires deliberate mental effort and intentionality. Although skilled athletes can divide their attention between two or more concurrent actions, they can focus consciously on only one thought at a time. (Focusing on only one thing is also known as the *one-mindful* mindfulness skill.) During peak performance states, athletes' minds are so focused that there is no difference between what they are thinking and what they are doing. Athletes tend to lose their concentration when they pay attention to events and experiences that are in the future, in the past, out of their control, or otherwise irrelevant to the task. Excessive anxiety can also undermine optimal performance by leading performer's focus on inappropriate cues as well as focus too much on conscious, instead of automatic, control of movement. Considered collectively, concentration is a worthwhile mental skill that needs to be deliberately trained and sharpened.

Fortunately there are many supported strategies for improving concentration. Simulating competitive demands in practice can aid with concentration on event day [33]. Simulation offers the opportunity to learn how to cope effec-

tively with distractions and practice strategies for refocusing the mind. Self-talk, especially trigger words, can be used to trigger an identified response. Using nonjudgmental thinking about performance also helps athletes stay in the present moment and not be distracted by past or future performances. (See the section "Mindfulness" for more details.) Performance routines allow athletes to focus on what is under their control and reduce distractions that may come up on race day as well as ready the mind for reaching the zone. Plans for competitions also offer athletes a way to remain focused during the event by reminding themselves of strategies, goals, and techniques. Finally, another strategy to enhance concentration is to overlearn the skills required to perform. Cyclists focus better on race strategy if they aren't overly concerned about how to effectively engage the pedal stroke. A well-learned stroke will be automatic, thus allowing cyclists to focus on other elements necessary for great performance.

Imagery

Imagery is using all of the senses to create an experience in the mind [33]. Imagery, visualization, mental rehearsal, mental blueprint, and mental practice all refer to the process of recalling from memory pieces of information stored from experience and shaping these pieces into meaningful images [34]. It is an act of simulation that occurs internally within the mind. Anyone can use imagery, in any setting, to learn and practice skills and performance strategies, correct mistakes, prepare a mental focus for competition, automate preperformance routines, build and enhance mental skills, and aid in the recovery from injuries [33].

How does imagery work? When engaging in visualization, similar neural impulses occur in the brain and muscles, mimicking those actually fired when physically performing the action [34]. For example, picturing yourself biking up a tough hill will actually fire neurons in your brain and body that are responsible for making your quads and hamstrings move. Imagery also facilitates

performance by helping athletes blueprint the movements or strategies necessary for success, so they become more automatic [34]. For instance, picturing a technically sound swimming stroke increases the likelihood of performing a perfect stroke. Athletes are also able to develop coping responses to potential stressful situations [34]. As such, a cyclist can image racing confidently on a rainy course. Finally, imagery allows athletes to create the optimal levels of energy and concentration required for their performance endeavor [34]. A marathoner who is nervous before a race might picture a beach scene to relax her mind and body.

Evidence supporting the use of imagery in endurance performance has been well-documented. For example, nonathletes using pre-performance imagery of skill execution and successful performance outcomes showed improvement in a 1.5-mile run [2]. In a small group of competitive youth swimmers, imagery training and listening to an imagery script improved performance in a 1000-yard practice set [2]. Another study of a small group of indoor gymnasium triathlon participants showed that imagery helped in the tolerance of pain, increased motivation and confidence, and improved race strategy [3]. These examples, as well as supplemental research involving participants in varying levels of ability and sport type, offer support for the use of mental imagery in enhancing performance.

To set up an effective imagery training program and maximize the potential overlap in neural activation between real and imaged behaviors, it has been suggested to use the PETTLEP model [35]. The PETTLEP model outlines seven elements (Physical, Environment, Task, Timing, Learning, Emotion, and Perspective) that amplify the relatedness between the imaged and actual performance [36]. For instance, the physical element suggests imaging in a similar physical environment (i.e., imaging the swim while standing in the pool or floating in the water). The timing element suggests imaging the performance in real time (note: obviously this may be difficult when imaging endurance sport, though picturing a swimming stroke or run cadence in real time would be ideal). Hence, deliberately engaging in

imagery in ways that best utilize and approximate the elements of the PETTLEP model would offer the greatest benefit [35]. Further, it is essential to assess which aspect of performance that will be imaged [33]. For instance, does the athlete need to focus on technique, dealing with a flat tire, or picturing strength while running up a hill? All require a different type of imagery. Another obvious key to imagery includes being able to control the image [33]. If athletes have difficulty creating the image they want, backtracking to individual behaviors and building off of what they can controllably image are appropriate.

Performance Routines

Throughout this chapter we have introduced mental skills to enhance athletic endurance performance. Though helpful in isolation, these mental skills can serve additional purpose when combined in unison before, during, and after competition. Such deliberate packaging of mental skills to ready the mind and body for a successful performance is known as performance routines. Performance routines are a sequence of task-relevant thoughts and actions systematically engaged in prior to performing a specific sport skill [37]. Though most commonly used in closed-sport situations such as golf putting or free throw shooting, routines also have a place in longer repetitive activities such as endurance sport. In this case, routines would be utilized the night before, the day of, or immediately before competition to prime the athlete for a ready state to perform. In addition, athletes may employ routines *after* performance to aid in their mental and physical recovery.

Performance routines can aid in building confidence, composure, and concentration. For instance, with confidence, every night before a race, a triathlete might eat the same dinner, take time visualizing herself feeling strong the entire race, double check her gear bag, and write positive self-talk statements in her journal. Doing this the night before each race builds confidence for a successful race. An athlete who is prone to performance anxiety or is participating in high-stake

racers might use performance routines to calm his nerves. He may begin race day with a deep breathing exercise prior to leaving for the race venue. He may sit quietly after his swim gear is on and his transition corral is organized. Picturing a calm mind and body throughout the race allows him to maintain composure up until the race begins. Finally, preperformance routines allow athletes to automate their behaviors leading up to race day and start. As such, they are able to focus solely on the race, rather than irrelevant information such as gear, navigating the venue, etc. All the potential stress and mental chatter has been silenced by developing a routine that effectively addresses these areas in an automated manner.

Routines have received substantial support in the empirical literature in a variety of sporting domains [29]. Although routines often occur before or between competitive performances, it is optimal to use them systematically during training so they are learned and easily transferable to competition. Developing appropriate and effective prerace routines may take some time. It is important to use mental skills and routine strategies in a way that fits with the individual. This is not a one size fits all approach. It is necessary to assess what athletes need on race day. What would they like from the routine—confidence, composure, concentration, or all three? What mental skills do the athletes tend to use the most and with the greatest amount of success? Include these skills in the routine. Developing a routine takes time and may require some trial and error. Stay patient and be flexible. Make sure that the components of the routine help enhance performance and not distract from it.

Mindfulness

Mindfulness is experiencing the moment without reacting to the moment [38]. Jon Kabat-Zinn described mindfulness as “the awareness that emerges through paying attention on purpose and nonjudgmentally to the unfolding of experience moment by moment” [39]. It is “affective, compassionate, and nonreactive.” Mindfulness is at the heart of Buddha’s teachings and has been

incorporated in clinical treatments like dialectical behavior therapy [38].

Mindfulness develops an accepting relationship with one’s inner experience, instead of trying to control thoughts and feelings like in traditional cognitive-behavioral approaches [40]. Cognitive models attempt to replace negative thoughts with evidence-based thoughts. In contrast, mindful approaches notice the thoughts without reacting to them. For example, athletes might think, “I’m a failure.” Cognitive interventions encourage the athlete to challenge that belief with evidence like “I didn’t pace the race well but that doesn’t mean I’m a failure in all things—I did succeed by managing my nutrition effectively.” Mindfulness training encourages responses like “I notice the thought ‘I’m a failure’. I’m aware of a tightness in my chest; a feeling of insecurity.”

Interest in mindfulness interventions in sport has increased recently [1]. Control isn’t all it’s cracked up to be, especially when attempts to control backfire. Strategies designed to suppress or replace negative thoughts may paradoxically increase those thoughts [41]. Gardner and Moore argue that traditional mental skills training has reduced negative mental states in some studies but has not translated into consistent improvement in sport performance [40]. Because some athletes struggle to achieve control over their cognitive processes via traditional skills training, acceptance approaches like mindfulness offer promise for the future.

Kabat-Zinn first applied mindfulness to endurance sport performance by studying mindfulness meditation and rowers [42]. More recently, soccer players who trained in mindfulness reported feeling calmer and less reactive to negative emotional states [43]. Thompson et al. found that mindfulness training improved runners’ mile times and feelings of relaxation [44]. The mindfulness training was also associated with decreased anxiety and irrelevant thoughts. One unique study explored the usefulness of mindfulness for recovering from burnout in sport [45].

Mindfulness increases awareness of all things, including experiences of confidence and mastery, which may enhance feelings of flow. Peak athletic

performance is known as being in the zone or in a state of “flow”: the optimal zone where skill meets challenge [46]. Pineau et al. studied mindfulness in rowers and found an association between mindfulness, efficacy, and flow [47]. The authors theorized that mindfulness increased awareness of mastery experiences, thereby increasing feelings of efficacy and flow.

To practice mindfulness skills, endurance athletes might start with observing nonjudgmentally [38]. The *observe* skill involves noticing the present moment without reacting. Athletes may feel stuck in the past when they berate themselves for mistakes or stuck in the future when they worry about the outcome of a race. They can become more anchored in the present by observing with their five senses: “I see the red buoy. I hear the splash of water. I feel coolness on my skin. I notice my breathing is shallow.” The *nonjudgmental* skill is noticing facts without evaluating them as good or bad. Athletes who judge themselves with thoughts like “I shouldn’t get angry” can practice the nonjudgmental skill by listing five facts about the situation (“I *am* angry,” “Everyone feels anger,” “Anger is different from aggression,” etc.) and/or asking what a supportive person in their life would say (e.g., “It’s okay to be angry”).

Balanced Exercise

Exercise has countless physical, mental, and emotional benefits, and endurance athletes know these benefits well. But many people do not exercise at all, and most don’t get enough exercise [48]. There are fewer who get too *much* exercise [49]. Endurance athletes are more at risk for excessive exercise [50], thereby increasing their risk for developing eating disorders and physical injuries [51]. Finding the balance between too little and too much exercise is important for health [48].

Various terms for excessive exercise include compulsive exercise, obligatory exercise, exercise addiction, exercise dependence, and exercise abuse. To manage psychological distress,

exercise joins food restriction, binge eating, substance use, gambling, and other addictive behaviors as a potential means to escape or numb painful emotion. Similar to other compulsive behaviors, excessive exercise provides short-term relief of negative emotional states but often adds to distress in the long run. It can be difficult to detect excessive exercise, particularly in competitive athletes. Think about athletes who run the extra mile or train multiple times a day—others often applaud their unparalleled discipline. For this reason, it may be a challenge to recognize exercise as an addictive, potentially harmful behavior.

How do athletes know if they are overexercising? Powers and Thompson recommend determining if exercise has a negative impact on physical, emotional, or psychological health as well as interfere with daily activities like school, work, or relationships [48]. Exercise is also problematic if it occurs at inappropriate times or settings or continues despite injury. Examples include the compulsion to take a long bike ride in lieu of attending to family needs. The American College of Sports Medicine recommends taking at least one day off exercise per week [52, 53].

The quality of exercise may be more important than the quantity [48]. Qualities to consider include motivation for exercise and level of control over exercise. What motivates athletes to exercise? If the motivation is solely to burn calories, punish themselves, give permission to eat, or compensate for calories eaten, exercise may represent an eating disorder symptom. More balanced motivations include health, training for a sport, stress reduction, fun, and mind-body connection. It’s also helpful to gauge the level of control individuals feel over exercise. If exercise feels compulsive or obligatory, the athlete’s health may be compromised. For instance, cyclists with uncontrollable urges to go on long bike rides experienced more internal conflict [54] (Table 18.2).

Individuals who are concerned about inadequate or excessive exercise will find *The Exercise Balance* by Pauline Powers and Ron Thompson to be a helpful resource.

Table 18.2 Signs of balanced and unbalanced exercise

Signs of balanced exercise	Signs of unbalanced exercise
Improved physical and mental health	Avoidance of all exercise
Supported by adequate nutrition	Exercising without fueling your body
Increased sensation and awareness of body	Obsession with weight and calories burned
Exercise as one of many coping skills for stress	Exercising to allow yourself to eat
Exercise what you like, not exercise what you dislike	Skipping work, class, or social plans for exercise
Balance of cardiovascular, strength, and flexibility exercise	Not taking a day off (even when sick or injured)
Being able to stop when injured	Exercising to compensate for calories eaten
Including leisure activities like hiking	Judging a day as good or bad depending on how much you exercise

Conclusion

The mind of an endurance athlete is a terrible thing to waste. Hopefully this chapter provides an informative introduction into the mental world of sport and how to make the most of what is between the ears to achieve greater performance. Much like the physical and technical training necessary to for endurance sport success, systematic training of mental skills can be difficult and requires tremendous self-discipline. We encourage you to identify the mental skills that interest you most (perhaps imagery, energy management, goal setting, and/or mindfulness) and practice these skills until they become part of you. Start small and have fun along the way!

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