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Multilevel Model of Sport Injury (MMSI):

Can Coaches Impact and be Impacted by Injury?

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Introduction

Psychology of sport injury is a field of research that emerged almost five decades ago (Little, 1969). Evolving from a synthesis of sport psychology, behavioural medicine, and sports medicine (Heil, 1993), it had two main objectives at its inception: to predict and prevent sports-related injuries and provide adaptive psychological strategies to assist recovery following injury. Given that injury is often considered part and parcel of competitive sport and that rehabilitation from injury can be a challenging ordeal for many athletes (Wadey & Evans, 2011), it is unsurprising that research within this field gained increased momentum in the 1970s, 1980s and 1990s. An example of the wealth of research that emerged during this time frame is perhaps best illustrated by the special edition dedicated to the psychology of sport injury in the *Journal of Applied Sport Psychology* in 1998. Collectively, the published articles within this special edition provided a comprehensive theoretical, methodological and applied overview of the literature. For example, Williams and Andersen (1998) proposed the multi-component theoretical model of stress and injury and Wiese-Bjornstal, Smith, Shaffer, and Morrey (1998) proposed the integrated model of psychological response to the sport injury and rehabilitation process; both of which are still being used to inform research and practice today.

In the 21st Century, research into the psychology of sport injury has continued to flourish and diversify. The increased volume of research can be evidence from the numerous books (e.g., Arvinen-Barrow & Walker, 2013; Brewer & Redmond, 2016), review articles (Brewer, 2010; Ivarsson, Johnson, Andersen, Tranaeus, Stenling, Lindwall, 2017; Ivarsson, Tranaeus, Johnson, & Stenling, 2017; Levy, Polman, Clough, & McNaughton, 2006; Wiese-Bjornstal, 2010), and the introduction of new models and theories (Brewer, 2010; Brewer, Andersen, & Raalte, 2002; Roy-Davis, Wadey, & Evans, 2017). For example, Brewer et al. (2002) introduced the biopsychosocial model of sport injury rehabilitation with a rationale to help bridge the gap between medical and psychological approaches to sport injury

rehabilitation, and to incorporate the myriad of factors that contribute to sport injury rehabilitation outcomes. Yet, aside from these significant advancements, a critical perusal of the psychology of sport injury literature reveals a predominant lens on the injured athlete. That is, the focus is either on explaining whether an athlete's psychological response to a demanding athletic situation can predict or prevent injury or understanding an athlete's responses to and rehabilitation from injury. Yet, few researchers have explored beyond an intrapersonal perspective; failing to consider other levels of analysis that may impact and be impacted by injury (for notable exceptions, see Bianco & Eklund, 2001; Mankad, Gordon, & Wallman, 2009; Cavallerio, Wadey, & Wagstaff, 2016; Martinelli, Day, & Lowry, 2016; Salim & Wadey, 2018). Indeed, Brewer et al. (2002) recognised, "Sport injury rehabilitation does not occur in a vacuum. Rather, it happens in a particular situational and environmental context that can affect psychological aspects of sport injury rehabilitation" (p. 49).

The aim of this chapter is twofold: First, to introduce a new conceptual model: *Multilevel Model of Sport Injury* (MMSI; Figure 1). The MMSI extends current theorising by recognising and accounting for diverse units of analysis that are proposed to impact and be impacted by sport injury. The MMSI is not intended to detract from the study of injured athletes at an interpersonal level, quite the contrary, but to reflect the wealth of social-organisational-cultural factors that might help to provide a more critical, nuanced, and holistic understanding of sport injury. Drawing from contemporary research, the second aim is to provide a population-specific example of the MMSI that critically examines two pertinent questions: Can coaches impact sport injury? Can coaches be impacted by sport injury? Future avenues of research are then discussed that shift the focus away solely from the injured athlete to account for the complex, dynamic, and multifaceted nature of sport injury. The chapter concludes with practical implications that can be debated in professional development courses to question, challenge, and refine coaching practice.

Multilevel Model of Sport Injury

[Insert Figure 1]

The MMSI proposes five distinct, yet relational levels of analysis: intrapersonal, interpersonal, institutional, cultural, and policy. Before describing each of these levels however, it is firstly important to explain why the psychology of sport injury literature needs yet another new conceptual model. First, the MMSI extends current theorising by proposing five distinct, yet relational levels of analysis that are proposed to impact and be impacted by sport injury. Current theories and models do not distinguish between these units of analysis. For example, Williams and Andersen's (1998) multi-component theoretical model of stress and injury, Wiese-Bjornstal et al.'s (1998) integrated model, and Brewer et al.'s (2002) biopsychosocial model, all collapse situational variables together (e.g., 'potentially demanding athletic situation', 'situational factors' or 'social-contextual factors' respectively), ignoring how these variables may operate at multiple levels. Second, the MMSI provides a platform for future research by illustrating how injury is influenced at multiple levels (and vice versa). Researchers can use the MMSI to formulate hypotheses or research questions at one or multiple levels. Importantly, the MMSI can also accommodate additional models and theories. For example, Bowlby's (1969) attachment theory could be used to inform research at an intrapersonal level; Cohen and Wills (1985) buffering model at an interpersonal level; Fletcher and Fletcher's (2004) meta-model of stress, emotions and performance at an institutional level; and Frank's (2013) narrative inquiry at a cultural level. Finally, MMSI provides a useful framework for policy-makers (e.g., Department for Digital, Culture, Media & Sport in the United Kingdom), institutions (e.g., Sport England) and various personnel (e.g., coaches, doctors, physiotherapists) to target their interventions. However, it is important to note that the levels of influence are interdependent and can affect one another. Thus, an intervention directed at one level can have knock-on effects at other levels.

To reiterate, there is currently an over emphasis at the intraindividual unit level of analysis in the psychology of sport injury literature. We believe the broader environment needs to be considered to further contextualise the wider social-organisational-cultural influences and the web of relationships with significant others that impact the sport injury process. To illustrate, Wiese-Bjornstal (2009) reported, "Injury affects more than the injured; it often also holds health-related consequences for the network of family, friends, teammates, coaches staff and even the larger communities" (p. 64-65). Specifically, the MMSI proposes five distinct, yet relational levels of analysis. The first level, *Intrapersonal*, reflects the characteristics of the individual (e.g., age, gender, ethnicity, social-economic status, values, beliefs, attitudes, motives, coping styles) and his or her thoughts, feelings, and behaviours prior to and/or following injury. A significant body of research supports this level of analysis, which targets athletes' responses prior to (e.g., attentional responses) and following (e.g., cognitions and emotions) injury (for reviews, see Brewer, 2010; Ivarsson et al., 2017). Importantly, the MMSI can also be expanded to include individuals other than athletes and injuries that do not occur in sport. For example, Didymus (2016) identified that coaches also experience injuries, and Hargreaves and Waumsley (2013) examined the psychology of physical activity-related injuries. These avenues warrant future research attention.

The second level of analysis, *Interpersonal*, focuses on formal and informal social networks and support systems. Examples of interpersonal factors include social support, others' attitudes towards sporting injuries, and social processes (e.g., leadership, team dynamics, dyads, roles). Existing research at this unit of analysis has typically focused on the concept of social support and how support providers (e.g., coaches, teammates, physiotherapists) can best meet the needs of the injured athlete (e.g., Corbillon, Crossman, & Jamieson, 2008; Malinauskas, 2008). However, research at this level has predominately been one-directional in nature (i.e., interindividual to intraindividual). What researchers have not

fully considered yet is how sport-related injuries can impact one's support network and how we can support the well-being of injured athletes' support networks to enable them to function effectively. Concepts such as vicarious trauma and vicarious growth are likely to be salient here (Day, Bond, & Smith, 2013; Martinelli et al., 2016). In addition, certain individuals and relationships or dyads have received limited research attention. For example, there is a significant wealth of research exploring the coach-athlete relationship in sport psychology. Yet, the physiotherapist-athlete relationship has by-in-large been ignored (for a notable exception, see Heaney, Walker, Green, & Rostron, 2014).

The third level, *Institutional*, is concerned with the sport (e.g., type, level, norms, values), institutions and organisations (e.g., strategy, functioning, climate), physical environment (e.g., material provisions), psychosocial architecture (e.g., player welfare, key stakeholder relationships), and injury protocols (e.g., screening, surveillance, services). This unit of analysis has received less research attention in comparison to the previous two levels. Examples include the norms and values of the sport and how they influence overuse injuries (Cavallerio et al., 2016), how the rehabilitation environment can affect injured athletes' rehabilitation adherence (Niven, 2007), and recommendations for screening and surveillance (Wiese-Bjornstal, 2009). This unit of analysis represents an exciting area for future research, especially considering its significant scope to inform professional practice. The fourth level, *Cultural*, reflects the media, cultural narratives, and collective norms, traditions, and values. This unit of analysis is best reflected by drawing on the work of Brett Smith and Andrew Sparkes (2002, 2004, 2005) who have explored the stories of athletes who suffered a spinal cord injury through sport. Their research illustrates how former able-bodied participants drew upon and built their own stories based on the narrative resources (e.g., chaos, restitution, and quest) that their culture made available to them. Furthermore, these stories did things on, in, and for them. Importantly, narratives not only circulate in larger abstract social-cultural

environments, but also in physical locations such as rehabilitation clinics and sporting organisations. In addition, the media has a critical role in supporting specific narratives while disregarding and silencing others in sport (Carless & Douglas, 2013). Indeed, Wiese-Bjornstal (2009) reflected her dissatisfaction with how popular press magazines around the time of the 2008 Summer Olympics depicted athletes as 'machines' rather than people with minds, souls, and spirits. This unit of analysis represents an under researched area within the psychology of sport injury literature and has significant scope for future research.

Policy is the final level of analysis. That is, local and national policies. To illustrate, the Minister for Sport from the Department of Digital, Culture, Media and Sport in the United Kingdom requested an independent report to Government by Baroness Grey-Thompson (2015) into the Duty of Care sport has towards its participants. One of the themes within the report of relevance is 'Safety, Injury and Medical Issues'. Consequently, the report considers how the likelihood of injury could be lessened and whether improvements can be made to how sporting injuries are treated in the short and long term. Recommendations for this theme and others (e.g., 'Mental Welfare') are put forward that have implications that are directed at various levels: intra/interindividual level (e.g., "Staff, coaches, and athletes to receive mental health awareness training and support, which should be included as part of induction processes as well" p. 32), institutional level (e.g., "NGB [National Governing Bodies] to strengthen links with NHS [National Health Service], mental health teams, mental health charities, and community groups. Links should also be considered through UK sport and Sport England" p. 32), and policy level (e.g., "Governments should consider the potential for an insurance scheme that all sports buy in to that covers catastrophic injury" p. 33). Implementing these recommendations will ultimately have important implications at a cultural level. This report clearly provides a powerful illustration of the different units of analysis posed in the MMSI and how interventions can be targeted at each. Looking towards the future, it is now important

that researchers examining the psychology of sport injury literature strive to operate beyond personal agency. By only focusing at an intrapersonal level it promotes a neoliberal health role, which calls on the athlete to be a responsible citizen who must personally take care of his or her health (Smith & Perrier, 2014). This perspective ignores social responsibility. Indeed, we do not just need to make athletes more 'mentally tough' and 'resilient', we also need to ensure that policies and practices are put in place the support their safety, well-being and welfare. The MMSI provides a framework as to how this might be done in practice.

Can Coaches Impact Sport Injury?

To bring the MMSI to life and to illustrate how it might work in practice, this subsection aims to critically examine the following question: *Can coaches impact sport injury*? In doing this we concentrate on the prediction and prevention of sport injury, with a specific focus on the impact of the coach. To date, this area of research has largely been guided by Williams and Andersen's (1998) multi-component theoretical model of stress and injury. The model suggests that an athlete's response (i.e., cognitive appraisals, physiological/attentional changes) to a potentially demanding athletic situation directly leads to injury. Three factors are proposed to impact an athlete's response: personality, history of stressors, and coping resources. To illustrate, if an athlete has a history of many stressors (e.g., relationship breakup with partner, death of a close family member), possesses a personality trait that does not regulate stress effectively (e.g., competitive trait anxiety), and has few or inappropriate coping strategies (e.g., ineffective social support exchanges), it will intensify their response to a stressful athletic situation and increase the likelihood of injury. Many of the fundamental tenets of this model have received empirical support (e.g., Maddison & Prapavessis, 2005; Wadey, Evans, Hanton, & Neil, 2013). Yet, this model by-in-large operates at an intrapersonal perspective. Rather than reviewing research at this unit of analysis here (see Ivarsson et al., 2017), the purpose of this subsection is to synthesize research targeting units of analysis that operate above and beyond

an intrapersonal perspective. Underpinned by the MMSI and informed by contemporary research, the aim of this section is twofold. The first subsection, *An Interpersonal Perspective*, aims to critically examine the association between coaching practice and injury. The second subsection, *An Institutional and Cultural Perspective*, aims to critically reflect on the social-cultural-organisational environment and how this might impact coaches' actions.

An Interpersonal Perspective

Coaching philosophy is a central plank in understanding a coach's behaviour (Lyle & Cushion, 2017). Indeed, it underpins practice and is made up of a collective of values, beliefs, assumptions, attitudes, principles and priorities (Lyle, 2002). Thus, what coaches do and how they behave is shaped by their individual coaching philosophy. For example, Lyle (1999) used content analysis to identify the coaching philosophies of 43 senior coaches, which included 24 values common to all 43 coaches (e.g., personal growth, respect for others, partnership, self-improvement, professionalism, openness, and supportiveness). These values, Lyle argued, underpin beliefs and practices that, in turn, characterise coaching practice. Yet, while coaching practice in sport has received significant empirical attention (see e.g., Lyle & Cushion, 2017; Potrac, Gilbert, & Denison, 2013; Thelwell, Harwood, & Greenlees, 2017), few researchers have examined its impact on injury (for notable exceptions, see Cavallerio et al., 2016; Krane, Greenleaf, & Snow, 1997; Roderick, Waddington, & Parker, 2000).

In 1997, Krane et al. used a case-study approach that provided a powerful illustration of how coaching practice led to serious injuries in an American former female elite artistic gymnast. From reading and interpreting the identified themes, corresponding narrative and verbatim quotes, the gymnast's coaches' beliefs and actions can be identified, thereby providing insights into coaching philosophy. Beliefs were winning at all costs, ends justify the means, sport demands intense commitment, success is measured by winning, self-worth is

based on athletic performance, and the products of coaching outweigh the process. Examples of these beliefs-in-action included coaches insisting on participation in practices when injured, demanding complete compliance to extreme training regimes, rewarding unyielding dedication to achieving physical perfection, using punishment if perfection is not attained, and engaging in unhealthy practices. For example, the gymnast described one technique used by one of her coaches, "[She would] place bottle caps on the bottoms of your feet, if you fell on your heels off of the balance beam, then you would have them, the Pepsi bottle caps, go into your heels." (p. 59). These beliefs and resultant actions taken by her coaches led the gymnast to suffer many serious injuries. Yet, despite medical personnel recommending that she ceases participation, medical concerns were disregarded by her coaches. After all, the gymnast was led to believe that these excessive training techniques were a necessary aspect of performance in elite sport and that her coaches were the gate keepers to advancing in her gymnastics career. However, while this study illuminates how coaching practice can lead to injury, it is important to acknowledge that only the gymnast's perspective was considered; the researchers failed to report the coaches' point-of-view.

The aforementioned coaching practices have been observed to resonate in other sports: rhythmic gymnastics (Cavallerio et al., 2016), professional golf (Douglas & Carless, 2009), basketball (Papathomas & Lavellee, 2014), Australian football (Coulter, Mallett, & Singer, 2016), and swimming (McMahon & McGannon, 2017). Yet, the association between coaching practice and injury is not as straightforward as it might seem. Indeed, the coaching process is complex and cannot be assumed to be one-directional (Lyle, 1999). On the one hand, Krane et al.'s (1997) research illustrates how coaches' beliefs and actions can impact injury. Yet, on the other hand, athletes do not have to conform to these practices. Further, coaches report that athletes impose stressors on them (Didymus, 2016; Olusoga, Butt, Hays, & Maynard, 2009; Thelwell, Weston, Greenlees, & Hutchings, 2008). Stressors include athletes not admitting to

being injured (Thelwell et al., 2008), athletes training despite chronic injuries (Didymus, 2016), and a lack of personal disclosure surrounding injury (Cavallerio et al., 2016). By way of addressing this paradox and recognising that coaching is often defined by the nature and quality of interaction that occurs between coaching and athletes (Lyle, 2002), Cavallerio et al. (2016) emphasised the value of communication and the importance of mutual or shared understanding (Lorimer & Jowett, 2009; Jones, Armour, & Potrac, 2004). That is, athletes' and coaches' capacity of accurately perceiving each other's feelings, thoughts, and behaviours. Put another way, shared understanding enables coaches and athletes to 'be on the same page' and thereby to better manage their interactions and relationship. For coaches and athletes to increase their shared understanding, Lorimer and Jowett (2009) recommended that they should each actively attempt to understand each other. One way to facilitate this is by looking for ways by which they can improve their communication; time could be taken outside training sessions, sessions lengthened, or less attempted within the allotted time, to allow for conversation and interaction between coach and athlete. However, this recommendation needs to be considered in the wider institutional and cultural climate where there is a perceived lack of time to speak to athletes due to the increased demands placed on coaches.

An Institutional and Cultural Perspective

Sport coaches operate within a complex, ever changing environment that imposes many pressures on them (Fletcher & Scott, 2010). In recent years, there has been growing recognition of the stressful nature of coaching and that coaches should be labelled as 'performers' in their own right (Frey, 2007; Olusoga et al., 2009; Thelwell et al., 2008). For example, Thelwell et al. (2008) interviewed British coaches and following inductive and deductive analysis procedures identified 182 stressors that they experience. Not only were performance-related demands identified, but also organisational stressors that related to the training environment, competitive environment, finances, stability, selection, travel, safety, administration,

organisation, other coaches, athletes, private life, social life, contractual issues, team atmosphere, roles, and communication. These demands have been observed to affect coaches in positive and negative ways, resulting in divergent effects on their personal well-being and job performance (Goodger, Gorely, Lavallee, & Harwood, 2007; Thelwell, Wagstaff, Chapman, & Kentta, 2017). Thelwell et al. (2017) found that coaches perceive themselves to be less effective when stressed, which was reflective of their perceptions of competence, self-awareness, and coaching quality. Examples of this reduced effectiveness include adopting a more commanding style when coaching, forgetting about player needs when instructing, talking down to players, and the creation of a negative environment. Clearly, these findings reinforce the notion that coaches operate within a highly demanding environment that can impact them and their relationships with athletes, which needs to be acknowledged and accounted for when considering whether coaches impact injury.

To further understand overuse injuries at an institutional level, Cavallerio et al. (2016) conducted a 12-month ethnography at an elite rhythmic gymnastics club in Italy. Ethnography was chosen because it seeks to develop an understanding of a group's culture and of people's behaviour in the context of that culture (Wolcott, 2005). Founded in the 1980's, the club was based in Italy and is consistently among one of the highest performing clubs within the country. It was identified that the values of the club and the demands imposed on the coach by the club's president affected the coaches' behaviour which, in turn, impacted the gymnasts' state-of-mind and the occurrence and experience of overuse injuries. To illustrate, the values of the club were sporting success (i.e., winning and 'being the best'), discipline (i.e., complete dedication, unwavering commitment, and a high work ethic), and striving for perfection. These values were learnt, accepted, and adopted by the coaches through a process of occupational socialization, which impacted their actions: encouraging participation in practices when in pain, depriving athletes of attention and considering them 'weak' if they do not comply to extreme training

regimes, and using punishment if imposed standards are not met. The findings resonate with Nixon's (1993) research on the culture of risk, where a sport culture normalises pain and injury. In a culture of risk, pain is seen as something that has to be accepted and endured in order to succeed, in line with the slogan 'no pain, no pain' (Loland, 2006). Yet, while the coaches in Cavallerio's et al.'s (2016) study did adopt the club's values that ultimately led to injury, it is important to acknowledge that this may not always be the case. Some coaches may challenge the club's values or accept them and subvert them in practice. However, while some readers might be questioning the integrity of the gymnastics club, the critical reader will be cognisant of the wider cultural climate and how this might be impacting the club's functioning.

The cultural unit of analysis reflects the media, cultural narratives, and collective norms, traditions, and values. To provide an illustration, sport is represented to the public on a daily basis through various mediums (e.g., television coverage, documentaries, newspaper, magazines, autobiographies, films). Through these channels, public portrayals have a wide reach and exert a powerful influence, serving as a potent means of socialisation and enculturation into sport. Douglas and Carless (2015) reported that these public portrayals help to create a *master-narrative* of what sport *is* and what it *means*, which naturalises and normalises a view of sport and sportspeople that is often inaccessible to our conscious recognition. They described four particular characteristics that are evident in many public portrayals: *The Sportsperson as Hero*, *War Metaphors*, *Winning is Everything*, and *Body as Machine*. Of interest within this chapter is the latter characteristic, where it is often emphasised in the media that an athlete's body is a 'machine'. Consequently, a sportsperson's body–and often their mind as well–is viewed in mechanistic terms: as a machine to be developed and fine-tuned (Douglas & Carless, 2015). Indeed, the 'body as machine' metaphor promotes the body being seen as an object to be worked on that will underpin and guide practice to elicit 'maximum output' or 'maximum performance'. These practices can range from safe and

harmless behavioural interventions (e.g., sleep, rest, dietary modification) right through to potentially damaging practices such as abusing training programmes and training despite pain and injury. Yet, what happens when this 'machine' breaks down? What if the machine cannot be 'fixed'? Further, there is a danger that this metaphor will serve to depersonalise and detach the body from the self. In light of the prevalence of athletes physically abusing their bodies (e.g., Cavallerio et al., 2016; Krane et al., 1997), feelings of concern in this regard are justified. All in all, the master narrative that surrounds what sport *is* and what it *means* provides an illustration of the cultural pressures that might impact other units of analyses.

Can Coaches be Impacted by Sport Injury?

This section is interested in responses to and rehabilitation from injury, with a specific focus on the impact that injuries can have on coaches. This area of research has largely been guided by Wiese-Bjornstal et al.'s (1998) integrated model of response to sport injury. The integrated model suggests that athletes' emotional and behavioural responses to injury affect recovery outcomes, which are moderated by both pre-injury and post-injury factors and mediated by the process of cognitive appraisal. Post-injury factors include personal (e.g., injury type and severity) and situational variables (e.g., social support and rehabilitation environment). As a stress-process based model that embraces the concept of change, athletes' physical and psychological recovery is viewed as a dynamic, interactive process in which cognitive, emotions, and behaviours are explained within a cyclical cognitive framework. Although the integrated model has yet to be examined in its entirety, researchers have focused on and supported a number of its central hypotheses (for reviews, see Brewer, 2010; Levy et al., 2006; Wadey & Evans, 2011). However, the integrated model largely operates at an intrapersonal perspective, ignoring the impact of injury on others and how situational factors operate at different units of analysis. The purpose of this section, therefore, is to synthesize contemporary research targeting units of analysis that operate above and beyond an

intrapersonal perspective. Underpinned by the MMSI, this section largely operates at an *Interpersonal* level of analysis and aims to provide critical insights into the experiences of and by coaches in the aftermath of a sport injury. Consideration of these experiences at an *Institutional* level of analysis will also be critically considered. Future researchers need to critically consider how cultural and policy levels might impact other levels in the MMSI.

To understand the potential impact that an athlete's injury may have on coaches, a growing body of research has explored athletes' accounts of their relationships with their coaches in an injury context (Abgarov, Jeffery-Tosoni, Baker, & Fraser-Thomas, 2012; Bianco, 2001; Surya, Benson, Balish, & Eys, 2015; Tracey, 2003; Udry, Gould, Bridges, & Tuffey, 1997). This research not only typifies the complexity of the coach-athlete relationship, but also illuminates multiple perspectives on the support provided by coaches to athletes after injury. On the one hand, researchers such as Bianco (2001) have provided a positive perspective on the role of the coach after injury. After interviewing elite skiers, Bianco found that when these skiers perceived a positive relationship with their coach, support from that coach after injury was seen as desirable, perceived to be helpful, and had motivational consequences. Yet, on the other hand, both Udry et al. (1997) and Abgarov et al. (2012) have provided a more critical athlete perspective on coach responses to injury. In similarity to Bianco (2001), Udry et al. also interviewed elite skiers, yet here results illustrate that participants described being ignored by their coach after sustaining a season-ending injury. This also resonates with Abramov et al. (2012) who explored swimmers' experiences of social support during injury and who reported on the experiences of three participants who described that their attempts to communicate with their coach left them feeling overlooked and pushed aside. Further, Abramov et al. (2012) reported suggestions across the interviews conducted that coaches' actions were indicative of denial about the injury. Finally, Tracey (2003) provides an alternative perspective suggesting that in a population of student-athletes with moderate-to-severe injuries, most did not even

request support from their coaches because they felt they did not want to admit the seriousness of their injuries and felt uncomfortable asking for help. Taken together, while this research focuses on how athletes may feel supported or unsupported with coaches after injury, it also illuminates the potential that coaches themselves may be impacted by athletes' injuries. For example, while coaches may be expected to be supportive to athletes after injury, we may question why some coaches may avoid or deny conversations about injury. Such behaviours are often reported as harmful to the athlete, yet until recently, researchers had not considered the underlying reasons for such behaviours from the perspective of the coach.

Building upon and complimenting the previous body of research, a number of contemporary studies have illustrated the perceptions of coaches, identifying how an injury to one of their athletes imposes stressors on them (e.g., Didymus, 2016; Olusoga et al., 2009; Thelwell et al., 2008). For example, elite coaches view injury to an athlete as a major stressor (Thelwell et al., 2008), including chronic injuries, acute injuries, injury rehabilitation, and injury anticipation (Didymus, 2016). One coach stated, "You just dread your key players getting injured…especially the ones that make things tick for you or the ones that do the special things in a game…you can't do anything about it, but when you lose your big players it certainly creates headaches" (Thelwell et al. 2008, p. 910). These 'headaches' can include, amongst other things, changes to team strategy, tactics and selection. Clearly, these findings combined with previous research from the injured athletes' perspective provide a more well-rounded understanding of the impact of injury on coaches. On the one hand, injured athletes are likely to have specific expectations of the support they should receive from their coaches and subsequent satisfaction is likely to be determined on whether or not their expectations are met. Applied recommendations, therefore, are likely to target enhancing the quality of the support exchange (communication) between recipient and provider, especially considering that this is a critical feature of social support (Bianco & Eklund, 2001). For example, coaches should

spend more time with injured athletes, listening to their concerns and worries to help alleviate the overall demand they are under. On the other hand, injury causes stressors for coaches (e.g., team strategy and selection), which injured athletes may or may not be aware of. Therefore, applied recommendations also need to account for these additional demands on the coach, especially considering that injury may be one of 182 stressors that they need to manage in order to function effectively (Thelwell et al., 2008). Yet, while injury may impose performance and organisational-related environmental stressors on coaches, how injuries affect coaches psychologically has only recently been explored.

There have been two recent detailed explorations of coaches' personal experiences of their athletes' injuries. Utilising life history interviews, Day et al. (2013) studied the experiences of two national level trampoline coaches from the same club who were both present during a training session in which one of their athletes sustained an open leg fracture. Both coaches recalled that re-entering the environment in which the incident had occurred and having contact with the injured athlete would trigger unpleasant episodes of involuntarily re-experiencing (i.e., intrusions) the injury event. As such, there was considerable effort exerted by the coaches to avoid conversations about the injury within the training environment. Day et al. (2013) further reported that such avoidance was found to restrict the coaches' abilities to receive social support. By identifying that the two coaches had experienced intrusions and avoidance in the aftermath of witnessing an athlete's injury, Day et al. (2013) construed a link with hallmark symptoms of post-traumatic stress (Brewin & Holmes, 2003; McNally, 2004). Indeed, the oscillation between intrusions (e.g. involuntarily re-experiencing the event) and behavioural as well as cognitive avoidance of event-related stimuli after witnessing (i.e., vicarious exposure) or learning about (i.e., indirect exposure) a traumatic stressor are recognised by the Diagnostic and Statistical Manual of Mental Disorders (DSM-5) as part of a constellation of post-traumatic stress symptoms that may become clinically significant if they

persist for more than six months; a diagnosis of Post-Traumatic Stress Disorder (PTSD) (APA, 2013; Friedman, 2013).

Building upon the work by Day et al. (2013), Martinelli et al. (2016) examined the emotional responses experienced by a variety of coaches in the aftermath of an athlete's injury. The experience of guilt was identified as a key emotion that could be difficult to manage. Guilt is an intense and unpleasantly valenced affective state, accompanied by beliefs that one should have thought, felt or acted differently (Blum, 2008; Pugh, Taylor & Berry, 2015). Guilt therefore constitutes a sense of wrongdoing because of the perceived connection between one's actions or inactions and a negative outcome; hence some aspect of the self is being experienced in a negative way (Lee, Scragg, & Turner, 2001). The coaches interviewed by Martinelli et al. also reported several ways in which they had coped or could cope with experiencing guilt. These strategies included: seeking reparation through punishment (i.e. requesting that the injured athlete take legal action against the coach), keeping a contactable distance (i.e. physical avoidance of the athlete whilst still offering some emotional and tangible support), terminating one's involvement in sport, or constructing lessons from the felt mistakes.

In accordance with Martinelli et al. (2016) it is important to emphasise the subjectivity of the guilt felt by these coaches whereby this emotion was recognized as an inevitable quality to their responses to an athlete's injury, irrespective of the "objective" circumstances surrounding the occurrence of the injury. To understand why this may be, it is useful to go above and beyond an *interpersonal* level of analysis; considering other levels of the MMSI, in particular an *institutional* level. Our understanding of what it means to be a coach is increasingly defined from a deontological perspective that centers on the coach's duties or obligations and their sports participants' entitlements, as evidenced in the development of generic standards of practice or codes of conduct (Hardman & Jones, 2013). Examples of this can be seen in the code of practice put forward by Sports Coach UK (2005) which states that

449 individuals with good coaching practice are those who, "ensure that the environment is as safe
450 as possible, taking into account and minimising possible risks", and who "accept responsibility
451 for their actions" (p. 3). Such *institutional* messages encourage a seemingly inseparable
452 connection between the coach and the physical integrity of an athlete, and for McNamee
453 (2011), these codes of practice "franchise 'blameability' [sic] and consequently 'punishability'
454 [sic] to their respective organisations" (p. 25). Clearly, not only is it important to provide a duty
455 of care to those who participate in sport, but it is also essential that policies and practices are
456 in place to support coaches too. For example, as Baroness Grey-Thompson (2015) proposed:
457 "Staff, coaches, and athletes to receive mental health awareness training and support" (p. 32).

458 **Implications for Applied Practice**

459 To revisit the question posed in this chapter—Can coaches impact and be impacted
460 sport injury?—the answer is a resounding *yes*. But, it is a complex question that needs to be
461 considered across several units of analysis before reaching any definitive conclusion and
462 informing policy to support the duty of care of coaches. Thus far, implications drawn from the
463 psychology of sport injury literature are rarely directed at coaches. While coaches have been
464 criticized for their reluctance to talk about injury (Bianco, 2001; Surya et al., 2015; Tracey,
465 2003; Udry et al., 1997), there are limited resources available to enable coaches to reflect on
466 and/or debate injury with other coaches in order to reduce the likelihood of injury and its
467 potential impact. Consequently, in this subsection we illustrate how the MMSI can be used to
468 consider the implications of injury for coaches. In doing this, we focus on implications that go
469 beyond the *intrapersonal* unit level of analysis and instead consider the wider social-
470 organisational-cultural implications.

471 At an *interpersonal* level, this chapter highlights the complex environments coaches
472 operate in, the pressures they are under, and how their practices can lead to injury. We pose

three pertinent recommendations here. First, coaches need to raise awareness of their own coaching philosophies (as well as other philosophies available to them) and how it may relate to injury. There are a number of excellence resources available for coaches that can be drawn upon and reflected upon to challenge and refine one's philosophy (Lyle & Cushion, 2017). Second, considering the significant stress experienced by coaches, coaches should be labelled as 'performers' in their own right. Underpinned by the Meta-Model of Stress, Emotions, and Performance (Fletcher & Scott, 2010), a tripartite approach to stress management could be implemented: primary interventions to combat strain by eliminating or at least reducing the quantity, frequency, and/or intensity of stressors, hence alleviating the overall demand place upon the coach; secondary interventions to increase coaches' awareness of their stress-related reactions and to enhance their resiliency to stressors through 'mental toughness' training programmes; and tertiary interventions that minimise the damaging consequences of stressors by helping coaches cope more effectively with reduce well-being or performance as a result of strain. A final strategy would be to enhance communication in the coach-athlete relationship to enable coaches and athletes to 'be on the same page' and thereby enable them to better manage their interactions and relationship. Time could be taken outside training sessions, sessions lengthened, or less attempted within the allotted time, to allow for conversation and interact.

At an *institutional* and *cultural* level, coaches may be part of what Norman (2010) terms a community of practice, which includes other coaches and the sporting organisation. Entry into such a community contributes to a neophyte coach's socialization within the subculture (Jones et al., 2012). Yet, as highlighted in this chapter, the norms and values within certain sporting clubs and organisations promotes the tendency to assume a totalitarian belief that winning is, and must be, the primary focus for all professionals (Douglas & Carless, 2009). The implication for coaches here is that winning, results, and achievements are pre-eminent

and thus the performance of the athlete may also link closely to the mental well-being, identity, and self-worth of the coach. Injury is therefore unacceptable, and actions such as encouraging the minimisation of pain and the glorification of playing injured serve to re-enforce these norms and values. Such actions are often further celebrated by media portrayals of injury as narratives of heroic disposition (Anderson & Kian, 2012) and consequently alternative norms and values are silenced. Coaches might therefore be encouraged to reflect on dominant stories of injury within their community of practice and consider the availability of counter stories. As Hall and Gray (2016) suggest, in order to challenge culturally situated practice rather than accommodate it, the potential of reflective practice must be maximized thorough questioning discursive complexities of practice and challenging assumptions.

Finally, at a *Policy* level it is important to consider the formal coach education programmes run by governing bodies. Interestingly, research has provided valuable guidance on the appropriate psychological aspects of sports injuries that should be delivered to sport injury rehabilitation professionals (Heaney et al., 2014) and professional bodies such as the Society of Sports Therapists and the National Athletic Trainers' Association have mandatory requirements for degree programmes to cover aspects of sport psychology (NATA, 2011; SST, 2005). Yet, such competencies are rarely specified for sport coaches. As a consequence, sport coaches are not only unprepared to support athletes during injury, but are also unaware of the psychological consequences that they themselves may experience (Day et al., 2013; Martinelli et al., 2016). By not adequately preparing coaches to cope with the psychological manifestations of injury, we are not only producing coaches who are ill equipped, but also those who will recycle injury practices taught to them by their own coaches rather than providing a developmental approach. Consequently, policy makers need to ensure that competencies for sports coaches go beyond the need for first aid training and ensure coaches are prepared for the psychological impacts of chronic, acute, and traumatic injury.

To conclude this section, we pose the following questions to coaches to reflect upon, which can also be used at professional development courses to encourage debate:

- What is your coaching philosophy? How might this philosophy impact injury?
- How well do you know your athletes? Would you be able to interpret their thoughts and feelings? Would they be able to interpret yours?
- What pressures are the culture and organisation you're operating within imposing on you? How are these pressures impacting your coaching practice?
- What social support do you provide to your injured athletes and how effective are these support exchanges between you and your injured athletes?
- What impact does an athlete's injury have on you? What coping strategies do you have to meet these demands?
- Has an athlete's injury affected you (or another coach you know) psychologically?
- What policies and practices within your organisations are available to support you?

Implications for Future Research

Given the limited research focus on understanding whether coaches impact and can be impacted by injury, there is a vast array of potential avenues for future research. In particular, future researchers should be careful in only focusing on and accounting for one level of analysis; rather they should be more critical on identifying and understanding the forces that shape coach behaviours and attitudes towards injury. In recent years, a rich body of literature has emerged on head injury and concussion in sport (Podlog, 2016). Yet, what sets this body of literature apart from much of the psychology of sport injury research is the recognition of the important role that sport coaches have in concussion recognition, management, and resolution. Indeed, while similar cultural values, such as the minimization of pain, are evident, the literature in this area also focuses on the importance of educating coaches and disseminating

concussion information to coaches (Covassin, Elbin, & Sarmiento, 2012). Such an approach, which recognizes the challenges, but provides meaningful solutions would be valued for all types of sports injury research.

As suggested within this chapter, without a policy level focus on coach education, coaches may be forced to rely on recycled rather than developed approaches to injury. As Werthner and Trudel (2009) have suggested, coach learning is generally developed from five learning situations: past experiences as an athlete, formal education (schooling), coaching courses, mentoring from other coaches, and 'constantly thinking' about coaching. Where topics such as injury are absent from coaching courses, it is important to understand the idiosyncrasies of these other learning paths. For example, how do coaches past experiences of injury as an athlete impact on their current responses to injury as a coach? Do mentor coaches encourage conformity to a culture of risk? Finally, we would encourage future researchers to be creative in their approaches to understanding injury. In particular, qualitative methods that use stories as discussion prompts may encourage coaches to speak more openly about their injury experiences. Methods such as story completion (Braun & Clarke, 2013) and the use of non-fictional vignettes (Callary, Werthner, & Trudel, 2016) may prompt written disclosure or interview discussions about injury. Furthermore, researchers should also consider how this new knowledge is disseminated in more creative ways that are accessible to sports coaches. Examples might include the use of creative non-fiction (Smith, McGannon, & Williams, 2015), ethnodrama (Cassidy, Kidman, & Dudfield, 2012), and blogging (Burdon & Clarke, 2015), poetry (Sparkes & Douglas, 2007). Many of these represent exciting and unfamiliar terrains for the psychology of sport injury literature.

Conclusion

570 The psychology of sport injury is an established field of research that offers
571 practitioners working with injured athletes a rich-resource to inform their practice. Yet, it is
572 now time to expand our knowledge by going above and beyond an intrapersonal unit level of
573 analysis to further contextualise the wider social-organisational-cultural influences and the web
574 of relationships with significant others that impact the sport injury process. In this chapter we
575 propose a new conceptual model that extends current theorising: *Multilevel Model of Sport*
576 *Injury* (MMSI). By doing so, the MMSI provides a platform for future research by illustrating
577 how injury can be influenced at multiple levels (and vice versa). We also provided a population-
578 specific example of the MMSI by critically examining whether coaches impact and can be
579 impacted by injury. We conclude that answers to these questions are complex and need to be
580 considered across multiple levels before reaching any definitive conclusion and informing
581 policy. Practical recommendations and future research avenues are discussed, which represent
582 exciting and unfamiliar terrains for the psychology of sport injury literature.

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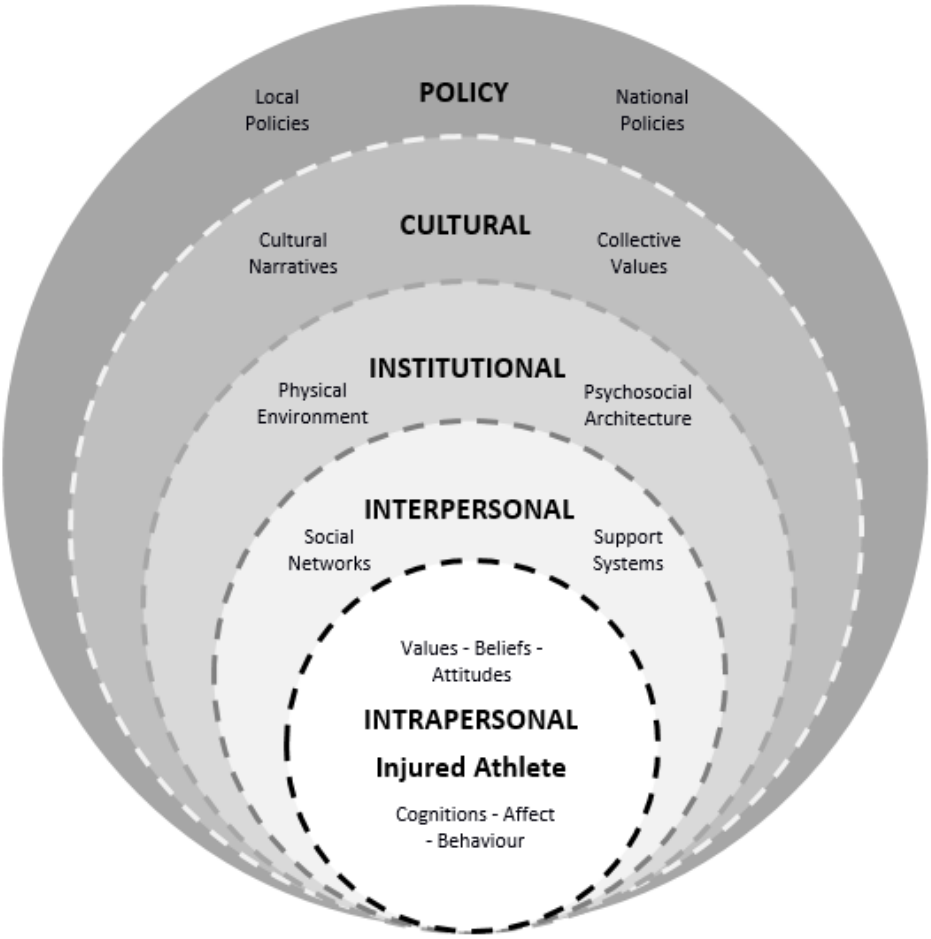
817 Figure Caption



818

819 *Figure 1.* Multilevel Model of Sport Injury (with examples)