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**Title:** Mindfulness and Emotions in Sport

**Year:** 2021

**Version:** Accepted version (Final draft)

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**Please cite the original version:**

Fink, C., & Ruiz, M. C. (2021). Mindfulness and Emotions in Sport. In M. C. Ruiz, & C. Robazza (Eds.), *Feelings in Sport : Theory, Research, and Practical Implications for Performance and Well-being* (pp. 143-154). Routledge. <https://doi.org/10.4324/9781003052012-16>

**Citation:**

Fink, C., & Ruiz, M. C. (2020). Mindfulness and emotions in sport. In M. Ruiz & C. Robazza (Eds.). *Feelings in sport: Theory, research, and practical implications for performance and well-being*. New York, NY: Routledge.

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## Abstract

Mindfulness involves awareness and acceptance of the inner feelings, including thoughts, emotional responses, and bodily sensations. Several mindfulness-based programs have been developed and implemented also in the context of sports. This chapter outlines the main components of mindfulness as well as the relationship with emotion regulation strategies, provides an overview of scientific literature on the effectiveness of mindfulness-based interventions, and includes guidelines and practical examples for the use of mindfulness-based strategies in a high-performance setting. Research evidence has provided support for the use of mindfulness-based interventions to help athletes self-regulate and improve performance.

24

**Introduction**

25

The key, though, is being aware of how you are feeling and how you need to be

26

feeling. It all starts with awareness...I never had a set routine, an ironclad

27

formula that I practiced night after night. I listened to my body and let it inform

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my warmup, because there are always variables. If I felt the need to shoot extra

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jumpers, I'd shoot more. If I felt the need to meditate, I'd meditate.

30

Bryant (2018)

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An athlete's present moment awareness as well as sustained task-relevant attention

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are pre-requisites for an optimal performance. In competitive sport, however, many factors

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such as the crowd noise, opponents' actions, fear of failure, or thoughts about anticipated

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success constitute obstacles for athletes' sustained attention. For the past three decades,

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mindfulness training has received growing interest for its potential to reduce psychological

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distress and promote self-regulated behaviours (Brown, Creswell, & Ryan, 2015).

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Mindfulness training has been applied to sports with the purpose of helping athletes develop

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non-judgmental awareness and improve performance (Corbally, Wilkinson, & Fothergill,

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2020; Noetel, Ciarrochi, Van Zanden, & Lonsdale, 2019). In this chapter, we (a) consider the

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conceptualization of mindfulness and related relevant theoretical approaches for the

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regulation of feeling states, (b) overview mindfulness-based theoretical frameworks and the

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main components of these approaches, (c) present existing empirical evidence on the

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effectiveness of mindfulness-based interventions as they relate to emotion regulation and

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sport performance, and (d) conclude with specific examples of mindfulness-based

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interventions conducted with an Olympic level athlete.

## 46                                    **Theoretical Considerations**

### 47    **Conceptualization of Mindfulness and Emotional Regulation**

48            The concept of mindfulness originates from ancient Buddhist spiritual practices that  
 49    people engage in with the purpose of cessation of personal suffering and the promotion of  
 50    well-being. Jon Kabat-Zinn introduced mindfulness—as a strategy for self-regulation—to  
 51    Western psychology, with a mindfulness-based stress reduction program originally developed  
 52    for the treatment of chronic pain in patients with terminal illnesses (Kabat-Zinn, Lipworth, &  
 53    Burney, 1985; Kabat-Zinn, 1990). Kabat-Zinn (1990) reported using mindfulness strategies  
 54    with the United States Olympic men’s rowing team back in 1984, and with the Chicago Bulls  
 55    and Los Angeles Lakers.

56            Mindfulness has been defined as paying attention in a particular way: *on purpose,*  
 57    *nonjudgmentally, and in the present moment* (Kabat-Zinn, 1990); “*a process of regulating*  
 58    *attention in order to bring a quality of nonlaborative awareness to current experience*  
 59    *within an orientation of curiosity, experiential openness, and acceptance*” (Bishop et al.,  
 60    2004, p. 232). Mindfulness involves present-moment awareness or paying attention to the  
 61    inner feelings, including thoughts, emotional responses, and bodily sensations, as well as an  
 62    accepting, open, and non-judgmental attitude, with the purpose of reducing cognitive  
 63    vulnerability to reactivity, which may result in emotional distress (Bishop et al., 2004; Farb,  
 64    Anderson, Irving, & Segal, 2014). In sport settings, mindfulness, “*as a specific way of paying*  
 65    *attention (in the present, on purpose, and with acceptance), offers a map, a guide, and a*  
 66    *compass to approach this territory of performance*” (Haberl, 2016, p. 212).

67            This conceptualization of mindfulness provides an alternative view of emotion  
 68    regulation, which involves the individuals’ efforts to initiate, maintain, or modify the type,  
 69    intensity, and duration of emotions experienced and how they express these emotions (Gross,  
 70    2014; Peña-Sarrionandia, Mikolajczak, & Gross, 2015). Mindfulness promotes awareness

71 and acceptance of internal states, which are critical aspects for self-regulation (see Ruiz,  
72 Bortoli, & Robazza, 2020). However, mindfulness does not imply any effort to control over  
73 emotion experience or expression. Unlike emotion regulation, which includes strategies such  
74 as withdrawal from aversive emotional experiences or expressive suppression, mindfulness  
75 promotes the experience and expression of emotions regardless of their content, intensity, or  
76 perceived valence (Moore, 2016). The purpose of mindfulness-based practice is to help  
77 athletes change the way they view cognitive content as something natural and temporary,  
78 rather than statements of fact (Gardner & Moore, 2007). By observing their inner experiences  
79 with a non-judgemental attitude, athletes may be able see thoughts as thoughts and feelings as  
80 feelings separating themselves from them, a concept called *cognitive defusion*, and engaging  
81 in non-reactivity to inner experiences (Hayes, Strosahl, & Wilson, 2012). Mindfulness  
82 promotes awareness of regulatory habits, which may enhance regulation by increasing  
83 flexibility in strategy selection. In addition, mindful attention and acceptance may lead to the  
84 reduction of dysfunctional emotional patterns, for instance, by helping athletes acknowledge  
85 and limit rumination or rehearsal of negative emotional triggers, thereby freeing cognitive  
86 capacity (Farb et al., 2014).

87

## 88 **Mindfulness and Sport Performance**

89       Theoretically, mindfulness and acceptance may be associated with reduced ironic  
90 rebound effects resulting from the desire to suppress dysfunctional thoughts and feelings  
91 (Wegner, 1994) and reinvestment occurring when athletes shift their attention to skill  
92 execution (Baumeister, 1984), both of which are detrimental for performance. In addition,  
93 previous research in rowers has demonstrated an association between dispositional  
94 mindfulness (i.e., tendency to be mindful) and experiences of flow (Pineau et al., 2014),  
95 which are intrinsically enjoyable experiences characterized by complete focus on the task and

96 merging of action and awareness among other characteristics (Csikszentmihalyi, 1990).

97 Another concept related to mindfulness is association or the strategy in which

98 athletes, especially long distance-runners, pay close attention to their bodily sensations in

99 order to optimize performance (Salmon, Hanneman, & Harwood, 2010; see also Raglin,

100 Hettinga, & Shei, 2020). Röthlin et al. (2016) conducted a cross sectional study with 133

101 competitive athletes and found a negative relationship between mindfulness and competitive

102 anxiety, and a positive association with perceived ability to perform in demanding situations.

103 In addition, Josefsson et al. (2017) conducted cross sectional and longitudinal studies

104 involving 242 young elite athletes and 65 elite athletes, respectively, and found a negative

105 association between dispositional mindfulness and the athletes' reported difficulties to

106 regulate unpleasant emotions.

107 Several mindfulness-based programmes have been developed to help athletes increase

108 mindfulness disposition or other characteristics related to athletic performance. For instance,

109 the mindfulness-based stress reduction program includes mindfulness meditation (i.e.,

110 systematic cultivation of present-moment awareness of inner experiences; Kabat-Zinn, 1990);

111 the mindfulness-acceptance-commitment approach (Gardner & Moore, 2007) adopts the

112 principles from acceptance and commitment therapy; the mindful sport performance

113 enhancement program (Kaufman, Glass, & Pineau, 2016) includes elements of mindfulness

114 meditation to help athletes increase flow-like experiences; and the mindful meditation

115 training for sport 2.0 (Baltzell & Summers, 2018), which integrates the concept of self-

116 compassion (i.e., the desire to free oneself from suffering) to help athletes deal with

117 competitive anxiety and self-criticism. Preliminary empirical evidence exists on the

118 effectiveness of mindfulness-based interventions to enhance flow in archers and golfers

119 (Kaufman, Glass, & Arnkoff, 2009), and university athletes (Aherne, Moran, & Lonsdale,

120 2011).

121           There are several reviews of literature on the benefits of enhanced awareness and  
122 attentional capacity associated with mindfulness practice in athletic populations. Sappington  
123 and Longshore (2015) conducted a systematic review of 19 empirical studies using  
124 mindfulness, including single-case studies, qualitative studies, nonrandomized trials, and  
125 randomized trials of athletes from different sports. Taken together, their review provided  
126 preliminary support for mindfulness-based interventions in improving performance. In a  
127 review of nine trials including 290 athletes from various sports, Bühlmayer, Birrer, Rothlin,  
128 Faude, and Donath (2017) showed mindfulness-related interventions having positive effects  
129 on mindfulness, physiological and psychological variables (e.g., salivary cortisol level, flow,  
130 and anxiety), as well as performance in precision sports (e.g., shooting, darts). In a review of  
131 66 studies including 3908 athletes, Noetel, Ciarrochi, Van Zanden, and Lonsdale (2019)  
132 found some support for the effectiveness of mindfulness and acceptance-based interventions  
133 on dispositional flow, competitive anxiety, and performance enhancement. They also found  
134 preliminary support for the use of mindfulness and acceptance-based interventions to prevent  
135 injuries, reduce burnout, and increase confidence. Finally, in a systematic review of seven  
136 studies including 266 long-distance runners, Corbally et al. (2020) found small to moderate  
137 effects of mindfulness-based interventions for reducing competitive anxiety and effort  
138 perception.

139           Overall, there is empirical evidence demonstrating that mindfulness-based  
140 interventions can influence relevant factors that have an impact on athletic performance.  
141 Findings also highlight possible avenues for future research, including potential health  
142 benefits such as the reduction of burnout, prevention and management of injuries, and  
143 management of dysfunctional emotional eating (see also Devonport, Nicholls, & Chen-  
144 Wilson, 2020). The existing body of literature, however, reflects the need for more rigorous  
145 research designs such as randomized control trials.

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### **Applied Recommendations**

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#### **Initial Evaluation and Awareness**

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In the following section, we provide applied recommendations for the use of mindfulness-based strategies in the optimization of performance. The process may involve the following steps: (1) initial evaluation and awareness, (2) promoting acceptance of pleasant and unpleasant performance related experiences, and (3) commitment to remain focused on task-relevant aspects. We illustrate this procedure with examples from actual interventions implemented by the first author in the optimization of performance of a 28-year-old male athlete competing at Olympic Games (to protect the athlete's anonymity we do not indicate the type of sport). Based on her 25 years of experience working with athletes competing at the highest level (i.e., Olympics, World Championships), she has observed that athletes who usually achieve the best results are those who are not afraid of dealing with their emotions, are able to be mindful, experience self-doubt and can live with it.

The first step involves an initial evaluation and the identification of experiences associated with performance. Recalling past performances and associated experiences helps athletes increase awareness about their own experiences and the influence these have on performance. Practitioners may use instruments (e.g., individualized profiling procedures, see Ruiz et al., 2020) to help athletes accurately describe such experiences. In the case here described, the practitioner asked David (pseudonym) to think back to training sessions and competitions when he performed really well. He was asked to recall how he felt prior to such performances including bodily sensations such as heart rate or breathing (e.g., was the pattern quicker or slower than usual?), and energy level. David identified several labels that provided



170 information about activation (i.e., high vs. low) and hedonic tone (i.e., pleasant vs.  
171 unpleasant). Figure 1 displays the words David identified.

172 [INSERT FIGURE 1 HERE]

### 173 **Promoting Acceptance of Inner Experiences**

174 The second step involves the normalization of unpleasant experiences and promotion  
175 of an accepting attitude. Some athletes assume that only pleasant states such as confidence  
176 are associated with excellent performance. In contrast, athletes may experience a combination  
177 of pleasant and unpleasant experiences. For instance, David pointed out an existing struggle  
178 when dealing with his emotions arousing from his confrontation with the coach while  
179 receiving feedback during training. Thus, the goal of the first sessions was to discuss the  
180 importance of becoming aware of his feelings during training and competitions, accepting the  
181 experience of unpleasant emotions rather than avoiding or trying to control them, recognising  
182 the own useless reactions to coach feedback and let go of the emotions he experienced at the  
183 moment.

184 After a couple of sessions, David was open to discussing his emotions and bodily  
185 sensations, and he revealed that he felt really anxious in preliminary rounds. Once he made it  
186 to the final, he would feel more confident and in control, however, the preliminary rounds  
187 where incredibly stressful for him. He opened up about having self-doubts and sometimes  
188 experiencing nausea because of pre-competition anxiety. Then, the goal was to make him  
189 understand that Olympic Games can be a roller coaster of emotions and to highlight the need  
190 to mindfully “accept the ride” as opposed to falling into the trap of trying to avoid or deny the  
191 own feelings (Fink-Sisniega & Haberl, 2005). He was asked to remember how he felt prior to  
192 his good performances in the previous Olympics, and to identify how he would like to feel  
193 and what actually worked for him in competition.

### 194 **Regaining Focus**

195 To help David prepare for what he would experience, he was involved in self-  
196 awareness activities and then presented with different scenarios. The focus was on  
197 anticipating and dealing with the own possible reactions, and regaining attention or choosing  
198 where to direct attention. At first, he was instructed to direct his attention to different parts of  
199 his body and monitor the level of activation or relaxation (“body scan”). He was also asked to  
200 notice his inner thoughts and emotional reactions. The goal was to help him understand the  
201 importance of being aware of his feelings and making the decision on whether to act or not  
202 upon those feelings and thoughts. Once David opened up to explore these situations, he  
203 became aware of the different sensations he had and the thoughts and feelings that would  
204 come up. David was very descriptive with how he felt:

205

206 *Before the competition, you are trained, prepared, strong...your mind goes to fear of*  
207 *making mistakes, and starts reviewing all the possible things that could go wrong...*  
208 *your body tightens, your attention narrows, your breathing gets faster and superficial*  
209 *and that causes your heart to beat faster. You react as if the bad outcome is already*  
210 *happening and that makes you more likely to mess up.*

211 David improved his awareness of different physiological responses, including  
212 increased heart and breathing rate, sweaty palms, muscle tension, stomach issues, as well as  
213 cognitive responses, such as rumination, jumping from thought to thought, ineffective  
214 attention pattern. He also became aware of sources of distraction, such as thoughts about the  
215 past (e.g., mistakes or celebrating anticipated success too soon) or the future (e.g., “if I do  
216 this” or “if I miss this”), lack of clarity (e.g., mechanical analysis or trying to focus on too  
217 many things at once), or negative bodily sensations (e.g., muscle fatigue, pain, heat or cold).

218 Table 1 presents an exercise that helped David identify his experiences, thoughts,  
219 behaviours, and the consequences of these, before, during, and after past competitions. The

220 goal was to help David recognize possible automatic thoughts and responses, and to develop  
221 a plan of action to redirect the focus of attention on the task at hand. David was trained in  
222 making the distinction between *a time to think* and *a time to act*. Once ready to perform, he  
223 developed specific cue words or short sentences to regain focus on main action he needed to  
224 take (e.g., push, explode, stay low...) or an area to pay attention to (e.g., hips, eyes). He was  
225 reminded of the relationship between inner experiences and performance, the importance of  
226 letting go of unpleasant emotions, and to focus on aspects of his performance he could  
227 control.

228 [INSERT TABLE 1 HERE]

229 In the next step we analysed and developed a plan to deal with stressful situations. A  
230 series of potentially stressful situations were identified together with David's responses,  
231 thoughts, typical behaviours, and ways to respond more effectively (see Table 2). The initial  
232 list included 50 situations. David developed personal strategies to be incorporated into  
233 flexible routines for adaptation to specific situations (as Kobe Bryant's quote highlights in the  
234 chapter introduction). Most of the anticipated stressful events were then perceived as part of  
235 the process and therefore no longer stressful. This work went on for several months before  
236 the Olympics and continued for several years, which led David to participate in the next two  
237 Olympic Games.

238 [INSERT TABLE 2 HERE]

239 Discussing the experience of other athletes involved in similar potentially stressful  
240 events was helpful to David. The example of the soccer player Brandi Chastain was  
241 particularly useful. In her account of the World Cup final she provided an example of the  
242 thoughts that can creep up on athletes when they least expect it:

243

244 *We walked through the shadowy tunnel at Giant's Stadium in New Jersey for the*  
245 *opening game and stepped out into the bright sunlight. A huge roar burst from the*  
246 *capacity crowd. The flashing of thousands of cameras exploded before our eyes, and*  
247 *the smell of fresh-cut grass was heavy in the air. It was all finally happening. As I*  
248 *stood there, arm in arm with Kristine Lilly, I was flooded by a rush of anxiety. Oh my*  
249 *God, I have to perform, I realized. I was paralyzed with thoughts I had never had*  
250 *before on a soccer field. What if I can't hold up my end? What if I don't live up to the*  
251 *expectations of my teammates, or myself? I was overwhelmed by the enormity of the*  
252 *game, the culmination of all the planning, training, and waiting. There was even talk*  
253 *that if the U.S. Team didn't win the tournament, the event would be a failure and not*  
254 *live up to its promise to prove women's soccer was worthy of attention. I actually*  
255 *began to shake. (Chastain, 2004, p. 175)*

256

257 Brandi goes on to explain how they had worked as a team on what they would focus  
258 on and how to filter what they could not control. Examples like this may be used to help  
259 increase athletes' perceived self-efficacy.

260 In summary, at the beginning of the consultancy work, David was unsatisfied with the  
261 way he was responding to the feedback of his coach and how he was feeling in certain  
262 competitions. The intervention helped him increase awareness of the own thoughts, feelings,  
263 and behaviours, deal with the experience of unpleasant emotions, and focus attention to the  
264 present moment.

265

### **Conclusion**

266 Mindfulness-based interventions aim to develop present moment awareness and  
267 acceptance, with the goal of helping individuals deal with their inner experiences. For the  
268 past thirty years, there has been a growing interest in the application of mindfulness as well

269 as researching the effectiveness of such interventions for the optimization of athletes'  
270 performance and well-being. Several mindfulness-based approaches have been developed in  
271 the context of sports. Preliminary empirical evidence provides support for the use of  
272 mindfulness-based interventions, although further research is warranted. The chapter  
273 provides practical guidelines for the use of mindfulness-based interventions and an actual  
274 case to exemplify the process. The main aspects of the mindfulness-based intervention  
275 presented involve awareness of inner experiences, understanding of the impact of  
276 experienced emotions, normalizing the experience of unpleasant emotions, learning to  
277 perform despite experiencing unpleasant emotions, being accountable for own feelings,  
278 actions, and performance in training and competition.

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369

370 Table 1

371 Analysis of actual David's experiences, behaviours, and consequences

372

Situation	I feel	I think	I do	Consequences are
The day before competition, in training	Very relaxed	Everything will go as planned I could mess up	Focus on what I can control and manage Since I am a little anxious, I do my breathing exercise and let the thoughts go by	I feel good and confident
The night before	A little restless	I should not worry about it	Do a relaxation exercise and focus on my breathing	I fall asleep
When I wake up	Excited, nervous, ready	Finally!! I want to get to the competition I feel butterflies	Do a mental check of what I need to do to get ready	I feel like I got this
When I get to the competition	Anxious	I want everything to go as planned and start focusing my attention on what I want to do	Get myself situated	I feel ready even though I am a little stressed
At warmups	Activated	I want to have a good warmup and I know what I need to do I am making sure I pay attention to what I want rather than what I think and feel	Focus on every movement at first and then I trust myself and just let myself go	I am ready even though I am anxious
During the competition	Energized, focused, activated, in the zone	Not thinking that much, just visualize myself doing well and then let things happen Refocusing when I need to	Let myself perform, and use my refocusing cues when I need to	I end up doing well because I trust myself and I don't overthink it
After the competition	Relieved, happy	I need to do this more often	Evaluate how I did and why	Learn from this competition

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375 Table 2

376 Anticipated potentially stressful situation, David's experiences, behaviours, and

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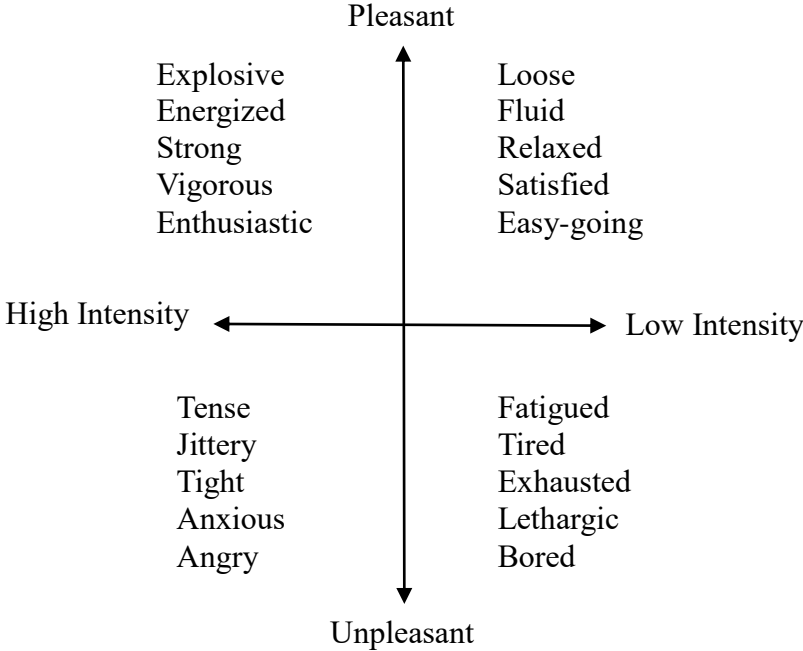
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Possible stressful situation	What do I think and feel	What do I do	What will I do
When the coach gives me feedback I don't agree with	I think he is wrong and doesn't understand what I need. I get frustrated	I argue and defend why I am doing things the way I am doing them	I will listen to the coach and incorporate the information I am given
When I am getting angry with the way training is going	I start thinking about how I would rather not have so many distractions I get angry and at times lose my focus	I either refocus and can get on with it or I get angry and can't focus as well	I will be aware of what I am feeling and I will choose to focus on my training
When I am not feeling 100%	I feel like I am not going to perform as well	I have learned to focus on what I have and focus on what I can do that day	Continue focusing on what I can control or manage
When I feel I am not getting better	I start thinking of how much time I have put into this and I feel frustrated	I go back to focusing on small gains and focusing on the process	Continue to focus on small gains and trusting the process
Social media and interviews	Overwhelmed, I am a private person and don't like social media, I keep it to a minimum because it stresses me out	I try to avoid it and try to leave before I get interviewed and ask to the minimum required	I can make a plan to handle this better. I can't avoid it, so if I embrace it, I could learn to handle it better
When they distract my coach	I get very annoyed	Talk to my coach to get what I need	Talk to my coach so that we are both on the same page dealing with distractions
When I don't understand what the coach is asking of me in video sessions	Try to listen but have a hard time, I get distracted and start daydreaming	I try to refocus and listen	Make sure I talk to the coach after the session

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380 *Figure 1.* David's experiences associated with performance

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