RE-THINKING CONCUSSION SUPPORT: FROM PSYCHOLOGICAL AND SOCIAL NEEDS TO LEVERAGING MENTAL PERFORMANCE CONSULTANTS

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Abstract

The overarching purposes of this research were to (a) explore an under-acknowledged and under-emphasized aspect of the sport-related concussion experience: psychosocial factors of the injury experience and (b) identify possible intervention opportunities to support the associated psychological and social needs. A collaborative inquiry (Bray et al., 2000) was employed to generate data on the psychosocial experience of concussions in elite sport and to co-develop support strategies from a sport psychology lens. This qualitative research project involved three phases during which psychological and social needs, as well as psychosocial factors that facilitated and/or hindered the concussion recovery process, were discussed through two lenses. The first lens was an experiential one, whereby elite athletes who became concussed as a result of their sport engagement shared their experiences (Phase A). The second lens was that of professional expertise, whereby mental performance consultants who work in elite sport and deliver psychosocial support to concussed elite athletes shared their perspectives and clients' experiences (Phase B). Following the sharing of these perspectives, a community of practice (Wenger et al., 2002) of mental performance consultants was formed to collaboratively discuss how mental performance consultants might be able to support the aforementioned psychological and social needs, and ultimately, concussion recovery (Phase C).

Phase A. Ten elite athletes (as defined by Swann et al., 2015) participated in semi-structured focus groups (Smith & Sparkes, 2016). Athletes discussed their experiences of injury, challenges, facilitators and barriers to recovery, support mechanisms, support that was lacking but desired, and what they would do to help someone else with a concussion. The transcripts from these focus groups (n = 5, *M* = 58.1 min, Range: 46-88 min), follow-up questions, and

informal conversations were analyzed using thematic narrative analysis (Smith, 2016), contributing to an understanding of the athletes' lived experiences.

Phase B. Nine mental performance consultants from the Canadian Sport Psychology Association and/or Association for Applied Sport Psychology who were working in high-performance sport participated in three focus groups (*M* = 79 min, Range = 66-98 min). Mental performance consultants were asked about their time in the field and other aspects of their consulting experience (e.g., sports, integrated within teams or not), the types of interventions they have done with concussed athletes, their perceptions of psychosocial support during the phases of concussion management, and challenges to effective service delivery. Verbatim transcripts of these focus groups were sent to the consultants and member reflections were requested (Smith & McGannon, 2018). The generated data were thematically analyzed using a six-phase cyclical and iterative approach (Braun et al., 2016).

Phase C. Eight mental performance consultants from various sport contexts formed a community of practice (Wenger et al., 2002; E. Wenger-Trayner & Wenger-Trayner, 2021). The group met over a period of four months (n = 8 meetings, *M* = 80 min, Range = 60-90 min). These meetings were intended to address the identified interests of the members of the community regarding support for concussed elite athletes. Concussion symptomatology, management efforts, and research were discussed; and professional scope of practice and intervention opportunities were explored through best practice discussions, client case studies, and engagements with two external experts. Mental performance consultants completed individual reflections (i.e., weekly reflective questions, value creation stories, personal value narratives; Wenger et al., 2011; E. Wenger-Trayner & Wenger-Trayner, 2015) resulting in 34 single-spaced pages of generated data, which were analyzed using the Value Creation Framework (E. Wenger-Trayner & Wenger-

Trayner, 2015; 2021).

The results of this multi-phase collaborative inquiry are presented in four articles. The first article offers a multi-systems perspective (Bronfenbrenner, 1977; 1979; 1992) on athletes' concussion experiences by exploring two collaboratively created narratives (Wertz, 2011; Willis, 2019) from the engagements with athletes in Phase A. Five themes (i.e., athletic identity, (dis)trust in relationships, concussion protocols, sport culture, and timing related to major events and recovery) are discussed. The second article combines the perspectives of athletes from Phase A and mental performance consultants in Phase B to identify psychological and social needs across the concussion recovery process. Four psychological needs (i.e., acceptance, normality, confidence, self-efficacy) and two social needs (i.e., trust in relationships, social support) were identified by both populations. The third article was collaboratively written to practically present how and where mental performance consultants can support concussed athletes across the phases of the injury based on the discussions in Phase C. Scope of practice, collaboration opportunities, and intervention strategies are discussed across four phases of injury (i.e., pre-injury, injury onset, rehabilitation, return to sport). The fourth article reflects the mental performance consultants' participatory experiences in Phase C by exploring the value of the community of practice as a professional development and knowledge translation tool. Positive value was experienced across all eight cycles of the Value Creation Framework. Through the general discussion and practical implications sections of this dissertation, these results are situated within the landscapes of concussion research and practice to highlight opportunities for transforming concussion protocols and broadening the overall lens through which the concussion experience can be examined.

Keywords: sport-related concussion management, collaborative inquiry, sport psychology

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Statement of Contribution

I, Cassandra Marie Seguin, confirm that I collected and analyzed the data across all three phases of this research project. With regards to authorship, I lead each of the four articles included within this doctoral dissertation. My supervisor, Dr. Diane Culver, was directly involved in every phase of the research. Her efforts include contributions to the conceptualization of the project in its entirety, regular support and feedback throughout data collection and analysis, and participation in Phase 3. Dr. Culver also provided constructive feedback and revisions for all four of the included articles and the dissertation as a whole. In addition, she contributed to the writing of the fourth article. Drs. Natalie Durand-Bush and Jeffrey Caron (thesis supervisory committee members) contributed to this research by offering conceptual feedback in the proposal phase of this research, acting as critical friends at various points throughout the research, as well as in the modification of phase plans when our initial proposal plan changed as a result of the Covid-19 pandemic. The four co-authors outside Dr. Culver and I in the third article contributed to the conceptualization of the manuscript, as well as the writing and revision of that article. Inviting these co-researchers to co-author this article is in line with the participatory approach and was deemed important to the dissemination of the research. Dr. Erin Kraft contributed to the writing and revision of the fourth article, and offered methodological guidance during the phase of research which informed that article (Phase 3). Finally, ethics approval for all three phases of the research was obtained through the Research Ethics Board of the Office of Research Ethics and Integrity at the University of Ottawa.

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Introduction

The dominant medicalized lens that has been used to inspect sport-related concussion has undeniably demonstrated the complexity of the injury and the importance of targeted treatment (e.g., Langdon et al., 2020). While such advancements have drawn significant attention to the concussion management challenge, aspects of the concussion experience that span beyond physiology and neurobiology were largely ignored in the management process until recently. Sport injury researchers in the last ten years have initiated a wave of inquiry to understand psychological, social, and cultural aspects of concussions (e.g., Caron et al., 2013; Kontos, 2017). Through these explorations, it is clear that concussion management has largely adopted a health-care or medicalized approach which often lacks psychosocial support mechanisms. Herein lies an additional complication as little research was dedicated to identifying the psychological and social needs which exist and require such support. Traditional, positivistic research methods have revealed the existence of some symptoms that fall within this area of need (e.g., behavioural and/or mood changes; Kontos et al., 2019). However, a recent shift towards qualitative methodologies has signaled that a greater understanding of individual experiences is required to recognize these needs and develop corresponding support mechanisms (Wadey & Day, 2022).

This doctoral research is consequently intended as a catalyst for shifting research towards understanding concussion experiences and potential psychosocial support mechanisms. The deliberate engagement of those who experience these injuries (i.e., athletes) and those who are in a position to provide psychosocial support (e.g., mental performance consultants) represents an effort toward combining lived experience and contextual expertise. This combination of experience and expertise offers a unique opportunity to bridge research and practice simultaneously, responding directly to a recent area of criticism in the field, which suggests that

research and practice operate in silos (e.g., Malcolm, 2020; Podlog et al., 2019; Ventresca, 2020). As such, the primary purpose of this research was to understand psychological and social needs through these combined perspectives, while considering mechanisms of support to address those needs. It is contextualized within high-performance sport, considering the experiences of those competing and operating within that context. A novel qualitative methodology to the field of sport-related concussion research is leveraged with the intent of improving knowledge translation between experience, intervention, and academia. This nexus of collaborative engagement between research and applied communities has been an underexplored space, despite its potential value and apparent necessity.

Recent calls to leverage participatory methods of inquiry to bridge the gap between research and practice (e.g., the valley of death; Evans & Brewer, 2022) demonstrate the timeliness of this research. As our understanding of sport-related concussions has evolved and expanded to encompass a multitude of phases and specialties, practical guidance on how psychosocial aspects of these injuries can be managed has lagged. The aim of this dissertation is thus three-fold: (1) to demonstrate the impact that this knowledge gap has had on athletes' lived experience of concussion, (2) to explore what aspects of the psychosocial experiences should be addressed and how they might be addressed by mental performance consultants, and (3) to illustrate how a participatory approach was used to advance both research and practice to initiate a response towards this gap.

Review of Literature

The following section presents three principal areas of literature that are important in situating this doctoral research. The first area of interest is sport-related concussion (SRC); this form of traumatic brain injury has received significant attention from sport, research, and health care communities in the last several decades. This subsection of the review is designed to synthesize some of this information, particularly as conceptualizing possible support strategies requires an understanding of the injury itself, and its complexities. The subsequent subsection explores the next area of interest: psychological skills training. This form of training is often the primary intervention tool for mental performance consultants (MPCs) and other sport psychology practitioners in the provision of performance and injury support. Given its applicability within psychosocial support strategies, this tool of intervention needs to be understood within injury-support contexts. The final subsection of this review is dedicated to the topic of high-performance sport, as it is both the context of the current research, as well as the domain in which elite athletes (i.e., the population of interest) are housed within sport literature. As such, an understanding of this sport context and the athletes who occupy this domain is necessary. The three subsections below will explore relevant information on these three areas of interest; the inclusion of this information is based on the doctoral candidate and supervisor's interpretations of the research and serves to contextualize the current project within the broader literature. Of note, this review of literature was originally conducted in 2019 and represents the state of the literature at the time of the doctoral candidate's research proposal. In some strategic instances, more recent references have been included; these additions are intended to reflect the significance of some of the information, replace previous information that has since been revised or updated, or to highlight the timeliness of this project.

Sport-Related Concussion

Although the term "injury" is predominantly associated with physical signs and symptoms, oftentimes such events are also impactful on psychosocial well-being (Podlog et al., 2011). SRCs not only provoke both physical and psychosocial responses, but further pose a unique challenge, in part due to their inherent invisibility (Bloom et al., 2004; King et al., 2014). The most recent international consensus statement by the Concussion in Sport Group (i.e., McCrory et al., 2017) defined SRC as "a traumatic brain injury induced by biomechanical forces" (p. 839) which could be caused by either some form of direct contact to the head, or indirect force to the body which is transmitted to the head. Such events can result in a variety of clinical symptoms. These symptoms can vary greatly between and within individuals, and can result in cognitive, psychosocial, emotional, and behavioural impacts (e.g., balance impairments, depression; McCrory et al., 2017; Voormolen et al., 2018). Furthermore, the experience of protracted symptoms (i.e., symptoms that surpass the typical 10 to 14-day recovery period; Caron et al., 2017; Makdissi et al., 2013) can further exacerbate concussion experiences (Cushman et al., 2018; Elbin et al., 2018). Despite exponential advancements over the last two decades regarding our understanding of concussions, "researchers and clinicians on the front lines of care recognize that continued voids exist in our knowledge, with the need to continually explore new methods to identify and manage the complex immediate and potentially long-term ramifications of concussion" (Knollman-Porter et al., 2019, pp. 3-4).

Thus far, concussion management efforts have originated predominantly from the health care setting, highlighting the research and opinions of the medical (e.g., medical doctors, neurologists) and specialized health domain experts (e.g., athletic therapists). This prioritization of opinion is exemplified within the most recent SRC consensus statement; all 36 Concussion in

Sport Group members who authored the statement are experts from either or both domains (q.v., McCrory et al., 2017). This consensus statement currently informs most, if not all SRC management protocols around the world, despite being applied to varying degrees across sporting contexts (Piedade et al., 2021; Scullion & Heron, 2022). The absence of experts beyond medical and specialized health domains in this area resultantly presents a significant problem: symptoms that fall outside the disciplines of these experts are either ineffectively or entirely unaddressed by these derivative protocols. This critical gap in care represents a significant failure, particularly as the psychosocial ramifications of SRCs are commonly denoted within and outside of research (e.g., Hind et al., 2021; Jeckell & Fontana, 2021; Whyno, 2021). Perhaps even more shockingly, this gap comes despite the Concussion in Sport Group actually advocating for multifaceted management strategies and acknowledging that psychological consequences can occur (McCrory et al., 2017). To provide athletes with the comprehensive and individualized care they need, concussion management strategies need to be broadened to account for psychological, social and emotional symptoms, as well as support strategies directed towards related outcomes.

In 2004, Bloom and colleagues proposed that sport psychology practitioners (e.g., MPCs) could contribute to this necessary collaborative and multifaceted concussion management team by utilizing sport psychology techniques with concussed individuals (AASP, 2015; McCalla & Fitzpatrick, 2016; Kontos et al., 2004) to address this apparent void. Despite agreement on this point from international sport psychology organizations like the Association for Applied Sport Psychology (AASP), little research was conducted on relevant psychological topics until the mid-2010s. At this time, research on the lived experience of SRCs started getting published within peer-reviewed journals, which highlighted diverse perspectives on the psychosocial

experiences of concussed athletes (e.g., Adams et al., 2018; Cover et al., 2018; Malcolm, 2018). Some examples of research that have explored the concussion experience have highlighted occurrences of social isolation, symptoms of depression and anxiety, loss of identity, and fears related to self-presentation and external perceptions (e.g., Caron et al., 2017; Cover et al., 2018; Moreau et al., 2014). Around this time, Wiese-Bjornstal and colleagues (2015) extended their previous theoretical model on the psychology of sport injury to concussions on the basis of their narrative review of the literature to date. This model importantly presented pre-injury risk factors, post-injury responses, rehabilitation processes, and service providers relevant to psychological care. The culmination of this research was an important stepping stone in addressing this aforementioned support gap, in that it started to highlight the frequency and diversity of these psychological, social, and emotional symptoms, particularly within elite sport (Vann et al., 2018). More recently, Bloom and colleagues (2020) emphasized the value of lived experience research and psychological symptom considerations, and advocated that concussion care and research need to continue to advance knowledge and support in these domains. They further articulated the need for interventions in this area, as well as the importance of holistic approaches to concussion management and support provision. While advances continue to be made in this area, there is still an absence of sufficient literature discussing how psychological, social, and emotional symptoms can be managed over the course of this complex injury.

Psychological Skills Training and Intervention

Within the fields of sport, exercise, and health psychology, interventions have been categorized primarily as social (i.e., focused on social factors), psychological (i.e., focused on individual thoughts and behaviours), or psychosocial in nature (i.e., integrating both psychological and social approaches; Brown & Fletcher, 2017). Such interventions can be

applied by practitioners from either the clinical or educational domains of sport psychology (Weinberg & Gould, 2018). Namely, those who have received clinical or counseling training (e.g., psychologists) and those who have been trained within the domain but have not received clinical or counseling licensing (e.g., MPCs) can offer these forms of interventions (AASP, n.d. a). The most significant difference between these two classes of experts lies in their professional ability or inability to treat and diagnosis psychological conditions (i.e., only psychologists may treat and diagnosis). According to a meta-analysis, psychological and psychosocial skill interventions have been largely investigated within the realm of sport, with a focus on increasing athletic performance (Brown & Fletcher, 2017). Such interventions are now being applied within other domains, including with performing artists (Allan, 2016; Ross & Shapiro, 2017), military populations (Fitzwater et al., 2018), patients who have received a diagnosis of a severe illness (e.g., cancer; Utay & Miller, 2006), as well as with those rehabilitating from injury (e.g., Arvinen-Barrow et al., 2015; Cressman & Dawson, 2011). These skill interventions are typically trained through individual, small group, or workshop settings (e.g., Stefanidis et al., 2017). Similar to physical skills, psychological skills require a considerable amount of time, commitment, and practice to be implemented effectively in an applied setting (Brown & Fletcher, 2017).

Within sport literature, psychological skills training has been used and documented as having positive performance implications in a variety of high-performance sport contexts (e.g., Beauchamp et al., 2012; Thelwell et al., 2006). Such implications have included enhanced psychological outcomes (e.g., motivation, positive perspectives towards sport participation; Birrer & Morgan, 2010; Podlog & Eklund, 2005), behaviour modification (e.g., self-regulation in response to high performance demands; Beauchamp et al., 2012; Massey et al., 2014), and

improved and sustained performance (e.g., Hacker, 2000; Hut et al., 2021). In the last two decades, psychological skills training has been increasingly implemented subsequent to sport-related injuries. This approach is largely in response to an improved understanding of the role of psychological factors in injury experiences and rehabilitation outcomes. As a variety of cognitive, affective, behavioural, and personal factors have been documented as influential on the rehabilitation process, interventions which target such factors are important (Brewer, 2010). To date, the general goals of psychological skills training integration within this context have included injury prevention (Tranaeus et al., 2015), increased adherence to rehabilitation programs (e.g., Scherzer et al., 2001), increased abilities to cope with injuries (e.g., Francis et al., 2000), management of psychological variables (e.g., confidence, concentration, anxiety reduction; I. Yoon & Yoon, 2014), and ultimately to help support recovery (e.g., Arvinen-Barrow et al., 2015). According to a review by Schwab Reese and colleagues (2012), psychological skills training using techniques such as goal setting, relaxation, and imagery have been associated with improved coping, reduced re-injury anxiety, and a decrease in negative psychological consequences. A more recent systematic review considered psychological interventions as a strategy for injury reduction and concluded that research on psychological skills training has demonstrated positive effects on injury and recovery rates (Gledhill et al., 2018).

Efforts in the applied sport psychology practice and research communities have largely originated in response to psychological experiences of injury. Research on psychological, social, and psychosocial aspects of injury experiences has been deemed as critical to informing psychological skills training interventions (Madrigal, 2015). However, the diversity of injury experiences was largely unexamined until research in the last ten years started to compare

psychological aspects of experience between musculoskeletal (i.e., orthopaedic) and concussive injuries. Covassin and colleagues (2014) for example, considered experiences of postinjury anxiety and social support between injury types. In this cross-sectional study, athletes with concussive and orthopaedic injuries relied on similar sources of social support and experienced similar trait and state anxiety. Turner and colleagues (2017) expanded on this line of inquiry, suggesting that athletes with concussions and those with musculoskeletal injuries experience similar clinical milestones in response to injuries, including improvements over time in emotional and psychological variables. Recently, Guo and colleagues (2020) considered psychological symptoms through a prospective cohort repeated measures study. In their research with collegiate athletes, they found that athletes with orthopaedic injuries scored higher on fear of return to sport and fear of reinjury than those with concussion. Conversely, athletes who experienced concussive injuries scored higher on depressive symptoms one month after injury, despite having similar scores to the orthopaedic injury group at baseline and one week post-injury (Guo et al., 2020).

Studies such as those listed above have been instrumental in informing psychological skills training interventions in the injury space. For example, a systematic review explored some of these forms of psychosocial interventions on protracted symptoms and offered promising, although preliminary results (Jaber et al., 2019). Additionally, Seguin & Durand-Bush (2019) developed a psychological skills training program (PSTP) for concussed athletes, which drew from psychological skills training and injury experience literature to inform their strategies. The program was piloted with two recreational athletes with post-concussion syndrome and yielded decreases in physical, psychological, and emotional symptom severities and frequencies (Seguin & Durand-Bush, 2017). At the time of the development of the program, psychological skills

training had not yet been examined as a mechanism for supporting concussed athletes, despite advocacy over ten years previously that sport psychology techniques (e.g., psychological skills training) may be valuable in supporting concussed athletes (Bloom et al., 2004). Additionally, at the time of the program's design, limited research had been conducted on the psychosocial needs of concussed athletes. Thus, while this program was an important early step in the provision of guidance to sport psychology audiences on possible support strategies, research targeting the identification of psychological and social needs that could be addressed by such interventions was absent at the time. Thus, the program serves as a preliminary springboard for psychosocial support, but requires expansion now that research has begun to delve deeper into the psychology of concussion. Additionally, a greater understanding of psychological skills training in the context of concussions is necessary.

High-Performance Sport

When considering sport, a number of terms describing the highest levels of competition have been inconsistently used across the literature. This was highlighted in a systematic literature review which explored issues in studying expert sport performance (Swann et al., 2015). Beyond the terms 'elite' and 'expert' athletes as identified in this review, athletes have also been considered as competing within 'high-performance' sport (e.g., Barker-Ruchti et al., 2014). Similarly, the terms 'elite', 'expert', and 'high-performance' have been interchangeably used to classify coaches and coaching domains (e.g., Lemyre et al., 2007; Trudel & Gilbert, 2006; Winman et al., 2010). For the purposes of this research, the terms 'high-performance sport' and 'elite athletes' will be used as those definitions appear most in line with our targeted population.

Specifically, the term high-performance sport is defined as the sport performance level at which athletes have developed high levels of skill proficiency, particularly with regard to

physical skills, with superior execution of both technical and tactical (i.e., perceptual-cognitive) adaptability (Farrow & Robertson, 2017). The high-performance sport setting has also been classified as performance-focused in contrast to athlete-development-focused sport, or sport that is fun-focused (Kinnerk et al., 2021). Elite athletes are defined as athletes who compete at the highest standard of performance (i.e., nationally and/or internationally) and who have had success at the highest level (e.g., medals or titles won). This definition is in line with the findings of the systematic review conducted by Swann and colleagues (2015), which presented a framework to categorize elite athletes along a continuum, and considered athletes as competing at collegiate, professional, and/or Olympic levels (Rice et al., 2019). Other dimensions of the framework defining elite athletes include experience, competitiveness of the country in the particular sport that is being played, and the competitiveness of the sport along an international scale (Swann et al., 2015; Williams et al., 2017). These dimensions allow the classification of elite athletes to go beyond traditional definitions of "expert" athletes in sport (e.g., athletes having at least 10,000 hours of deliberate sport participation in one sport; Ericsson et al., 1993). Within sport psychology literature and similarly related disciplines of research, "high performance sport" and "elite athletes" have been used in conjunction (e.g., Bentley et al., 2021; Gallagher et al., 2017) and are appropriate for defining the context and population of interest for this research.

The high-performance sport domain carries with it a number of demands, pressures, and barriers that can influence concussion recovery. Specifically, physical and cognitive demands of high-performance sport can include, but are not limited to training and competition expectations (e.g., acute and chronic psychological and physical training loads), personal situational factors as impacted by sport engagement (e.g., relationships), perfectionistic performance expectations, and

stress and appraisals of stress (Crowell & Madigan, 2022; Mellalieu et al., 2021). Additionally, the nature of high-performance sport lends itself to inherent pressures on elite athletes. For example, temporal pressures surrounding the time period in which an athlete can make an impact and time in relation to major events can influence athletes' experiences (Gould & Maynard, 2009; McKay et al., 2021). Financial pressures can also exist for elite athletes, including financial rewards related to performance success, scholarship maintenance, or funding to support training efforts (Dos Santos et al., 2020; Henriksen et al., 2020). Furthermore, social pressures around social positioning within a team, the frequency of contact with teammates, social expectations, and the availability of social support can also affect athletes participating in high-performance sport (Purcell et al., 2020; Schubring & Theil, 2014; Stephan & Brewer, 2007).

Beyond demands and pressures, a number of possible barriers that may exist within high-performance sport can impact concussion recovery efforts. For collegiate athletes, barriers related to academic demands, balancing academic and athletic pursuits, and the high risk of burnout are also relevant (Gomez et al., 2018; Ryan et al., 2017). Athletes across the elite athlete spectrum may also have barriers as a result of their occupations (Stephan & Brewer, 2007) and community-oriented responsibilities (e.g., volunteer obligations as dictated by team; Bieganek & Huberty, 2015). Finally, responsibilities to maintain competition readiness, peak fitness levels, and mental toughness may also serve as barriers and/or facilitators to recovery (Coulter et al., 2016; Gorczynski et al., 2017; Plews et al., 2013; Rice et al., 2019). Perhaps related to these challenges, as well as often documented high injury incidence rates, high-performance sport and elite athletes have received a significant amount of both qualitative and quantitative research attention to date (Pennock et al., 2019). This research on SRC experiences in the high-performance sport-domain (e.g., Caron et al., 2013; Guskiewicz et al., 2003; Rice et al., 2018)

has illuminated the existence of these above-mentioned inherencies, and recognizes the influence these factors may have on concussion reporting and other related behaviours. Given the high-demands, challenges, and potential return-to-play pressures that exist at this level, psychosocial support is an important consideration in optimizing recovery efforts, particularly with regard to improving the management of athletes' psychosocial welfare. As such, a greater understanding of the diversity of these factors as they relate specifically to the concussion experience is warranted. Additionally, high-performance sport offers an insightful environment through which to view these experiences, as multidisciplinary support mechanisms are often already embedded (Ahmed et al., 2019). As such, exploring this sport environment is beneficial in illuminating the level of consideration that is currently given for psychological and social aspects of concussions, when access to the highly multidisciplinary healthcare teams that are recommended by the Concussion in Sport Group are more often available.

Personal Interest

I grew up in a family that has been heavily involved and in love with sports for generations. As a relatively introverted child, I found freedom in sports; a freedom to be myself, feel connected with my family and friends, and a space to have incredible fun. Although I played many sports throughout my childhood and adolescence, hockey was by far my favourite. When I was 10 or 11 years old, I heard the Olympics were going to be held in Vancouver in 2010. At that moment, I knew I wanted more than anything to represent our country on the ice. With guidance, encouragement, support, and love from my parents, I began training to reach my dream goal. As a former NHL player, my father knew how to train, and as an excellent coach, he was able to help me learn to take training seriously. He helped me develop a mindset that if I focused on achieving physical training goals, I would inherently train my mind to the point where I believed I was invincible, a belief that served me well as a goaltender. I loved that feeling of invincibility and of getting better every day, all of which was integral to my identity as both an athlete and a person. In hindsight, I realize that my parents gave me opportunities to challenge myself to be better and better, on and off the ice, which opened up doors to many educational and athletic pursuits. When I was 12, the midget team coach of our association wanted me to play with his 15-17-year-old competitive team. When I was 13, I tried out for a junior AA women's team, I made it to the final round of the U-18 provincial team tryouts, and I played my first pro game in the NWHL (now folded CWHL). I continually played a level up from my age group and loved every minute of it. When I was 16, I received an email inviting me to National team tryouts and later that summer, I officially made Team Canada. I will never forget the feeling of standing on the blue line, hearing our National anthem play for the first time while wearing that maple leaf on my chest. My dream had come true and I will never forget that unparalleled feeling. Now, as a

mental performance consultant, one of my aspirations is to help others on route to their dreams, as I want people to experience that feeling of gratitude, inspiration, surrealism, and invincibility.

In the years leading up to and following my time on the National team, I experienced a significant number of injuries, most of which I was able to overcome through training, compression gear and wraps, and physiotherapy. But two injuries significantly affected my mindset: multiple sports hernias/groin tears, and later, a concussion. In my sophomore year at Princeton University, I experienced my first major set of injuries. My athletic therapist and a number of doctors suspected it was a simple groin strain and repeatedly put me through the typical rehabilitation protocols. Between November to March of that hockey season, I experienced emotional, mental, and physical exhaustion from repeatedly rehabbing with nothing to show for it. Finally, a surgeon identified the multiple tears and I had the necessary surgery.

After a year of not playing, I returned to hockey, trying to rekindle my invincible spirit. Then, I suffered the third and worst concussion of my career, spraining my neck and damaging my ligaments and tendons in the process. I was told to do nothing; I no longer felt like myself and found difficulty in doing tasks that I previously found simple, like adding the total on a pair of dice. I did not know if and when I was going to get better; my cognitive state was significantly altered, and I was unable to comprehend whether or not I was making advancements in my recovery. Moreover, I had no support and I felt as though no one understood what I was experiencing. Furthermore, I have seen what has happened to friends and others who have suffered from concussions over the years and how difficult their experiences have been. As such, this research is incredibly important to me, because I believe having psychosocial support through these frustrating times, filled with uncertainty and a complete loss of control and identity, would have been incredibly positive for me and likely for others who have been affected

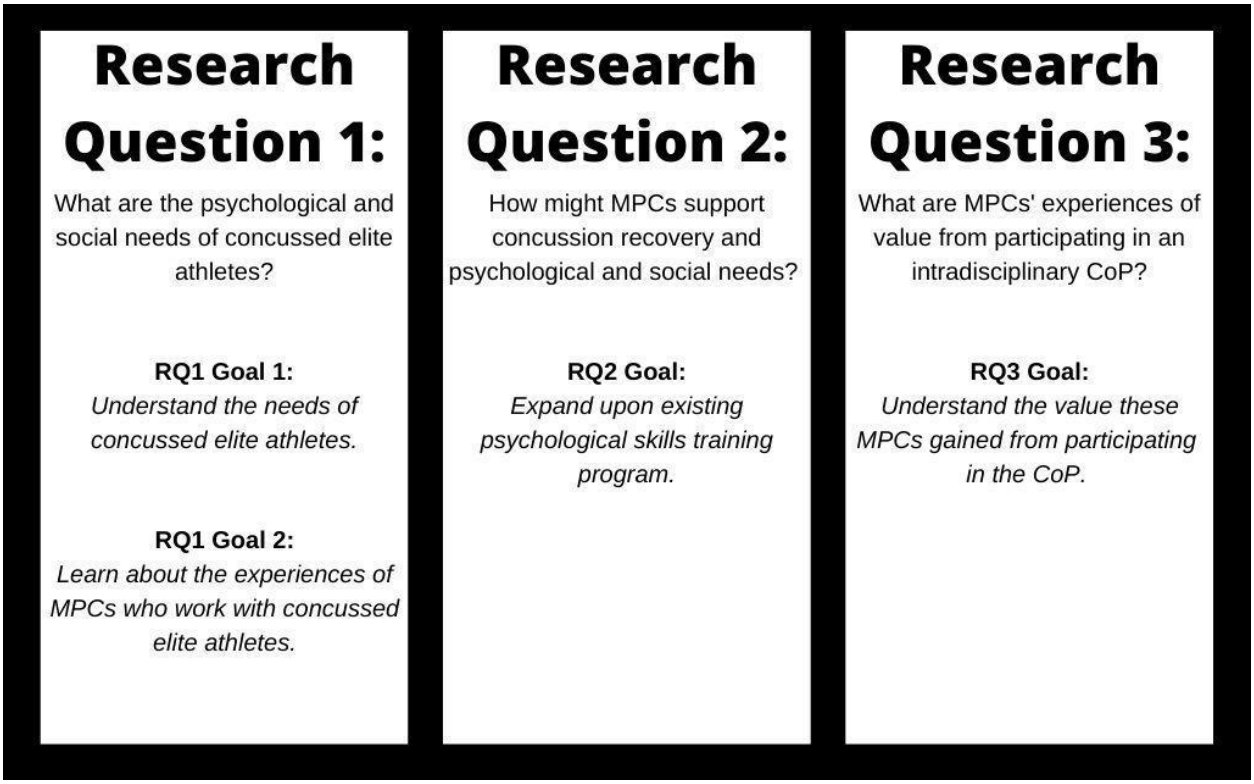
by this challenging injury. As such, I hope to help athletes who are recovering from concussions, and to offer them the support that I know would have made a difference in my athletic career, identity, transition from sport, and my overall mental health.

Purposes and Research Questions

Based on the state of research and the gaps identified within the literature review, broadly defined, the purpose of this research was to identify the psychological and social needs of concussed elite athletes and mechanisms of support to address those needs. A secondary purpose was to explore the value of intradisciplinary collaboration around strategizing these support mechanisms. Three research questions and four corresponding research goals in alignment with these purposes are presented in Figure 1.

Figure 1.

Research Questions



Note. A presentation of the three research questions used to guide this project, along with subsequent research goals.

Research questions 1 and 2 and their corresponding goals were designed to help combine perspectives from athletes and MPCs to shed light on the research purpose of identifying needs

and support mechanisms. Likewise, research question 3 and its corresponding goal are oriented towards the purpose of the understanding value of the intradisciplinary collaboration involved in responding to research question 2.

The next chapters on philosophical positioning, theoretical frameworks, and methodology and methods will serve to orient the reader by defining the approach taken towards answering the above questions.

Philosophical Positioning

The participatory paradigm philosophically positioned this qualitative research project. This paradigm was selected largely due to its ontological, epistemological, and methodological research advantages. Additionally, this paradigmatic positioning offered a contrasting, yet complementary strategic lens to the existing quantitative and post-positivistic approaches which were dominating concussion research at the point of this project's inception. Holistically, this approach was selected to deliberately broaden understandings of the concussion experience and provide insight from the shared experience of those involved in the research (i.e., researchers and participants). This section of the dissertation provides insight into the fundamental underpinnings of the participatory paradigm and ultimately presents how this philosophical positioning oriented and guided this research. Specifically, several philosophical underpinnings of the participatory paradigm warrant discussion in the context of this research. Lincoln and colleagues (2017) comprehensively explore these underpinnings at length. For the purposes of this dissertation however, a selection of these underpinnings are given prominence within this discussion; inquiry aims, the nature of knowledge, basic beliefs (i.e., ontology, epistemology, methodology), and quality criteria are presented.

Inquiry Aims

According to Guba and Lincoln (2005), an inquiry's aim represents the goals of the research, or the "why" behind the conduct of the inquiry. Heron and Reason (1997) indicate that participatory approaches ask questions about the nature of reality, the relationships between the inquirer(s) (i.e., researchers) and the knower(s) (i.e., participants; the individual(s) being inquired-into), and view human life and experience as an intrinsically valuable point of inquiry. This approach emphasizes an important relationship between the researcher and participants, as

such forms of inquiry are "often incomplete without action on the part of the participants" (Guba & Lincoln, 2005, p. 198). As demonstrated in the Purposes and Research Questions for this project, this inquiry aimed at understanding experience, and, as will be described within the chapters on Methodology and Methods and Results, considerable effort was dedicated towards understanding the reality of participants' experiences through ongoing interactions and effortful relationship building.

Nature of Knowledge

To understand the significance of the relationship between the inquirer and the knower, it is important to consider the nature of knowledge. Heron and Reason (1997) consider knowledge as reliant on critical subjectivity. In other words, what we know and how we know it can be understood through four ways of knowing. First, *experiential knowing* considers transformations that occur as a person engages in the process of the inquiry. Second, *presentational knowing* is the expression of insight, whereby patterns of our individual realities are shared in relation to the focus of the inquiry. Third, *propositional knowing* represents descriptions and explanations that provide information about the domain of inquiry, commentaries on diverse outcomes, and descriptions of methods of inquiry. Finally, *practical knowing* includes the enacted skills representing transformative action, various kinds of participation in the inquiry, and collaboration throughout that process (Heron, 1996). Viewing knowledge as this multidimensional and dynamic construct reflects its transformational nature and reliance on the democratic participation of all actors in the research (Lincoln et al., 2017).

Considering the foundation of knowledge as co-constructed meaning (Lincoln et al., 2017), it is possible to consider the depth and breadth of knowledge from an experiential lens:

> The realization of the richness of the mental, social, psychological, and linguistic worlds that individuals and social groups create and constantly re-create and co-create gives rise to the minds of new-paradigm postmodern and poststructural inquirers, to endlessly fertile fields of inquiry rigidly walled off from conventional inquirers. (Heron, 1996, p. 136)

This suggests that knowledge can be understood as a social, cultural, and experiential construction, consisting of each participating mind's conceptual articulation of meaning (Geertz, 1973; Heron & Reason, 1997; Lincoln et al., 2017). As such, the method of inquiry can be diverse and produce multiple forms of data, which can coalesce around a form of consensus (Geertz, 1973; Guba & Lincoln, 2005). In other words, there is a collective aspect to the data, whereby the contributions and interpretations of the data are said to collectively "reveal the actuality of the situations under analysis" (Howell, 2013, p. 95).

Knowledge is also a reflection of power dynamics (Kilgore, 2001). Control must be shared between the inquirers and knowers, as without equal or co-equal control, knowledge cannot be effectively shared nor co-created (Guba & Lincoln, 2005; Lincoln et al., 2017). This principle highlights the necessity of creating safe spaces and the conscious consideration of power structures to facilitate collaboration. Specifically,

> The inquirers' experiential gains, transformations of inner being, can only be conveyed, at their own level, through personal meeting, through being with the inquirers, in their presence. We need to meet them face to face and experience through intimate fellowship, resonant attunement, how their being has been transformed through encounters with the presences and qualities of the inquiry domain, and of the group inquiry process. (Heron, 1996, pp. 105-106)

This intimate fellowship or partnership is at the core of participatory inquiry; without an adequate foundation and power balance, the four types of knowing cannot be adequately explored or understood, as the relational fabric which co-creates knowledge is undermined (Lincoln et al., 2017). Throughout this dissertation, the value and pursuit of this democratic co-creation of knowledge is articulated in an effort to make this explicit to readers.

Basic Beliefs

An important contextualization of the participatory paradigm lies in its ontological, epistemological, and methodological underpinnings. These basic beliefs are described here to further position the inquiry and contextualize some of the decisions made in orienting the research approach.

Ontology

The ontology of a paradigm reflects the researcher's assumptions and worldviews which support their search for and understanding of knowledge (Schwandt, 2015). As demonstrated above, the participatory paradigm recognizes knowledge as a social co-creation of participants' subjective-objective realities (Guba & Lincoln, 2005). Thus, there is a participative reality to the experience which goes beyond objectivity and works towards contextualizing knowledge and experience within the worldviews and realities of those involved (Heron & Reason, 1997). For this reason, time spent building relationships and attempting to understand individual experiences is critical and was intentionally sought throughout the research.

For this research in particular, the doctoral candidate made deliberate efforts to share her experiences with participants (e.g., through noting her experience as an elite athlete, a concussed elite athlete, MPC, and researcher with an interest in concussions in the recruitment texts; see Appendices A, E, & H), to help create an understanding of her perspective, while encouraging

the participants to do the same (e.g., in focus groups; see Methodology and Methods chapter). This ontological perspective also guided the approach to analyzing and disseminating research, as will be demonstrated within the Methodology and Methods and Results chapters of this dissertation.

Epistemology

Schwandt (2015) considers epistemology as "the nature of knowledge and justification" (p. 89). As considerable discussion has already been dedicated to the nature of knowledge, this brief subsection focuses on contextualizing this knowledge. Epistemologically speaking, Heshusius (1994) explains that, for participatory research, truth is the antecedent of interpretation. Thus, the presentation of knowledge or the co-created data that form through discussion and collaboration should be considered for what they are: not a matter or truth, but the result of transactional social relationships and engagements with the cosmos (Guba & Lincoln, 2005). In other words, the interpretations of experience are the data, and in order for that data to be gleaned and shared, opportunities for explanation and further interpretation must be afforded in the presentation of the results. For this research, ongoing interactions between the doctoral candidate, elite athletes, and MPCs were central to the overall inquiry and presentation of results, as will be demonstrated throughout this dissertation.

Methodology

Another important belief held by those leveraging the participatory paradigm is its methodological underpinning. Schwandt (2015) indicates that methodologies are the theories of how inquiries should proceed, involving assumptions and procedures, as well as definitions of why certain problems are worth investigating. Participatory research leverages shared language that is grounded in experience (Guba & Lincoln, 2005), engages participants in face-to-face

learning, as well as learning through application (Lincoln et al., 2017). Additionally, participatory methodologies democratize the process of co-creation by engaging participants as co-researchers (Heron & Reason, 1997). As such, accompanying methods tend to take collaborative approaches (e.g., focus groups, communities of practice) and leverage strategies of inquiry that emphasize democratic participation (e.g., collaborative inquiry). As can be seen in the Methodology and Methods section of this dissertation, these philosophical beliefs and strategies are thoroughly embedded throughout the research process.

Quality Criteria

Often a highly debated concept, the goodness or quality criteria in research represent how researchers seek to determine the quality of an inquiry (Guba & Lincoln, 2005). Burke (2016) presented a discussion around reframing research quality from traditional concepts of validity which are emphasized in post-positivistic research, whereby she differentiates between criteriological and relativist approaches. Participatory approaches often appropriately adopt a relativist approach (Ravenek & Rudman, 2013; Zitomer & Goodwin, 2014), which aims to contextually situate criteria within the specific research context, rejecting a universal approach and replacing it with one that is flexible to the needs of the inquiry (Burke, 2016; McGannon et al., 2021; Sparkes & Smith, 2009). Smith and McGannon (2018) suggest that the criteria ultimately selected for an inquiry are open-ended, meaning they are used as starting points but can shift depending on the context, purpose, methods of inquiry, and the overall research conduct. Examples of criteria that may be adopted can include, but are not limited to: substantive contribution (e.g., does the research contribute to understandings of social context and/or social scientific perspectives?), coherence (e.g., does the inquiry create a complete and meaningful picture? Is the language used across the research in alignment with the philosophical

positioning?), resonance (e.g., does the research affect particular readers through transferable findings?), and transparency (e.g., did the researcher present their interpretations to critical friends?; Burke, 2016). In alignment with a relativist approach, specific criteria were selected for each of the studies within this project and for the overall research. For more information, please refer to the Research Quality section of the Methodology and Methods chapter, as well as the Trustworthiness sections of Articles 1 and 2.

Theoretical Frameworks

The participatory nature of this research lends itself well to diversified theoretical orientations spanning beyond the post-positivistic constructions traditionally used within SRC research. At the time of this project's inception, an inadequate amount of information was available regarding psychosocial support mechanisms for concussed individuals, let alone what could be targeted by such interventions. According to Michalovic and colleagues (2019), the use of theory is currently limited in the concussion space and concussion researchers are encouraged to look externally to other health-related domains for theoretical guidance. Other researchers have called for increasingly diversified approaches to theoretical application and methodology selection within the concussion space, to account for sociocultural influences (Dean, 2020), and to both complement and broaden scholarship on sport injury psychology in general (Wadey & Day, 2022). As a result, the selection of the guiding theories below was limitedly informed by prior literature, but instead, by recent suggestions to see the concussion lens diversify and grow. The identified importance of understanding the psychosocial experience prompts the use of theoretical frameworks which fall further to the right of the paradigm scale (Lincoln et al., 2017). In alignment with the participatory paradigm, theoretical lenses which offer opportunities for exploring the psychosociocultural experience were prioritized. Ultimately, this direction was intended to deliberately diversify the approach taken within this research context.

Previously, psychology of sport injury research has leveraged theories such as personal investment theory (Maehr & Braskamp, 1989), attribution theory (Kelley & Michela, 1980), and the theory of planned behaviour (Ajzen, 1991) to consider specific aspects of the injury experience, including reporting behaviours and adherence to rehabilitation protocols (e.g., Brewer et al., 2000; Duda et al., 1989; Taylor & Marlow, 2001). The use of such theories has

certainly advanced understandings of specific aspects of the psychology of injury experience; however, the related research has placed significant attention on intra-individual experience, resultantly not necessarily accounting for sociocultural influences (Wadey et al., 2018; Day & Humphrey, 2020). In an effort to expand the research exploration lens to account for social and cultural influences in the concussion experience, two theoretical approaches were selected for this research: social learning theory and Bronfenbrenner's ecological systems theory.

Social Learning Theory

Initially developed from the exploration of the situated learning experiences of apprentices, Lave and Wenger (1991) introduced the concept of legitimate peripheral participation in which individuals gradually become full-fledged members of a community. Based on principles of anthropology and social theory (i.e., social cognitive theory; Bandura, 1977; 1986), learning is said to involve the person as a whole, implying

> not only a relation to specific activities, but a relation to social communities – it implies becoming a full participant, a member, a kind of person. […] Activities, tasks, functions, and understandings do not exist in isolation; they are part of broader systems of relations in which they have meaning. These systems of relations arise out of and are reproduced and developed within social communities, which are in part systems of relations among persons. The person is defined by as well as defines these relations. (Lave & Wenger, 1991, p. 53)

Thus, social learning theory as initially discussed by Lave and Wenger (1991) and in the evolutions since that time can be distinguished from social cognitive theory on the basis of their diverging social foci. For Bandura (1986), the social focus is on learning developments related to self-efficacy and self-regulation, for example. These and other dimensions of social cognition

evolve through social interactions like observation and imitation, tying in an element of behaviourism in the learning process. In contrast, E. Wenger-Trayner and Wenger-Trayner (2021) propose their theory's social focus as oriented towards the structuring of learning: "we focus more on the social structuring of learning capability in the human world and the becoming of the person as a social being in that world" (p. 48). Deciphering this further, social learning theory posits the importance of collaboration in learning, in which members within a community support each other on their respective learning journeys. As such, the foundation of this theory is heavily grounded in the assumptions that humans are social beings, knowledge represents competence which is held within valuable enterprises, participation in these enterprises leads to knowing, and learning is to produce meaning through our engagement and experience with the world. Furthermore, we, as participants in these communities, must be reflective regarding our own discourses of learning and the design of learning opportunities to optimize our mutual engagement (Wenger, 1998).

Exploring this further, social learning theory places emphasis on our ownership over learning opportunities and the spaces through which learning journeys can be supported. Accordingly, this theory considers social learning spaces as valuable methods of supporting collective learning journeys. According to E. Wenger-Trayner & Wenger-Trayner (2021), social learning spaces have three dimensions of participation: (1) caring to make a difference (i.e., "participants are there to enhance their ability to do something to affect their world in a way they care about"; p. 17), (2) engaging uncertainty (i.e., "a state of being in tension between caring to make a difference and having a clear path to get there"; p. 21), and (3) paying attention (i.e., "an active dance between accepting, taking in, thinking about, resisting, and refusing feedback. What you hear depends on how you listen to it"; p. 28). Ultimately, social learning spaces place focus

on people's participation, their drive of learning agendas, and can support learning through mutual engagement. Social learning spaces can take a variety of forms, including focus groups under participatory research lenses, whereby researchers engage participants as co-researchers, supporting collective participation in the engagement of uncertainty (E. Wenger-Trayner & Wenger-Trayner, 2021). Under other research lenses, researchers may use focus groups and uncertainty to devise questions and elicit answers of interest, but participants in the research are not necessarily afforded the same opportunity.

Another type of social learning space takes this collective learning opportunity further, emphasizing participants' identification in a shared domain of practice and longitudinal engagement: a community of practice (CoP; Wenger, 1998). Specifically, "communities of practice are groups of people who share a concern, a set of problems, or a passion about a topic, and who deepen their knowledge and expertise in this area by interacting on an ongoing basis" (Wenger et al., 2002, p. 4). Although CoPs may be informally existent or formally recognized, three central dimensions of these communities are consistently innate, including: (1) the mutual engagement of participants within the community, (2) a joint enterprise informed by collective negotiations, and (3) a shared repertoire that enables members to create meaning (Wenger, 1998). Wenger and colleagues (2002) provide guidance for cultivating CoPs by outlining seven principle components. On a simplistic level, these include (1) designing for evolution, (2) opening a dialogue between outside and inside perspectives, (3) inviting various levels of participation, (4) developing both private and public community spaces, (5) focusing on value, (6) combining excitement and familiarity, and (7) creating a rhythm for the community (Wenger et al., 2002). This type of social learning space differentiates itself from others, particularly as

engagements are ongoing, offer continuity to members, and engage participants in cycles of reflection and action (E. Wenger-Trayner & Wenger-Trayner, 2021).

Beyond understandings of learning and the social learning spaces that can support collective learning journeys, social learning theory is grounded in human experience and in changes that occur over time. The discourses, practices, and engagements in uncertainty throughout these engagements reflect and are rooted in historical and sociocultural contexts. Thus, the need to contextualize learning and experience within the confluences of time, cultural influences, and social structures becomes valuable in understanding the transformations that can occur through social engagement. For this research project in particular, taking a social approach appears to be a valuable means for those engaging in the research to learn from each other. Further, this social approach supports the development of insight regarding the influence of value of social engagements within and outside of the project. For this and the above reasons, social learning theory aligns well with the participatory paradigm which frames this research and offers a valuable lens through which participants' experiences in and outside of the research can be considered. It is also complementary to the second selected theoretical framework; Bronfenbrenner's ecological systems theory (EST) acknowledges the influence of social factors on individual experience, and explicitly considers how each individual's experience is shaped by multiple interrelated systems (e.g., communities of inquiry as embedded within CoPs).

Bronfenbrenner's Ecological Systems Theory

Bronfenbrenner's EST conceptually positions an individual within proximal and distal interacting systems of influence. The early conceptualizations of this theory involved four systems within which an individual can be found (Bronfenbrenner, 1977; 1979). The microsystem represents the first level of engagement, which specifically considers the

relationship of the individual with their immediate environment. This could include physical spaces the individual interacts with and considers the intrapersonal experience related to those interactions (e.g., Krebs, 2009). Extending beyond physical spaces, the mesosystem represents the interrelationships between settings of the microsystem. For example, social engagements and relationships, as well as power influences may be involved at this level (e.g., LaVoi et al., 2019). The next embedded system is the exosystem; this system represents the formal and informal social structures which influence the individual. They do not directly contain the individual, but they do directly affect the individual. At the exosystem, we might find policies or regulations which guide behaviour and opportunities (e.g., Scarneo et al., 2019). The fourth system is further removed but has significant influence over the nested systems; the macrosystem considers patterns at the cultural level. Examples from sport literature (e.g., Cooper et al., 2017) identify the macrosystem as representing societal ideologies or sport culture. Years later, Bronfenbrenner extended his theory to encompass a fifth system: the chronosystem (Bronfenbrenner, 1992). This system specifically considers the impact of time on the four nested systems which influence the individual.

Bronfenbrenner's EST has been noted as valuable for exploring the experiences of injured athletes, as it can help account for the complex nature of injury contexts (Bolling et al., 2018). Furthermore, there have been increased calls for sociocultural analyses to explore the lived experience of having a SRC (Dean, 2020); by definition the EST could help respond to such calls. The limited SRC research that has adopted sociocultural lenses has shed light on reasons for not reporting (e.g., perceived lack of resources and conformance to cultural norms in sport; Sanderson et al., 2017), as well as acceptance of risk (e.g., limited time and pressure from others regarding risk taking behaviours; Dean & Bundon, 2019). These widening lenses offer

further opportunity to examine the influence of team and sport culture on other concussion-related behaviours. For example, Michalovic and colleagues (2019) suggested that the EST could be particularly valuable in this regard by supporting explorations on how the systems which encompass the athlete interact. Further, Malcolm (2019a) discussed the importance of these broader considerations, identifying the possible impacts of cultural representations depicted around the athlete's experience, including public health, medical knowledge, and practice. Some concussion researchers have specifically started to implement the EST to increase understandings around the influence of context in decision making, other behaviours, and injury outcomes (e.g., Kroshus, 2019). Considering the purposes of this research and the gaps in psychosocial support, the EST appears particularly valuable in supporting advancements in support strategies. Specifically, Michalovic and colleagues (2019) indicated that examining the interactions across these systems, as well as the systems themselves, could lead to valuable advances in research and practice, including the enhancement of applied interventions and the adaptation of concussion policies and protocols.

Complementary Theoretical Value

Collectively, social learning theory and Bronfenbrenner's EST appear to offer different, yet complementary value to the concussion space. Given the participatory nature of this research project, diverse social engagements within the context of the research support learning and value for those engaged in the research (i.e., co-researchers), revealing the potential for benefit to all involved. Further, the creation of engagement opportunities between co-researchers facilitates the exploration of the lived experience through a relational lens, potentially offering understandings of the experience from multiple dimensions that may otherwise be missed under other theoretical approaches. Herein also lies the opportunity for participants to engage in

something they care to make a difference about, whether it be immediate in their interactions with each other, or further in the future when the results of the research are disseminated and leveraged. This mutual engagement and the related critical discussions further support the exploration of experience as contextualized within systems of influence. As such, the process of learning about these research and concussion experiences becomes multidimensional and innovative, supporting calls for diverse approaches to understanding the lived experience while working towards advancements in support strategies (Dean, 2020). The next chapter offers insight into the methodology and methods applied throughout this project, which leverage these theoretical frameworks and the participatory paradigm.

Methodology & Methods

The following chapter provides an overview of the methodological approach undertaken for the research project presented within this dissertation. Specifically, this chapter includes three sections: (1) collaborative inquiry (i.e., the methodology used), (2) the three phases of the research (i.e., Phases A-C; including information on co-researchers, recruitment, data generation, and data analysis), and (3) research quality. Overall, this chapter serves to provide the reader with a clear understanding of the research in its entirety, while positioning each of the four resulting articles within the project's design.

Of note, the methodology selected for a research project represents the social scientific discourse that occurs between methods and philosophical positioning. In essence, the choice of methodology shapes research, defines data gathering procedures, and influences and/or dictates all other aspects of the research process (Schwandt, 2015; Smith & McGannon, 2017). As such, the selected methodology depends on the research context, proposed research questions, and a number of other important components in the research design (Maxwell, 2013). Similarly, data generation and analysis strategies depend on the above elements and enable the researcher to understand concepts and relationships through ongoing engagement with the research. Therefore, a researcher should immerse themself in the process and engage in data generation and analysis simultaneously (Maxwell, 2013), an action which was deliberately attempted throughout this project.

Collaborative Inquiry

In alignment with the participatory philosophical positioning and the goals of the research, a collaborative inquiry methodology was employed. This methodology has been used in a variety of research contexts concerning learning and professional development (e.g., DeLuca

et al., 2015; Mezirow & Taylor, 2009) and has been described as a valuable methodology particularly when there is a requirement to learn about a new context or solve context-relevant challenges (e.g., Ainscow et al., 2016; Walther et al., 2017), making it ideal for this research. As this project was designed to seek clarity on the lived experiences of athletes and MPCs alike, as well as to inform future professional practice, collaborative inquiry was identified as a practical and appropriate methodology. According to Bray and colleagues (2000), collaborative inquiry as a research process consists of a series of reflection and action episodes through which a group of peers aim to collectively answer questions of importance to them. Based on this definition, three central premises of collaborative inquiry drove the conducted research: (1) peers are considered co-researchers, (2) embedded cycles of reflection and action enable focus on the lived experience, and (3) research questions are of importance to all inquirers (i.e., co-researchers). In the paragraphs below, these three central parts are discussed within the context of the entire research project. More detail regarding the specific conduct of the inquiry within each phase is presented in the section *Phases of Research*.

The first premise of the above mentioned definition of collaborative inquiry corresponds to the relationship between researchers and participants. According to Maxwell (2013), particularly within qualitative studies, the relationship with participants is complex and changing, and the established relationships can either facilitate or hinder aspects of the research process (e.g., design, participant selection, data generation). Collaborative inquiry as a methodology prioritizes and places significant value on creating and maintaining opportunities for communication between all co-researchers throughout the inquiry (Bray et al., 2000). For this research project, this meant that co-researchers (i.e., stakeholders; elite athletes, MPCs, researchers) were invited to participate and contribute to the communication, design, and conduct

of the inquiry. For simplicity when distinction is necessary, the terms ‘initiating co-researchers’ (i.e., doctoral candidate and supervisor), ‘athlete co-researchers’, and ‘MPC co-researchers’ will be used. The term ‘co-researchers’ will be used to represent the above three groups of co-researchers collectively.

While collaborative inquiry typically involves co-researchers across the entirety of a project, this project may be more appropriately classified as a partial form of collaborative inquiry (Heron, 1996). In the specific context of this research, athlete and MPC co-researchers were invited to participate and contribute across one or more phases of the research, but not all. However, contributions by co-researchers across all three phases contributed to the overall collaborative inquiry (i.e., contributions made by athlete and MPC co-researchers in Phases A and B were brought forward to Phase C). Additionally, not all athlete and MPC co-researchers elected to continue participation throughout the course of the inquiry despite invitations to do so, and the degree to which each co-researcher was involved varied across phases. This distribution of engagement in the overall inquiry will be discussed in the *Phases of Research*, and is considered to be an advantage within this project (see below).

Also of note, the degree to which co-researchers engaged in the research varied depending on the phase of the inquiry and their own continued willingness and availability to participate. According to Kubiak and colleagues (2015), within social learning spaces such as those created within this research, participants may not always be considered full participants. Instead, they may elect to participate in a narrow spectrum of the research activities, despite having a significant connection with and/or interest in the research question(s). Along this process, the doctoral candidate strove to be as flexible as possible given these varying levels of engagement and opportunities. To do this, suggestions from other participatory research studies

which proposed offering options for meeting times, prioritizing participants' needs, and facilitating open and trustworthy communication were enacted (e.g., Thomas et al., 2016).

In addition, athlete and MPC co-researchers were involved at different points of the inquiry intentionally. This was partially determined on the basis that the lived experience of each group of co-researchers was valued and that the initiating co-researchers sought to first understand these experiences independently from each other (i.e., athletes' experiences separate from MPCs' experiences). By attempting to understand the lived experience in this way, the initiating co-researchers were afforded the opportunity to engage thoroughly with each group of athlete and MPC co-researchers to prioritize each groups' voice. Generally, a major challenge in research is understanding the lived experience of participants (Rogoff et al., 2018) and it is difficult to do so when the language the participants are speaking is distinct from the language the researchers are using. This is not to compare, for example, French and English speakers, but rather to explain that language derives from participants' realities, culture, and context. Language and experience may not be effectively explored if the co-researchers do not encourage mutual understanding. As such, combining groups of co-researchers from different contexts (e.g., elite athletes and MPCs) may initially be a disservice to the co-researchers for several reasons. First, the lived experience of each group independently may not be as well understood as the use of different language across groups may affect the interpretation and appreciation of each groups' own experiences. Second, if there are perceived and/or actual power structures or imbalances present across contexts and/or groups, this may impact how much participants are willing to share (Grant et al., 2008), along with creating an additional risk for self-presentational biases (Akkerman et al., 2012). As MPCs are often part of integrated support teams and/or work closely with coaches (Maher, 2021; Richard et al., 2021), a perceived power imbalance between

stakeholders (i.e., athletes and MPCs) is plausible. Cumulatively, combining groups initially may detract from one of the greatest assets to this methodology: its ability to empower participants.

Participatory approaches have also often been used in contexts where it is "simply not enough to understand or describe participants' words and recommend solutions from afar" (Schinke & Blodgett, 2016, p. 92). Taking it a step further, these approaches can shift power dynamics by promoting a democratic environment in which researchers and participants work collaboratively toward shared goals (Golob & Giles, 2013). For this reason, participatory approaches like collaborative inquiry are ideal for contexts involving marginalized and/or oppressed populations (Cahill, 2004) in bringing a voice to those who have been disempowered (Fetterman, 1994), and have the power to challenge existing power structures (Dworski-Riggs & Langhout, 2010). Many examples of participatory approaches (e.g., collaborative inquiry) with such populations and purposes exist, including work with women (e.g., McIntyre, 2003), physically-disabled populations (e.g., Kitchin, 2000), and HIV positive individuals (e.g., Rhodes et al., 2010). More recently, collaborative inquiry has been used to help bring a voice to populations who have traditionally faced inequity and/or barriers in sport (e.g., women and disability sport coaches; Duarte et al., 2020b; Kraft, Culver et al., 2021). To date, the voices of concussed elite athletes and MPCs have been minimally represented in the literature. In an effort to embrace, encourage, and empower each of these groups individually, the initiating co-researchers felt that it was important to first understand athletes' and MPCs' individually lived experiences, before attempting to understand how they might fit together. Thus, while all co-researchers contributed to the overall collaborative inquiry, the degree and timing of their participation varied depending on the phase of the research.

Regarding the second premise of collaborative inquiry, deliberate effort was dedicated to creating and facilitating opportunities for reflective practice and action on lived experiences within and outside of the research. Participatory methodological approaches like collaborative inquiry are explicitly beneficial in this regard, as they enable researchers to seek understanding regarding the lived experience of those involved (Frisby et al., 2005). According to Bray and colleagues (2000), "the cycles of action and reflection that are the heart of collaborative inquiry reveal this strategy to be a powerful approach to learning from experience and, simultaneously, a valid method of conducting inquiry into the nature of human experience" (p. 10). Similar to what can be seen in other forms participatory research, a dynamic process of engagement exists in these cycles, whereby co-researchers thoroughly question a context, refine techniques, implement strategies, develop new plans, investigate the delivery and evaluation of said plans, and reflect on that experience to inform the next cycle (McIntyre, 2008). Thus, the research process continues to be adaptable, fluid, and reflexive, enabling the research to evolve as knowledge evolves through ongoing engagement.

Another advantage to this collaborative approach is that the nature of human experience can be understood through interactions; gleaning insight into social, cultural, and historical contexts beyond the purely observable phenomenon (Israel et al., 1998). Additionally, the reflective nature of this particular methodology enables a dynamic learning process in which co-researchers can shift focus and adapt approaches to better meet the goals and expectations of the co-researchers (Botcheva et al., 2009). In congruence with this tenant, the timing and form of group reflection and action opportunities evolved as the research goals and participation evolved together. Individually prompted reflection and action opportunities were offered to the co-researchers, as well as a variety of group reflection and action opportunities (see *Phases of*

Research). By facilitating individual and group discussion opportunities, we were able to gain insight into both elite athletes' and MPCs' experiences of participating in the research, which also supported our understanding of the concussion experience. Collectively, this methodological approach empowered co-researchers to be involved in the conduct and experience of the research. Ultimately, this approach results in a shift in the research dynamics, moving away from an orientation of being conducted *on* people and towards one where the research is conducted *with* them. Additionally, this dynamism of learning, reflection, action, and evolving interaction prioritizes those involved in the research; and has been shown to create thoughtful change as a result of participation through shifts in individuals' thinking, attitudes, and/or behaviours (Tricket & Ryerson-Espino, 2004). As such, the research has potential not only to impact those who engage with the results of the project, but importantly those who are involved in the generation of the data themselves.

Finally, the third premise considers the research questions. These research questions, while initially developed by the initiating researchers, worked towards facilitating the exploration of the athlete and MPC co-researchers' own questions and experiences. As such, research questions were shared with all co-researchers at the beginning of each phase. The goal of this was two-fold: (1) to see if athlete and MPC co-researchers shared these questions and (2) to understand their reasons for participation and how those reasons could be addressed through participation. Once again, this approach aligns more with a partial form of collaborative inquiry, as the initial research questions were determined prior to engagement with athlete and MPC co-researchers. To accommodate this partial form of inquiry while also respecting and placing emphasis on the value of the co-researchers' engagements, the doctoral candidate made deliberate efforts to ensure that every co-researcher had a voice (Fetterman, 1994; Wenger et al.,

2011). For example, inviting athlete and MPC co-researchers to explore the questions which were important to them (i.e., their own questions and those proposed by the initiating co-researchers which aligned with athlete and MPC co-researchers' reasons for participating), worked toward the goal of each co-researcher being legitimately equal relative to the other stakeholders (Bray et al., 2000). This required the doctoral candidate to adopt an initially highly facilitative approach to help translate the interests of individuals within the group into a group-oriented form (Bray et al., 2000). In addition, as participatory approaches like collaborative inquiry require a sustained commitment, this initial engagement and check-in also served to plan and assess athlete and MPC co-researchers' potential willingness early in the process.

Further, strategies to work towards an increasingly equal relationship were enacted throughout data generation to help minimize the potential power imbalance imposed by the initiating co-researchers proposing the initial research questions. For example, this involved contending with potential barriers (e.g., time, challenges of connectedness across co-researchers, and trust) and working toward creating a safe and friendly environment facilitative of group learning (Duarte et al., 2020a; Jones & Wells, 2007). Addressing these promotional facets of a democratic research environment also worked towards collaboration on shared research, personal and professional goals (Golob & Giles, 2013), and supported the challenging of any power imbalances through ongoing discussion (e.g., Dworski-Riggs & Langhout, 2010). While these strategies are recommended across forms of participatory research, it is important to recognize that it is difficult to create and follow a formalized or uniform model of inquiry, given the ever-evolving nature of relationships and the inquiry itself (McIntyre, 2008). As such, data generation and other processes that promoted democratic relationships were based on generally shared

processes of participatory research (Shalowitz et al., 2009), but were selected specifically for the research context, and evolved as the research evolved.

Phases of Research

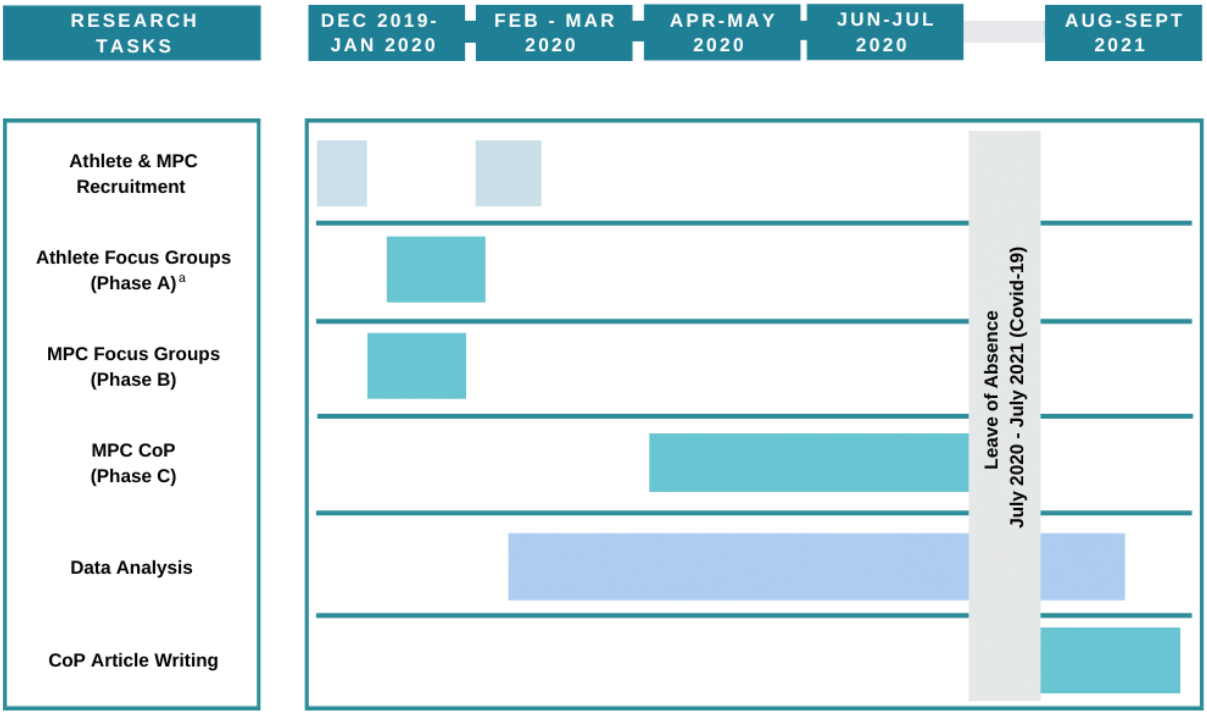
The following section presents the three phases of this doctoral research (Phases A-C). Each subsection below reports on a phase of the research process and includes information on the co-researchers involved, as well as recruitment, data generation, and data analysis methods. The sequence of the research was not linear, in that some phases overlapped with each other. As a result, a Gantt chart demonstrating the timeline of recruitment, data collection, and data analysis for Phases A through C is presented in Figure 2. In addition, the research phases evolved as co-researchers engaged in the research. As such, some notes are made throughout this section to indicate where the research evolved from the originally proposed project. Also of note, the project was originally intended to include six phases (see Modifications chapter for additional information). These three additional phases would have focused on the implementation and evaluation of the intervention developed based on Phases A through C. As a result of evolutions within the research and the Covid-19 pandemic, these latter three phases were removed with the consent of the supervisor and committee members.

Phase A: Athlete Focus Groups

The goal of Phase A was to understand the needs of concussed elite athletes. Ultimately, this goal was intended to help address Research Question 1 (i.e., What are the psychological and social needs of concussed elite athletes?). As such, all recruitment, data generation, and data analysis methods listed below were selected specifically to address this goal and research question. These methods align with the participatory nature of this research, as well as with the chosen overarching methodology of collaborative inquiry. These methods have been used in a

Figure 2.

Timeline of Research



Note. Research tasks across the three phases of the project are presented. The pale blue in the recruitment phase indicates that this phase was largely led by the doctoral candidate. The teal indicates the co-researchers learned and worked together (across Phases A, B, and C, as well as in the writing of Article 3). The bay blue in the data analysis phase indicates that the doctoral candidate and supervisor had a larger role, but that athletes and MPCs were involved to varying degrees throughout this process. The break in the timeline represents the 12-month leave of absence that the doctoral candidate completed due to the Covid-19 pandemic.

[a]Prior to and subsequent to the athlete focus groups, elite athletes engaged in reflections and discussions with the doctoral candidate that collectively produced the results of Article 1. For simplicity's sake, the timeline of the focus groups alone is demonstrated in the Gantt chart.

variety of research contexts, including sport psychology (e.g., exploring lived experiences through focus groups; Goldman & Gervis, 2021) and concussion research (e.g., thematic analysis to understand psychosocial experience; Daly et al., 2021).

Invited Co-Researchers: Phase A. To explore the lived experience of SRCs, elite athletes who experienced SRCs were targeted for Phase A. As described in the Review of Literature chapter, elite athletes fall along a continuum, compete at the highest standard of performance (i.e., nationally and/or internationally) and have had success at the highest level (e.g., medals, titles won; Swann et al., 2015). Although we are using the term "elite athlete", it should be noted that the term "high-performance athlete" was used in recruiting. This decision was made based on the terms used by national sport organizations (e.g., Hockey Canada) and government funding sport organizations (e.g., Own the Podium) in order to remain consistent with the language used within these specific domains.

Recruitment: Phase A. Following ethical approval, elite athletes were recruited for participation in Phase A using a combined approach of purposeful and snowball sampling (Patton, 2015). Specifically, athletes were recruited if they were a current or former elite athlete (as defined by Swann et al., 2015) and had experienced at least one SRC (more information on recruitment procedures and inclusion criteria can be found in Article 1). The number of elite athletes recruited for this phase was determined based on the guidance provided by Guest and colleagues (2006), who suggest that a minimum sample size of six within homogenous groups can be sufficient for achieving saturation. Fifteen athletes were initially contacted via email at the beginning of December 2019 (see Appendix A for the emailed recruitment text). Ten ultimately consented to participate in the research (see Appendix B for the consent form that was

reviewed and discussed prior to obtaining informed consent from each athlete). For general demographic and concussion information related to each of the athletes, please refer to Article 2.

Data Generation: Phase A. In alignment with collaborative inquiry, focus groups were identified as an appropriate method for sharing knowledge between initiating and athlete co-researchers. Focus groups, like other interview data generation methods, are valuable as they offer the opportunity for conversation. According to Brinkmann (2013), it is through conversations that humans can get to know each other; interview methods like focus groups are excellent sources of information as they provide rich and new knowledge about personal aspects of experience, as well as social context. Furthermore, interview methods under participatory lenses offer flexibility for co-researchers to explore unplanned avenues of questions as curiosity and conversations evolve through interactions, leading to unanticipated insights. Focus groups in particular are excellent at prompting these interactions, as the objective of this data generation strategy is to stimulate conversation among co-researchers in a group. It has been suggested that having at least three groups in a study is beneficial (Smith & Sparkes, 2016), so a minimum of three focus groups were planned.

In December of 2019, five semi-structured focus groups were held, averaging 58.1 minutes and ranging from 46 to 88 minutes in length. Initially, three groups of three or four athletes were scheduled, but due to conflicts and rescheduling challenges, only two athletes were present in each focus group. A script of nine questions (with probes; see Appendix C) was used to facilitate these conversations, but interactions between athletes and the doctoral candidate facilitated further discussion beyond these pre-identified conversational points. Subsequent to the focus groups, the doctoral candidate transcribed the focus group recordings, requested the athletes review the transcripts, and asked follow-up questions that emerged from the

transcription process and/or discussions from other focus groups. Seven of the ten athletes then participated in informal individual discussions with the doctoral candidate about their experiences in the focus groups. Within these discussions, athletes shared additional information on their psychological, social, and cultural experiences with concussions. Further conversations were held around the narratives that were created for Article 1 (which incorporated pilot interview data from November 2018).

Data Analysis: Phase A. The data generated from the focus groups resulted in 52 single-spaced pages which were initially analyzed (starting in February 2020) using an inductive thematic analysis (Braun et al., 2016; see Appendix D for a description of each of the six phases comprising this analytic approach). Thematic analysis is a widely used and valuable data analysis method with regards to identifying patterns in data, particularly within participatory research lenses (Braun et al., 2016). The results of this analysis were interpreted and contextualized with the results of a similar analysis process that was undertaken for Phase B (see Article 2). Subsequent to some discussion between the doctoral candidate and her supervisor, it was decided that a thematic narrative analysis would be appropriate for delving deeper into the athletes' lived experiences, as it would enable the initiating co-researchers to consider the cultural and relational fabric that shaped these experiences (Smith, 2016). This extended beyond the originally proposed research plan in order to evolve based on research developments and newly identified needs (i.e., an exploration of cultural factors influencing concussion recovery). As such, the new analysis involved both inductive and deductive thematic coding (using Bronfenbrenner's EST) and resulted in the creation of two composite narratives (see Article 1).

Phase B: MPC Focus Groups

The goal of Phase B was to learn about the experiences of MPCs who work with concussed elite athletes. This goal was intended to help address a different aspect of Research Question 1 (i.e., What are the psychological and social needs of concussed elite athletes?), in that it attempted to consider concussion experiences from the lens of a supporting practitioner. Once again, all recruitment, data generation, and data analysis methods were selected to help address this goal and research question. These methods are also aligned with the participatory research paradigm and collaborative inquiry methodology.

Invited Co-Researchers: Phase B. The co-researchers sought for inclusion in Phase B were MPCs. As discussed in the Review of Literature, MPCs are professionals who specialize in the delivery of mental performance and/or sport psychology techniques (Kraft, Seguin et al., 2021). This service delivery may include the provision of PSTPs targeting psychological and social factors (McHenry et al., 2021). Theories, principles, and intervention techniques are catered towards the individual seeking consulting services and are largely selected based on the MPC's professional consulting philosophy and education (Castillo et al., 2022). Within high-performance sport, MPCs are often asked to work with individual athletes, teams, coaches, and organizations to develop mental performance competencies (i.e., fundamental, self-regulation, and interpersonal competencies; Durand-Bush et al., 2022). MPCs are also asked to collaborate with professionals from other disciplines and expertise domains to optimize the performance and well-being of the athlete(s) (e.g., McHenry et al., 2021; Van Slingerland et al., 2019). As mentioned within the Review of Literature chapter, MPCs are also in a position to offer support during injury management and rehabilitation (Ildefonso et al., 2019; Thompson & Schary, 2021). As such, the opportunity to engage MPCs in a discussion about their experiences of supporting

concussed elite athletes, while simultaneously being able to converse about psychological and social variables from a lens of professional expertise, was deemed invaluable to this project.

Recruitment: Phase B. MPCs were recruited for this phase of research using purposeful, criterion, and snowball sampling (Patton, 2015). MPCs were recruited if they were a professional member of the Canadian Sport Psychology Association and/or the Association for Applied Sport Psychology, if they were publicly known to be working in high-performance sport, and if they had worked with one or more elite athletes with a SRC. This latter criterion could not be established prior to sending recruitment texts due to the confidential nature of the athlete-MPC relationship. As such, MPCs who were working in sports with high concussion incidence rates (e.g., American football, rugby, ice hockey) were targeted. Once again, a minimum sample size of six was desired for this relatively homogenous group based on the guidance of Guest and colleagues (2006) regarding saturation. A recruitment text (see Appendix E) was sent via email to 20 MPCs meeting the first two criteria. Nine of these MPCs met all three criteria and elected to participate in the research, subsequent to their review and discussion of the consent form (see Appendix F). For some general demographic and consulting experience information about these MPCs, please refer to Article 2.

Data Generation: Phase B. The data generation strategy employed for Phase B is very similar to that applied in Phase A. MPCs participated in one of three focus groups in December 2019. Two to four MPCs were involved in each focus group, with focus groups lasting an average of 79 minutes, and ranging between 66 and 98 minutes. These focus groups followed a 16-question semi-structured guide (see Appendix G) and evolved as a result of discussion and engagement between the doctoral candidate and MPCs. Following each of the focus groups, the doctoral candidate transcribed the sessions and sent these to the MPCs for review. Additionally,

follow-up questions raised as a result of the doctoral candidate's transcription and/or reflection process, or as a result of the discussions held in the other focus groups, were also sent to the MPCs at this time. Some MPCs engaged in additional informal conversations with the doctoral candidate that provided further experiential insight, and some also elected to continue on to Phase C of the research.

Data Analysis: Phase B. The transcription of the MPC focus groups produced 64 single-spaced pages of data. These were analyzed beginning in February 2020. This analysis process once again involved inductive thematic analysis (Braun et al., 2016; see Appendix D). The generated themes were combined with the results of the initial thematic analysis process that was undertaken for Phase A (see Article 2) to help shed light on concussed elite athletes' psychological and social needs.

Phase C: MPC CoP

Phase C was unique in this research as it was designed to address two goals. The first goal was to expand upon an existing PSTP (Seguin & Durand-Bush, 2019) and to address Research Question 2 (i.e., How might MPCs support concussion recovery and psychological and social needs?). To accomplish this goal, a CoP was formed, and the analyzed and anonymized contributions of co-researchers in Phases A and B were shared to help inform the CoP's work. As this research opportunity also represented a novel research endeavour, a second goal and research question were considered. This second goal was to understand the value that the MPCs might gain from participating in this CoP. This responded to Research Question 3 (i.e., What are MPCs' experiences of value from participating in an intradisciplinary CoP?). As with the above two phases, all recruitment, data generation, and data analysis methods listed below were

selected specifically to address these goals and research questions while aligning with both the leveraged paradigm and overarching methodology.

Within this section, some additional information is presented regarding recruitment, data generation, and data analysis procedures. This is partially because these were not discussed in Article 3 and limitedly presented in Article 4, and as this Phase corresponds to two research questions, additional information is warranted to situate the research more comprehensively within the overall project.

Invited Co-Researchers: Phase C. As with Phase B, MPCs were once again identified as the desired co-researchers for Phase C. Beyond the rationale provided for their inclusion in Phase B, MPCs are often responsible for delivering psychological skills training and offering psychosocial support to athletes (Schinke et al., 2020; 2021). Resultantly, their perspectives and experiences of delivering psychosocial support to concussed elite athletes were deemed essential to the research.

Recruitment: Phase C. MPCs who met the same criteria as those who participated in Phase B were recruited in February 2020. Those who had previously participated in Phase B were prioritized for involvement in the research to provide additional opportunity for engagement if interest was demonstrated. Recruitment texts (see Appendix H) were sent once again via email. Ultimately, seven MPCs demonstrated interest in participating. All reviewed, discussed, and signed the consent form (see Appendix I) prior to participating in the research. One MPC ultimately discontinued participation (after three meetings) as a result of inevitable schedule changes during the Covid-19 pandemic. Of note, the doctoral candidate and supervisor also met the criteria for inclusion and participated fully in the CoP. Including the MPC who discontinued participation, MPCs were predominantly female (six female, three male) and had

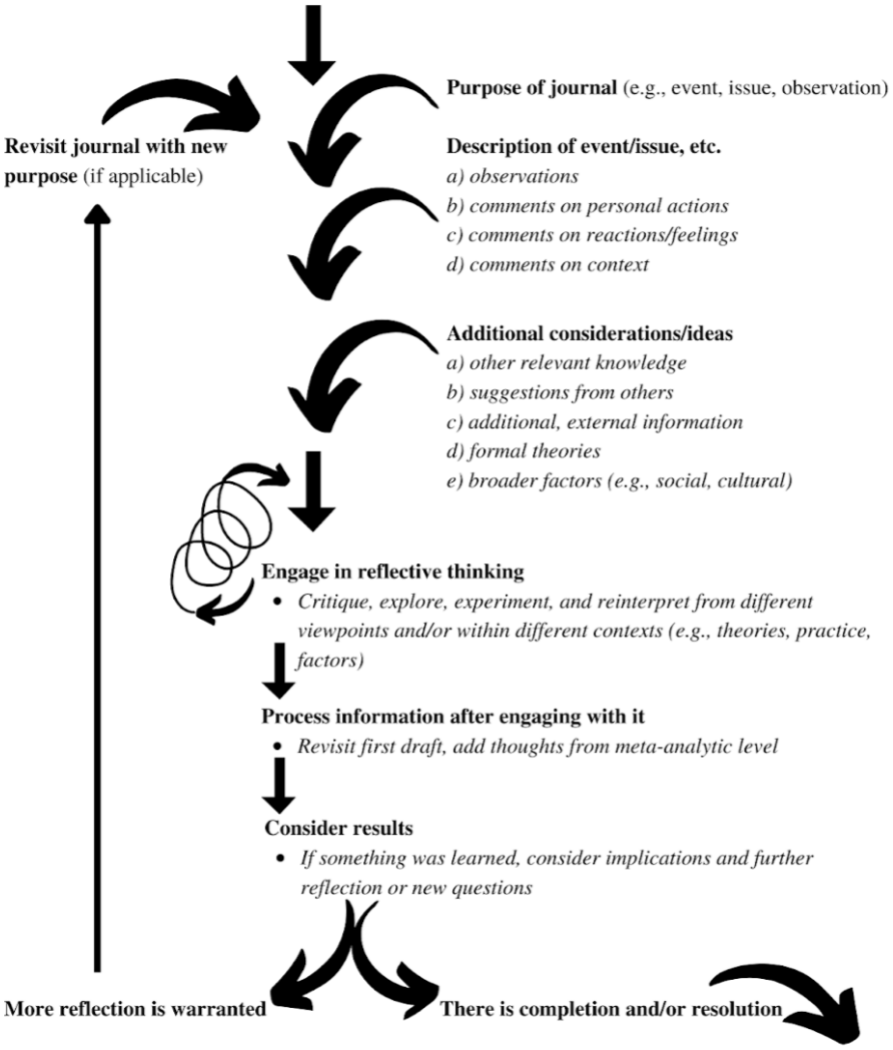
been working as MPCs for four to 30 years. The MPCs worked in a wide range of sport contexts (e.g., wrestling, soccer, rugby), and were either embedded in a team/sport organization or working independently. Research on CoPs has often articulated the value of including members with diverse experiences and backgrounds to enhance the effectiveness of CoPs (McLaughlin, 2003; Wenger et al., 2002; E. Wenger-Trayner & Wenger-Trayner, 2021). As such, the diversity of consulting experiences and contexts was an asset to this project, and visibly helped promote critical thinking and discussions between co-researchers.

Data Generation: Phase C. Phase C involved a number of data generation methods. The primary method of data generation was the CoP meetings themselves. At first, the initiating co-researchers intended on having three or four meetings over a period of two months. Based on the engagement of the co-researchers and evolutions in the goals for the CoP, the CoP extended beyond this initially planned period. Collectively, the CoP met eight times over a period of four months (April-July 2020). These meetings averaged 80 minutes in length (ranging from 60 to 90 minutes), with the meeting times determined using When2Meet and hosted over Zoom. These meetings were video and audio recorded to enable all co-researchers to revisit the meetings at their convenience, should they desire. These recordings were uploaded to the CoP's shared and secure platform (i.e., Basecamp) to enable members to view meetings if they were unable to attend. Of the eight meetings, only three did not have full attendance (two MPCs missed Meeting 1, one missed Meeting 4, and one missed Meeting 5). These recordings were also used by the co-researchers as data for Article 3. Specifically, upon completing each meeting, the doctoral candidate reviewed the recordings to take notes, engage in deeper reflection (see Figure 3 for the reflective process which guided her research journal), and identify possible points of discussion for the next meeting. Relevant notes, reflections, and points of discussion were then brought

back to the group at the outset of the next meeting to engage the co-researchers in further discussion.

Figure 3.

Reflective Journaling Process



Note. The modified reflective journaling process used by the doctoral candidate is based on the original model developed by Moon (1999). This process was enacted to help support research transparency, facilitate the candidate's self-monitoring process, and add to her participative experience. While this journaling process is only presented in Phase C, this reflective journaling was enacted across the entire research project.

Beyond this, the engagement and planning of each meeting was left to the co-researchers as a team. Thus, methods of inquiry, data generation strategies, and discussion points were determined by the collective. Ultimately, the collaborative approach of the CoP influenced how meetings were approached and which goals were targeted for each meeting. Figure 4 presents a timeline of these meetings and briefly highlights the goals and strategies used in each.

Data were also generated throughout the CoP in relation to the third research question. For one, Basecamp has a venue whereby weekly questions could be posed to members of the group. To help facilitate reflection on the part of the MPCs, as well as discussion outside of meetings, the following weekly question was posed: "What is something that you took away from this meeting and/or have applied to your practice?" Six pages of single-spaced responses were compiled as a result of members' weekly reflections on this question. MPCs were also asked to complete value creation stories (see Appendix J) when they felt they wanted to explore and/or reflect on a specific meeting or experience more in depth. Each member of the CoP completed one or two value creation stories over the course of the CoP (resulting in 10 single-spaced pages of data). Finally, at the end of the CoP, each MPC was asked to complete a personal value narrative (see Appendix K) to reflect on their experience in the CoP as a whole. Each co-researcher completed one of these, resulting in another 12 single-spaced pages of reflections. In addition, some of the MPCs interacted with the doctoral candidate via email to add to their reflections and/or share some other experiences during the CoP or after the CoP had ended. Together, these provided another six single-spaced pages of data. Collectively, MPCs' reflections on their experiences within the CoP resulted in 34 single-spaced pages of data.

Data Analysis: Phase C. Two different data analysis approaches were taken to analyze the data generated in Phase C. Regarding Research Question 2 (i.e., How might MPCs support

concussion recovery and psychological and social needs?), a qualitative content analysis was undertaken (Hsieh & Shannon, 2005; White & Marsh, 2006). Qualitative content analyses

Figure 4.

CoP Meeting Focal Points and Strategies

Note. Presentation of CoP timeline, focal points of each meeting, and strategies to achieve the CoP's collective goals. This does not include the meetings after July 2020 to create Article 3.

require the researcher to continually be a central instrument in the analysis process, whereby they must seek to explore latent and context-dependent meaning (Altheide & Schneider, 2013; Merriam & Tisdell, 2016). In other words, qualitative content analysis goes beyond the quantification of meaning units that is typically associated with positivistic forms of content analysis, and delves more deeply into the contextual understanding of meaning (Margolis & Zunjarwad, 2018). This approach allowed the doctoral candidate to use the recordings and her reflective notes to derive meaning units directly from the meetings and her own reflections, through a process of interpretation and cyclical engagement with the data. According to Maxwell (2013), engaging with research by listening to recordings is an opportunity for analysis that enables a researcher to develop initial conceptualizations of themes and relationships. Specifically, the doctoral candidate considered the conversations held within the CoP meetings and interpreted meaning from these conversations, which led her to create classes of codes and categories (Hseih & Shannon, 2005). As the focus of this analysis was towards identifying strategies and considerations for the co-creation of Article 3, themes that were generated from this content analysis had a specific focus in mind: facilitate the writing of the article through content from the collaborative engagements thus far. For additional information on the content analysis method employed for this research, please refer to Appendix L. The themes from this content analysis included: phases of injury, interdisciplinary collaboration opportunities, interventions and support mechanisms, challenges to the athlete, challenges to the MPC, and the MPC's scope of practice. Once this analysis was complete, the doctoral candidate shared these themes with the MPCs who elected to contribute to Article 3. This content analysis, as well as the initiating and MPC co-researchers' own reflections and perspectives, ultimately informed the approach and content of Article 3.

In relation to Research Question 3 (i.e., What are MPCs' experiences of value from participating in an intradisciplinary CoP?), a deductive thematic analysis (Braun et al., 2016) was applied to the weekly and emailed reflections, value creation stories, and personal value narratives using the Value Creation Framework (E. Wenger-Trayner & Wenger-Trayner, 2021). Please refer to Appendix D for the process that was undertaken to perform this analysis. In addition, specific questions that have been proposed across publications using this framework were leveraged to support this analysis (Wenger et al., 2011; E. Wenger-Trayner & Wenger-Trayner 2015; 2021; see Appendix M).

Research Quality

There were a number of steps that we took to augment the research quality throughout the conduct of the project. In alignment with the philosophical underpinnings of this research, a relativist approach to discerning criteria that were specific to the research was employed (Burke, 2016). This approach to research quality allows researchers to identify certain criteria that align with the goals, context, and design of an inquiry, and allows readers to assess the quality of the research using such criteria. In order for a relativist approach to be enacted appropriately, there must be a thorough understanding of the co-researchers' contexts, engagement in critical reflective practices, and an approach that ascribes to informed, on-going decision making (Smith & Caddick, 2012). Based on these aspects, the selected criteria are: substantive contribution, width, coherence, credibility, and transparency.

First, this research adopted the criterion of substantive contribution in order to disseminate the research within a contextualized manner (Burke, 2016; Richardson, 2000). In action, this involved seeking not only to understand athlete and MPC co-researchers' experiences of SRCs and/or working with concussed elite athletes, but also in our presentation of the data to

broader audiences. In using a narrative approach in Articles 1 and 3, the results of our inquiries are presented in a way that situates them within broader contexts (e.g., Article 1 - sociocultural integration using Bronfenbrenner's EST; Article 3 - presentation of intervention opportunities following existing theoretical injury models).

We also aimed for research width and coherence to provide a comprehensive picture of the data generation and analysis processes, thereby creating a meaningful and complete picture for external interpretation (Burke, 2016). To enhance research width, each of the four articles, and this dissertation as a whole, were thoughtfully conceptualized within the broader context of SRCs, inclusive of both theoretical and practical landscapes (e.g., Article 2 - integration of results into existing concussion management recommendations; Article 4 - an exploration of the value of the MPC CoP to the research project and potentially to the broader field of mental performance). Beyond a thorough understanding of the context, actions towards this criterion include the strategically enacted data generation methods (e.g., focus groups, reflective discussions, narrative reviews) and a variety of interpretational lenses (e.g., Article 2 - athlete and MPC perspectives, Article 1 & 3 - theoretical and practical contexts). The latter of these strategies also speaks to internal and external coherence, whereby each article is intended to create a clear and meaningful picture (Burke, 2016; Lieblich et al., 1998). Specifically, this section of the dissertation is deliberately dedicated towards demonstrating how each of the research questions and goals fit together (i.e., internal coherence), while the articles and rest of this dissertation collectively work towards meaningfully situating the experiences of the co-researchers within the context of theory, research, and practice (i.e., external coherence).

Research credibility and transparency were also essential to this project. For one, the participatory nature of the study, participant engagement, member reflections, and the input of

critical friends demonstrate the significant amount of time the doctoral candidate spent within this context, as well as demonstrate how the research process was collaborative and appropriate for this specific context (Burke, 2016). Furthermore, the intentional presentation of methodological strategy, presentation, and discussion of results encompasses the initiating co-researchers' efforts to engage critically with the data while demonstrating different perspectives, explanations, and interpretations of experiences (Burke, 2016; Tracy, 2010).

Finally, our collaborative approach offered an opportunity for different forms of triangulation (i.e., investigator/critical friends, theory, methodological, data), which were also used to enhance the quality of our research across these five criteria (Flick, 2017). According to Flick (2007),

> Triangulation means that researchers take different perspectives on an issue under study or–more generally speaking–in answering research questions. These perspectives can be substantiated by using several methods and/or in several theoretical approaches. Both are, or should be, linked. Furthermore it refers to combining different types of data on the background of the theoretical perspectives, which are applied to the data. As far as possible, these perspectives should be treated and applied on an equal footing and in an equally consequent way. (p. 41)

Although the above definition ascribes to a more criteriological approach to research quality, some forms of triangulation were employed to enhance research coherence. For example, the bracketing interview conducted prior to the ethics file submission helped make the doctoral candidate aware of some preconceptions she had going into the research (e.g., sports to be considered and why; Rolls & Relf, 2006; Tufford & Newman, 2010). Furthermore, by engaging with other researchers as critical friends, we were able to be increasingly critical and clear with

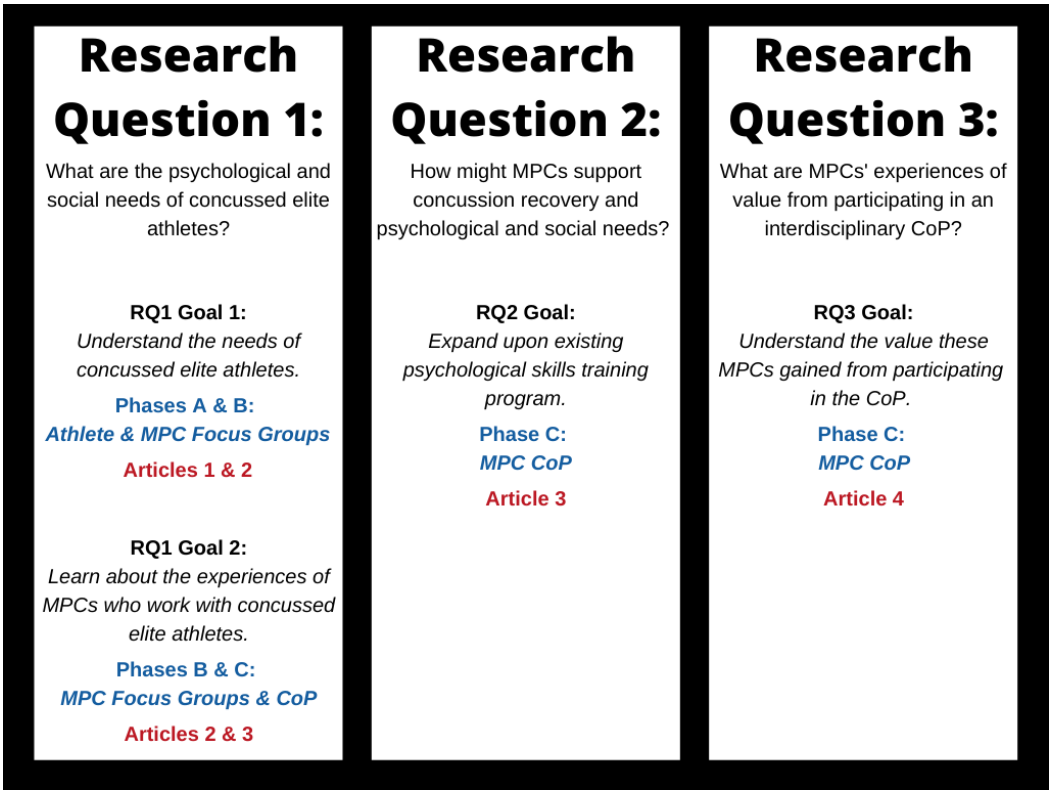
our data generation and analysis procedures, which enhanced the level of our understanding and arguably provided further transparency to both the co-researchers and our audiences (Smith & McGannon, 2017). Another example of this triangulation within the research process was our effort to triangulate perspectives from elite athletes and MPCs in relation to psychological and social needs (see Article 2). By considering these perspectives together, we were able to help situate perspectives with contextual information from the lived experiences of both elite athletes and MPCs.

Results

This chapter presents the main results of this qualitative research project. It has been divided into four articles, which respond to the research questions outlined in the chapter on Purposes and Research Questions. To visualize how the articles fit within the context of the research questions and goals, please refer to Figure 5 below. All articles are formatted and structured based on the specifications of the journals in which they were published (Articles 1, 2, and 3) or submitted to for publication (Article 4).

Figure 5.

Purposes, Research Goals, and Results



Note. This figure expands on Figure 1 of the chapter Purposes and Research Questions chapter to contextualize the results from the articles and situate them within the overall research project. The phases of data generation corresponding to each goal are reflected in blue, while the articles responding to each research question and goal are indicated in red.

Article 1: The Lived Experience of Sport-Related Concussion: A Collaborative Inquiry in Elite Sport

Seguin, C. M., & Culver, D. M. (2021). The lived experience of sport-related concussion: A collaborative inquiry in elite sport. *Journal of Applied Sport Psychology,* Advance online publication, 1-22. https://doi.org/10.1080/10413200.2021.1998804

Abstract

Sport-related concussion(s) (SRCs) pose a complex problem to researchers and practitioners alike. The psychological and emotional experience of these injuries requires individualized and multidisciplinary intervention to promote wellbeing and effective recovery (Bloom et al., 2020). These interventions require a thorough understanding of the SRC experience. Thus, collaborative inquiry, a novel approach in the SRC domain, was employed to give athletes a voice in how their experience is portrayed and understood within the research and applied communities. Data were generated over two years through on-going discussion and reflection between the researchers and twelve elite athletes who experienced SRCs. Athletes advocated for a broader view of their injury that considers the interplay of sociocultural factors and the individual's psychosocial experience. Mutual engagement through interviews, member reflections, focus groups, follow-up emails, and further reflective conversations generated two composite narratives. These narratives are interpreted using Bronfenbrenner's Ecological Systems Theory to underline the interplay of factors: (1) microsystem (athletic identity), (2) mesosystem ((dis)trust in relationships), (3) exosystem (concussion protocols), (4) macrosystem (sport culture), and (5) chronosystem (timing related to major events and recovery). Through this unique combination of methodology and theory within SRC research, we aim to highlight opportunities for applied intervention, multidisciplinary collaboration, and future scientific exploration.

Key Words: *lived concussion experience, composite narratives, Ecological Systems Theory*

Lay Summary: Elite athletes who experienced concussions collaboratively created stories which highlight the complexity of concussions. These stories and accompanying analysis are intended

to help practitioners and researchers further understand some of the psychological, social, and cultural factors that contribute to injury experience and recovery.

Practical Implications: This article aims to facilitate an understanding of some of the complex and interacting factors that impact an elite athlete's experience with concussion. Through a narrative exploration of athletes' experiences and a multi-systems theory, this article highlights potential targets for applied sport psychology and rehabilitative interventions. Specifically, psychological, social, and cultural barriers and factors are identified as potential intervention areas, all of which have been largely ignored in existing return-to-sport protocols.

Sport-related concussions (SRCs) represent a significant problem for researchers and practitioners. A large part of this problem is the complexity of the injury; often, SRCs result in idiosyncratic symptom presentations that encompass physical, psychological, and social symptoms (Kontos, 2019). As a result, a one-size-fits-all approach is difficult to create and would likely be ineffective. In the last five years, qualitative research on athletes' lived experiences of SRCs has helped incite a better understanding of this potentially life-changing experience (Malcolm, 2019b) by inquiring into the nuanced aspects of these injuries (Caron et al., 2017). These inquiries have illuminated numerous psychosocial aspects of SRCs, including demands, pressures, and barriers to recovery (e.g., Caron et al., 2013; Liston et al., 2018; Rice et al., 2018). For instance, Valovich McLeod and colleagues (2017) reported on several psychosocial areas that are affected by SRCs and post-concussion syndrome, including experienced changes in the athletes' role in their team environment (e.g., not being able to contribute, feeling as though they are letting the team down), and increased irritability and emotionality. Research on athletes' lived experiences of SRCs has also offered insight into experiences of social isolation and grief (Cassilo & Sanderson, 2019); feelings of de-humanization (Dean, 2019); loss of identity resulting from activity limitations, minimized contact with teammates, and absence from the sport environment (Caron et al., 2013); and a scarceness of social support (Engström et al., 2020). Together, research on the lived experiences of SRCs has helped clarify some of the significant psychological, social, and cultural issues for the athletes and the sport systems within which they reside.

Beyond the identification of issues, symptoms, and explorations of experiences, a strength of research on the lived experiences of SRC has been its ability to broaden our understanding of the injury. Traditionally, post-positivistic and quantitative research has been

overwhelmingly prevalent in the concussion domain (Caron et al., 2013). Explicitly speaking, SRC research and management strategies have originated predominantly from the health care setting, which has foregrounded the efforts and opinions of those within the medical (e.g., medical doctors, neurologists) and specialized health domains (e.g., athletic therapists). For instance, all 36 Concussion in Sport Group members who authored the most recent SRC consensus statement are experts from either or both domains (i.e., McCrory et al., 2017). This consensus statement has been used to inform most, if not all SRC management guidelines worldwide. While these contributions have greatly advanced our understanding of physical aspects of SRCs, Liston and Malcolm (2019) argue that the dominant biomedical voice in SRC management has failed to provide a holistic view of the injury. In a recent position statement, further concern for this biomedical dominance was put forward by Bloom and colleagues (2020), who stated that current "graduated return to sport steps largely ignore psychological variables that are involved in athletes' return to sport following a concussion" (p. 9). Accordingly, research on lived SRC experiences has been effective in enhancing researchers' and practitioners' understanding of SRC-related psychological factors, and can be an insightful source for advancing intervention (Bloom et al., 2020).

As research on the lived experience of SRC is still fairly new, the approaches taken to understand this experience have only started to diversify and explicitly acknowledge the undeniable interplay between identities and social environments (e.g., Caron et al., 2021). Moreover, extending the scope of these investigations to encompass examinations of social and cultural factors appears to be an important next step in providing a more holistic view of SRCs. Thus far, much of the research on the lived experience of SRC has attempted to classify experiences into individual themes (e.g., psychological symptoms). Beneficially, this approach

has identified several factors within experiences (e.g., identity threats) which may contribute to the complexity of the lived experience. However, these more traditional models of thematic organization have been recently criticized as they "presuppose that these experiences can be neatly separated in the first place" (Ventresca, 2020, p. 180). Given the importance and prominence of these factors (i.e., psychological, social, and other elements which contribute to the lived experience), researchers must continue to diversify their approach and avoid relying on examinations of these factors in isolation. Instead, SRC investigations have an opportunity to strategically consider these factors in the context of their interactions and interrelationships. Such explorations are critical to concussion prevention, management, and intervention discussions as these multidimensional explorations of the lived experience are necessary for advancing SRC theory and practice. To our knowledge, SRC research has not yet taken this next step of deliberately exploring the interconnected nature of the psychological, social, and cultural factors that shape the lived experience. An understanding of how these factors influence each other could help identify significant issues for the athletes and the sport systems within which they reside, and inform researchers and practitioners on opportunities for creating and improving multidisciplinary and collaborative care.

Bronfenbrenner's Ecological Systems Theory

To explore this multi-factorial dynamic of athletes' SRC experiences, Bronfenbrenner's Ecological Systems Theory (EST; 1977; 1979; 1992) provides a theoretical lens through which psychosocial and sociocultural influences, and the athlete's overall lived experience can be qualitatively examined (Onwuegbuzie et al., 2013). This theoretical application offers a unique opportunity to understand the interconnected aspects of the experience, in contrast to traditional models of SRC research described above. Specifically, Bronfenbrenner's model comprises five

interacting environmental systems through which the athletes' lived experience can be viewed. These five systems include: the microsystem, the mesosystem, the exosystem, the macrosystem, and the chronosystem (see Table 1 for a definition of each system and relevant sport research examples).

Bronfenbrenner's EST has been suggested as a potentially beneficial lens through which to explore the experiences of injured athletes (Bolling et al., 2018), and appears ideal for viewing the often-complex lived experience of concussed athletes (Kroshus, 2019). In particular, the wide-range of symptom experiences, the multifaceted approaches to concussion management, and the diverse trajectories of return-to-play and transition from sport are influenced by factors across the EST's environmental systems. As such, the purpose of this article is to create a greater understanding of the lived SRC experience through a psychosocial lens, in order to illuminate sociocultural factors and implications that can directly impact the concussed athlete. Resultantly, examining athletes' lived experiences of SRC through the EST specifically supports the two primary goals of this research: (1) identify intrapersonal, interpersonal, and cultural factors that influence experience and recovery, and (2) provide a clear depiction of how these factors not only influence each other, but are intertwined in creating the SRC experience.

Methodology and Methods

To address these goals, a novel approach to researching the lived experience of SRC is necessary. As earlier mentioned, much of the work done in the field of SRC has been post-positivistic in nature. In contrast, the current study is framed within the participatory paradigm, which relies on a process of interaction between the inquirer and the inquired into (i.e., actors; Lincoln et al., 2017). Ontologically speaking, shared dialogue, reasoning, and interpersonal agreement facilitate the social construction of knowledge, which foregrounds the reality of

Table 1.

Bronfenbrenner's Ecological Systems Theory and Sport Research

Bronfenbrenner's Ecological Systems Theory			
System	**Definition**	**Sport Examples**	**Sport Literature**
Microsystem	The physical domains, locations, and activities with which the athlete directly interacts, and the intrapersonal experiences related to those interactions.	Sport facilities, practices, athletic identity	Krebs (2009)
Mesosystem	The interrelationships that exist between the settings of the microsystem.	Coach-athlete relationships, power dynamics	LaVoi et al. (2019)
Exosystem	Formal and informal social structures that do not contain the athlete directly, but affect and/or encompass the settings in which an athlete is found, and resultantly influenced.	Sport policies, regulations, laws	Scarneo et al. (2019)
Macrosystem	Patterns of the culture or subculture that overarch the microsystem, mesosystem, and exosystem.	Sport culture, athlete expectations, societal ideologies	Cooper et al. (2017)
Chronosystem	Represents how time impacts the nested relationships within all systems.	Transitions and changes through an athlete's life span	Kerr et al. (2019)

Note. This table presents the five systems of Bronfenbrenner's (1977, 1979, 1992) EST. The definitions for each system derive from Bronfenbrenner's EST, and have been paraphrased to align with the sporting context. Examples of themes that may fall into each system, as well as examples of sport literature that have applied these systems to sport are also included.

experience as participative and balanced between the subjective and objective (Heron & Reason, 1997). The sharing of experiences, practical knowledge, and engagement in critical subjectivity allows actors to explore their lived experiences and examine the relationship between what is currently known, what can be known, and how this knowledge can be found. This epistemological perspective of holistically exploring experience by considering the relationships between 'truth' and 'interpretation' relies on the shared responsibility for engagement and action, and the transformative nature of knowledge through social interaction (Lincoln et al., 2017). Thus, to understand the lived experience, we must seek to understand how athletes experience SRCs psychologically, socially, and culturally, while also understanding the social and cultural influences which contribute to the creation of this experience.

To explore the lived experiences of SRCs, a collaborative inquiry methodology was selected to give a voice to athletes so that their experiences of SRC could be communicated and understood in an accessible way. According to Bray and colleagues (2000), collaborative inquiry is an active process of engagement in reflection and action through which a group of peers (i.e., athletes and researchers) work together to address a question, or series of questions, that are of relevance and importance to the group. Specifically, three central tenets of Bray and colleagues' (2000) definition support the framing of this study. First, (1) peers (i.e., athletes and researchers) are considered co-researchers[1]. Fundamentally, this entails collaborative decision making, discussion, and reflection. Second, (2) cycles of reflection and action are at the heart of this methodology, revealing this strategy as "a powerful approach to learning from experience and, simultaneously, a valid method of conducting inquiry into the nature of human experience"

[1] Note: for readability and comprehension purposes, we will use "athletes" and "researchers" when distinction is necessary and "co-researchers" only when we are addressing both simultaneously.

(Bray et al., 2000, p. 10). Finally, (3) research questions are of importance to all inquirers, supporting the notion that each co-researcher is legitimately equal.

Co-Researchers

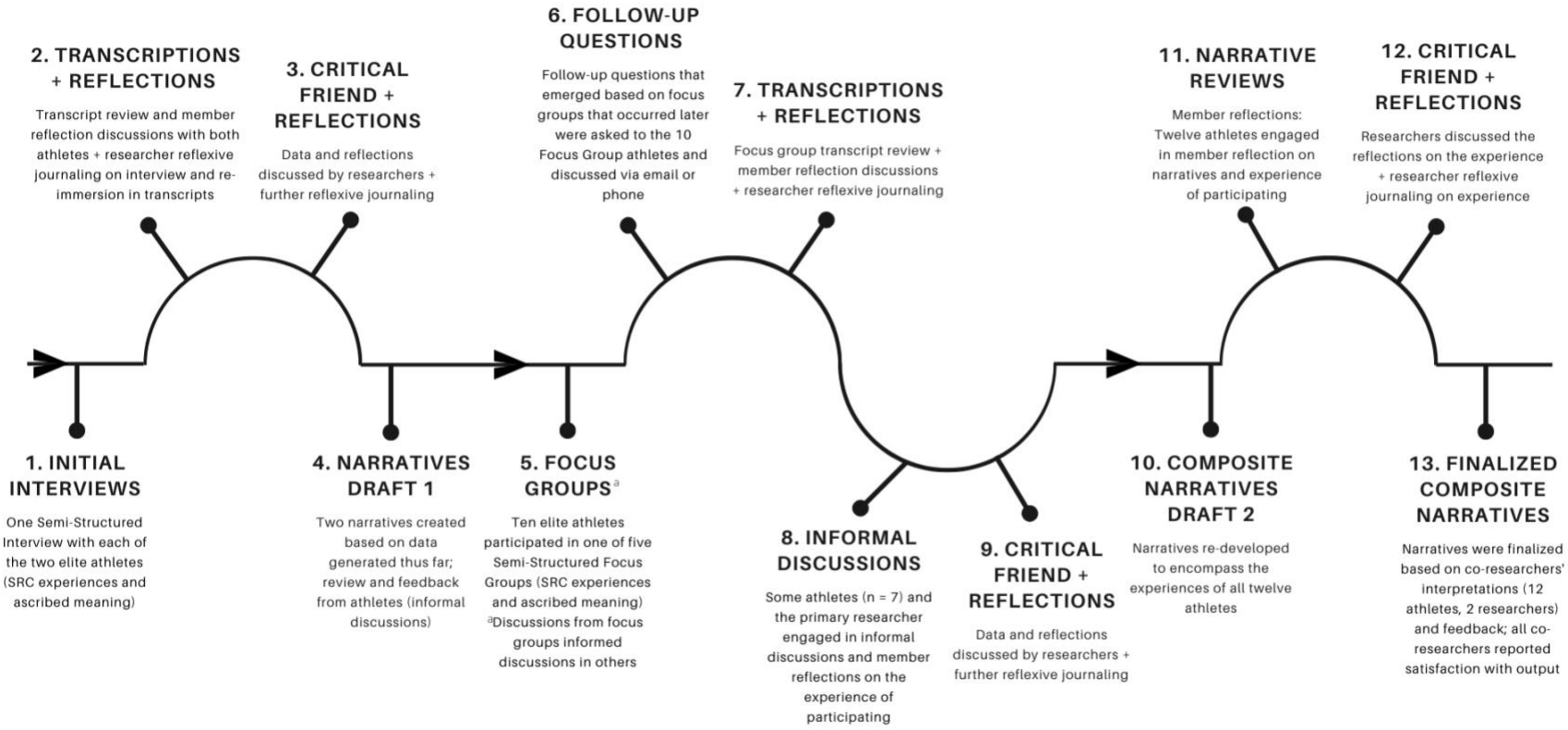
All co-researchers were current or former elite athletes (as defined by Swann et al., 2015) who experienced SRCs. The researchers' athletic (i.e., successful-elite) and injury experiences prompted their interest in this topic, guided their research approach, and drove their desire to enable athletes' voices in the communication of their stories to a broader audience. During the inquiry, it became apparent that the athletes had similar motivations, making the goal of sharing their experiences to improve the experiences of others central to their decision to participate. Athletes were recruited using purposeful and snowball sampling (Patton, 2015). These methods were chosen based on the need for athletes to: (1) be former or current elite athletes, and (2) have experienced at least one SRC. Thus, athletes who had publicly discussed their SRC experiences, or were known to have had at least one SRC, were sent a recruitment text via email. Subsequently, some athletes provided a referral network through which additional athletes meeting the same criteria were also recruited. This resulted in the recruitment of 12 current and former athletes (8 male, 4 female) who sustained SRCs (Range: 1-5 diagnosed; 1-15 suspected/undiagnosed) while competing in elite sport. Symptom durations for these concussions were reported to range from two days to more than two years; all were asymptomatic at the time of participation. Based on Swann et al.'s (2015) classification of elite athletes, two athletes met the criteria for world-class elite status, four for successful-elite, three for competitive-elite, and three for semi-elite. Finally, these athletes competed in sports with high incidence rates for SRC (i.e., American football, ice hockey, lacrosse, snowboarding, and rugby), and competed out of Canada, the Czech Republic, the United Kingdom, the United States, and New Zealand.

Procedure

Prior to participation, athletes were sent a consent form to review. Before data were generated and the consent forms were signed, athletes were reminded of their rights to anonymity and confidentiality, and had the opportunity to ask questions. The primary researcher maintained that there were no right or wrong answers to the questions and stated that the goal of the interview was to understand each athlete's experience over the course of their SRC(s). Data were generated through a number of methods that took place over two years. Cumulatively, this involved two one-on-one interviews, five focus groups, 24 member reflections, and 31 informal discussions (athlete participation varied based on athlete location and/or availability). This section will present these procedures in detail. For a visual illustration of the overall inquiry, Figure 1 highlights 13 key phases of the overall process and illuminates how and when reflection and collaboration were integrated throughout the inquiry. Initial data were collected in March of 2018, following ethical approval from the University's research and ethics board. Two elite athletes participated in semi-structured interviews (Phase 1) to share their experiences with SRCs and the meaning they ascribed to these experiences (Smith & Sparkes, 2016). One interview was conducted in-person and the other over a virtual platform (i.e., Skype; M = 51.5 min, Range: 44-59 min) due to the athletes' proximity to the researchers at the time of the participation. The athletes were asked questions about their athletic experience (i.e., sport, level of competition, years at level), concussion history (i.e., number of diagnosed/undiagnosed concussions, description of incidence(s), symptom experiences, length), impacts on athlete (i.e., impact on person, athletic career, and relationships; hardest part of being concussed), and support received or desired (i.e., protocols, who provided support, what kind of support, helpfulness of support, support they wished they had). These interviews were audio recorded and transcribed

Figure 1.

Research and Narrative Development Timeline



Note. Timeline demonstrating the events and interactions of the collaborative inquiry that lead to the creation of the composite narratives. Of note, all twelve athletes were co-researchers at various phases during the study. The first two athletes participated in Phases 1, 2, 4, 11, and 13. The other 10 athletes participated in Phases 5, 6, 8, 11, and 13.

verbatim. As part of the reflection and action process, participants were sent their transcripts for review (which resulted in minimal requested changes; e.g., to enhance the clarity of the odd statement), along with follow-up questions that arose during transcription (Phase 2) and researcher reflections (Phase 3). Once these interviews were reviewed and discussed, an early analysis and initial write-up were completed (Phase 4).

Following additional ethical approval, another phase of data collection was conducted in December of 2019. To extend our experiential understanding in this phase, we invited 10 athletes to participate in an in-person or virtual (i.e., Zoom) semi-structured focus group (Phase 5). This helped facilitate the sharing of experiences and further stimulated discussion through athlete interactions. This approach also allowed the primary researcher to adopt more of a facilitative role and enabled the athletes to share their multiple viewpoints, while also building from each other's contributions (Smith & Sparkes, 2016). These focus groups (n = 5, *M* = 58.1 min, Range: 46-88 min) followed the same semi-structured interview guide as described above; they were transcribed verbatim and sent back to the participants for review. Follow-up questions identified during transcription and questions that arose in other focus groups were also sent to the athletes to prompt further reflection on their own personal experiences (Phases 6 & 7). After having been exposed to the group context, we hoped that having an opportunity to reflect on their experience in the focus group and on how their story had been conveyed within that setting could provide further introspective insight. Athletes provided feedback through informal in-person and/or virtual individual discussions (Phase 8), which either elaborated on psychological, social, and/or cultural aspects they presented initially, or simply confirmed a closed-ended question or their appreciation for the accuracy of the transcript. These discussions were held between the co-researchers to enhance understanding and interpretation of the data being generated. The primary

researcher also used reflexive journaling (Moon, 1999) throughout to engage deeply in her understanding of the data, her experience of the research, and the overall inquiry process (Phases 9 & 12).

Thematic Narrative Analysis

For this research, a thematic narrative analysis was chosen to help express the cultural and relational fabric of the athletes' lived experiences in and over time (Frank, 2010; Smith, 2016). This form of analysis was selected to explore the innerworkings and relationships of the many complex aspects of the SRC experience.

To conduct this analysis, a cyclical and iterative process was undertaken, comprising seven steps (Smith, 2016), which were revisited and refined throughout the research. The first of these was writing, whereby the primary researcher started creating a scaffold for the two narratives based on the discussions with the first two athletes. This writing process is perhaps the most cyclical of the seven steps, as it was continuously done throughout the collaborative inquiry; the initial scaffolds were revisited, expanded, revised, and reconstructed as the primary researcher engaged more and more with the co-researchers (see Composite Narratives section below). The second step was transcribing the interviews and focus groups; each interview and focus group was transcribed within a week of each data generation point. Once transcripts were written and discussed with the participating co-researchers, all data files were organized using NVivo 12. The fourth step involved familiarization through narrative indwelling, which included reading the transcripts, listening to the corresponding audio several times, and engaging in a reflective process whereby the primary researcher immersed herself in the stories by critically thinking about the experiences independently and through discussions with critical friends. The fifth step involved both the inductive (i.e., based on interview and focus group data) and

deductive (i.e., as informed by Bronfenbrenner's EST) identification of the narrative themes and thematic relationships. Within this analysis, narrative themes and thematic relationships (e.g., similarities and differences between athlete experiences) were highlighted and summarized based on apparent and interpreted meaning. This allowed for inductive codes (e.g., disconnect between athlete and support network) and deductive codes (e.g., exosystem-level role of concussion protocol in recovery) to be linked and further clarified within the evolving drafts of the narratives (e.g., the inclusion of quotes and data illustrating how perceived and actual disconnect is amplified by lack of knowledge translation between support network and athlete). Additional discussions with co-researchers helped the primary researcher engage more deeply with these interpretations, which supported the sixth step of describing each theme (e.g., exosystem: concussion protocols) and interpreting them within the context of the story (see the Discussion section for a presentation of the themes identified in the fifth and sixth steps, and the researchers' interpretations of the data and narratives). This also meant inquiring into what the individual and collective stories were about (i.e., psychosocial experiences of concussion when returning to, and transitioning from elite sport) and engaging critically with research on the lived experience of concussion (e.g., research identified within the introduction of this article) to enhance these interpretations. The final step was representing the results in an insightful and engaging manner (i.e., composite narratives to help audience understand the interpreted psychosocial experience).

Composite Narratives

The primary researcher incorporated the themes that were developed during the thematic narrative analysis (i.e., interview and focus group themes situated within the systems of Bronfenbrenner's EST), as well as the corresponding direct and paraphrased quotes that informed these themes to create two composite narratives (Phase 10). These story-analyst

narratives were developed to clearly express the lived experiences of athletes through a relational lens, and to give athletes a voice in how their experiences are presented; a process which has been promoted as accessible and powerful, while preserving confidentiality and ensuring anonymity (Wertz, 2011; Willis, 2019). This is of particular importance given the multifaceted aspects of injury experience and recovery (Kontos, 2019) and the experiential translation that is lacking in SRC research at this time.

This development process was on-going throughout the two years of the inquiry. Specifically, an initial draft of these narratives was developed after the first two interviews (each representing the experience of a single athlete). These narratives were sent for review and discussed one-on-one with the primary researcher. After the focus groups, the initial analysis of the interviews was revisited and combined with the analysis of the focus groups. The initial narratives were then significantly revised to encompass the experiences of the additional 10 athletes. This required considerable revision as aspects from each athlete's experiences were spread across the two narratives. While some athletes had more concussion incidences and/or longer recoveries to discuss, the primary researcher made explicit efforts to ensure both unique and similar elements of each athlete's story were reflected across and within the narratives. Both newly constructed narratives were sent to each of the 12 athletes for their input (Phase 11). They were also explicitly asked if they felt their story was represented within either or both narratives. Most athletes reported satisfaction, while some requested slight modifications (e.g., further emphasis on specific details of experience). Once a final draft of each narrative was created based on their feedback, the narratives were sent for review and discussion once again. The athletes were satisfied with the representations of their experiences at this point, and

acknowledged them as insightful interpretations of their experiences. These final narratives are below (Phase 13).

Trustworthiness

The epistemology, ontology, and transformative nature of knowledge within the participatory paradigm, as well as the goals of the research guided the adoption of a relativist approach to trustworthiness. Importantly, criteria are selected to contextually align with the goals and methods of the inquiry and encourage reflexivity on the part of the researchers and readers (Burke, 2016). Through deliberate consideration of research quality and the intention behind the dissemination of this work, the criteria of coherence, credibility, and transparency were adopted.

Coherence was established internally (i.e., inductive analysis, explicit presentation of thematic relationships through narratives; Smith, 2016) and externally (i.e., exploration of identified need for holistic examinations of the lived SRC experience; e.g., Bridel et al., 2020; Caron et al., 2017) throughout the research. Credibility was established through engagement with the participants prior to and after each interview and focus group, and member reflections were conducted at various points in the research process (i.e., during transcript/created-narrative reviews). Lastly, transparency was ascertained through the use of critical friends (i.e., second author and two researchers outside the project), as well as through storytelling to promote greater understanding of the lived experience for researchers, athletes, and readers alike.

Results

The first narrative (Evan) presents a return-to-sport experience, while the other (Rachel) recounts a transition-from-sport experience. When reading these narratives, we encourage the audience to avoid trying to neatly separate psychological, social, and cultural factors from the experience, and instead consider the experiences holistically. As an extension of the participatory

nature of this research, we are encouraging readers to participate in the interpretation of the stories and understand them within their own context and worldview. Later, the discussion section will provide our interpretation of these experiences by explicitly separating components of these experiences using Bronfenbrenner's EST, while considering their interactional nature.

Evan: The Rugby Player

Growing up, Evan played a lot of sports, but rugby had a special place in his heart; Evan lived for rugby and everyone knew Evan as "the rugby player". Through high school, he was a star athlete and a leader on the team; he loved the thrill of making a timely tackle or a big play to score a try. In his sophomore year, he started training more seriously, and in his final year of high school, he made the U20 National Team; a dream come true for both him and his family.

Rugby's a tough sport, but Evan had always been the example of 'tough'. He trained hard off the field and performed well on, even when injured. He was very familiar with being hurt, having broken bones and strained muscles. He followed the rehabilitation programs to a tee, reaching each goal he, his physiotherapist, and the team set. Being injured and playing rugby went hand-in-hand, and if you were too weak to handle pain, you didn't play the sport. Evan was driven to perform, to be an exemplary player, and to support his team on route to a championship, and that meant working just as hard at rehab as he did to perform on the pitch. When Evan joined the National Rugby Sevens team a year later, he was in peak shape and playing his best rugby yet. At 20 years old, Evan made his debut on the pitch and continued to play on the squad for three years. The team qualified for the Olympics and had high hopes.
In the quarterfinal game, Evan went in for a tackle and the back of Evan's head was hit hard by his teammate's forehead, leaving them both bloody. Off the pitch, the team's medical doctor and athletic therapist attended to their wounds. Evan felt a bit dizzy and had a headache but shrugged

it off. His doctor gave him some Advil and asked him how he was feeling. Evan thought to himself: 'this is THE Olympics! I can't let the guys down'. Evan turned to his doctor, swallowing the Advil and said: 'I'm fine doc, just a light knock on the head, no big deal' and returned to play. He had never been diagnosed with a concussion despite suspecting a couple over the years, but he was fairly certain this was one. He played through the game, but he knew something wasn't right; his headache grew sharper and he was getting dizzier by the minute.

After the Games, Evan continued to hide his symptoms from his coaches, teammates, and family. He didn't see the point in worrying them over an injury; 'I've had so many others that were worse than this' Evan said to himself, 'I just need to push through it, and I'll be fine'. He knew spots on the National Team roster were limited and somebody was ready to step up who was as hungry to play as he was, so keeping the news away from the team would help him maintain his position. He didn't ask for help and continued to push. He worked so hard to convince others that he was fine that he started believing it himself. Even when his brother called him out for acting weird, Evan brushed it off, saying he was just down about losing at the Games. It wasn't entirely true, but Evan thought: 'Have I changed? What's wrong with me?'

About a year later, Evan still felt off but kept training and performing for himself and his teammates. During a club match, Evan took a hit to the head from an opponent's shoulder and was knocked out. This time, there was no hiding that something was wrong; it was clear to everyone that he had been unconscious, so the decision to reveal symptoms was not his own. And somewhere deep inside, he knew he needed to deal with it this time. He hadn't gotten better by toughing it out. He hadn't felt normal, and after Googling concussions and CTE, he knew the risks.

He was diagnosed with a concussion and left the field. As it was the last week of the season, the doctors told him to rest. Evan was upfront about his symptoms this time, knowing that the only way he could get help was if he asked. A few weeks into his rest period, he still had headaches, nausea, and fatigue; his new normal. The few rehab exercises seemed pointless and he wanted to get better NOW. He talked to his coach who was as supportive as he could be, but didn't really do anything. Evan asked his club for help or to see someone else, but they didn't have any answers for him. So, Evan called up an old teammate of his who had a bad concussion years ago to ask for advice. Evan wanted to get better and get back on the pitch, and not feeling like himself for so long was wearing on him. His ex-teammate gave him a few names of concussion specialists who had been helpful to him and Evan contacted them right away. Ultimately, Evan worked with many different doctors and medical staff, and each one gave him something to work on. While not everything seemed to help, Evan wanted to get better so badly that he did everything he was told. The process was long, but Evan continued to work; he needed to be back on the pitch, needed to be there for his teammates, needed to play rugby again… but he didn't know when he would be fully recovered, or if he would recover at all.

His teammates were supportive, checking in with him to ask how he was doing and to find out when he was coming back. Evan came clean to his family too, who were happy to provide rides to appointments and a bit of positive social interaction, which meant the world to Evan. While it wasn't the smoothest of roads, Evan's commitment paid off. He was cleared to return to rugby after a year of hard work and is preparing for his second Olympics.

Rachel: The Ice Hockey Player

Rachel had a passion for all sports but took a particular interest in hockey; a sport in which she more than excelled. Her competitive drive and work ethic garnered the attention of

university scouts early. This all came in spite of numerous concussions, most of which had been minor. Her concussion experiences facilitated an understanding of the symptoms and she knew that hiding them wouldn't help her recover. In particular during her final year of high school, she became concussed after being hit head-first into the boards. She stood up, determined to continue playing, and told her teammates and coaches that she was fine. As her symptoms worsened, she realized she needed help and reached out to the school's doctor. From that experience, she learned that hiding symptoms meant feeling alone, performing poorly, and letting people down.

While she had learned what she should do after a concussion, she had also learned that being open about her symptoms could affect her position on the team. In her final year of high school, Rachel had two concussions within a span of three weeks. Her coach said he didn't believe she had another concussion. This meant that she had to get her diagnosis confirmed by another doctor. This distrust really hurt Rachel, but she knew she was doing the right thing; she didn't want to make things worse by coming back too soon if it meant sacrificing her health. Despite her injury history, she had her pick of collegiate programs, and the National Team invited her to training camp. When her dream school offered her a full scholarship, she accepted with glee. It didn't take Rachel long to become a starter; she was a presence on the ice and the coaches were impressed. In her first two years of college, Rachel played a big role in getting her team to the National tournament. However, in her junior year, she collided with an opponent and skated slowly back to the bench. 'You alright Rachel?' her athletic trainer asked. 'I think I might have just got another concussion' she said quietly. Rachel's athletic trainer took her out of the game immediately and the team physician diagnosed her with a concussion.

A week passed and the pain and discomfort were not only in her head but were pulsating down her neck. She felt horrible and had no energy; she had trouble getting her words out and

being positive around others. This was her worst concussion yet. She couldn't go to class, attend team functions, or be around people at all. She applied advice she had received in the past, but nothing seemed to work. Her teammates were supportive, but she barely saw them. Every now and again, one of her teammates would check in and ask how she was doing, but she didn't feel they understood what she was going through. And not having an answer to 'when will you be back?' made her feel more frustrated and alone.

Hockey had been a sanctuary for Rachel; it was a safe space where she could be herself, let off some steam, and have fun. She was a hockey player. Once that aspect of herself slowly started disappearing, her hockey family seemed to disappear. That's when she realized it wasn't just her hockey life that was disappearing, it was her whole life. Her team was no longer there and that meant her support system was gone. She started having panic attacks and crying without knowing why; she didn't feel normal and she felt like she was losing her sense of who she was. Months later, Rachel's symptoms were still controlling her life and the team wasn't following through on promises to get her help. Although she was still technically on the team, she felt abandoned. She and her family fought to get support but ultimately had to get help externally. Rachel wanted someone she could trust; the people that she had put her trust in so far had abandoned her. She went to a number of specialty concussion clinics where she saw various health care professionals. One told her 'I'm not a psychologist, I can't help you,' making her feel like the symptoms were all in her head. Another told her she was just getting old and that the symptoms were a sign of that, not her injury. The next specialist who Rachel saw was shocked that her neck had never been evaluated and recommended physiotherapy. After some of her neck pain had been dealt with, she was referred to a neurologist, which seemed to have the greatest impact. She spent several months recovering and eventually she was cleared to play hockey.

After getting clearance, Rachel and her family talked about what was next. Her symptoms hadn't entirely gone away, but she was told to expect them to last for months or even years. Her family had been a huge help through this time, but Rachel was scared. 'I don't want to risk the possibility of getting another one like that' she said. With the support of her parents, Rachel decided to retire from hockey. She was surprised to realize that she could deal with not playing hockey anymore. Instead, the thing that affected her the most was that she didn't feel human. She was indeed recovering, but this injury had been hell. She felt different from everyone else, unable to describe some of what she was feeling, and people didn't understand what she was going through. She feared additional concussions and she felt alien, even to herself. She had to reshape her whole identity beyond that of an athlete. Social disconnect and these alien-like feelings were her new normal, and she had to find a way to live with that.

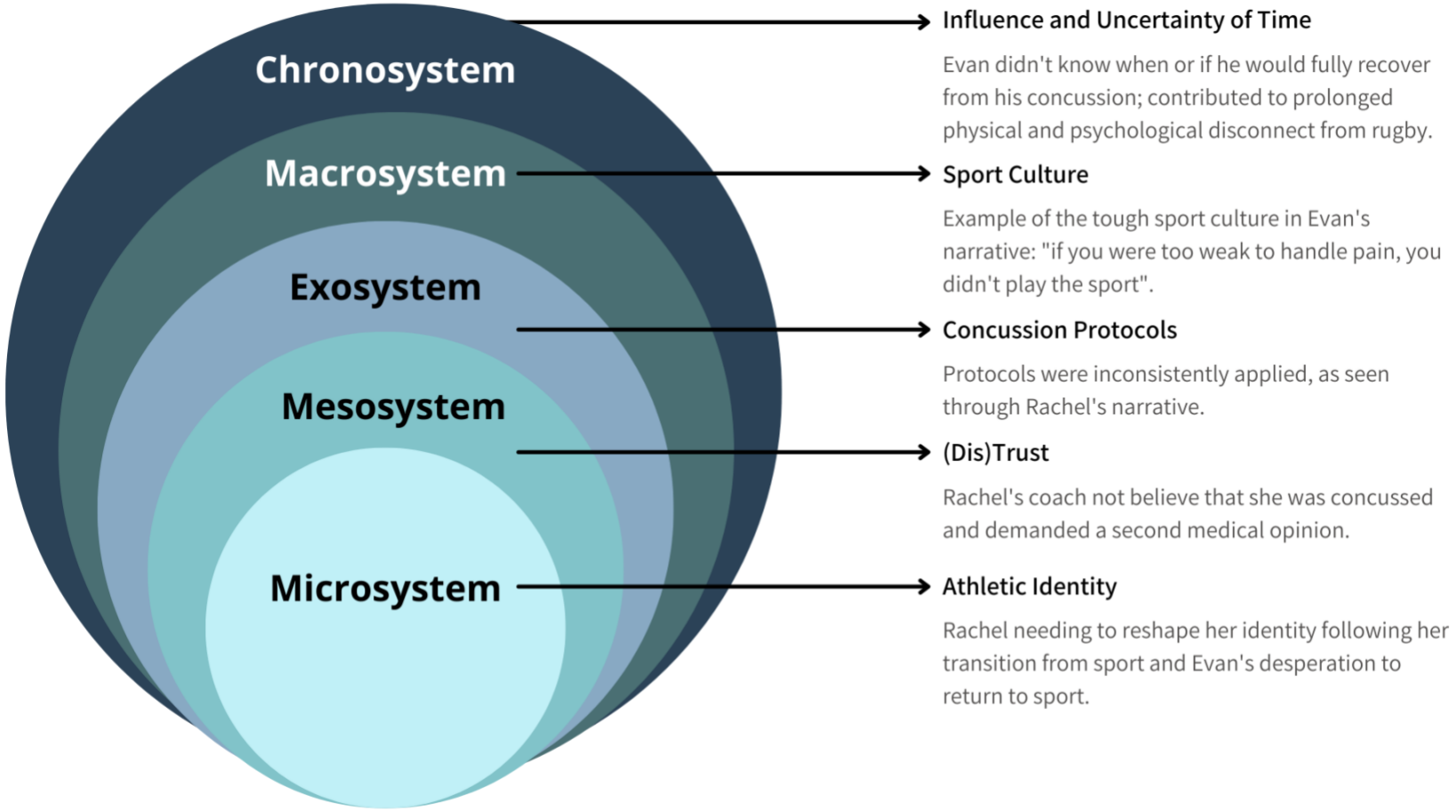
Discussion

The purpose of this research was to deepen understandings of the lived experience of elite athletes with SRCs though an exploration of psychosocial and sociocultural factors, their interrelationships, and their implications on the athlete. Through collaborative inquiry and the above composite narratives, we have attempted to consider these experiences holistically and interconnectedly. While many psychological, social, and cultural factors contribute to the lived SRC experience, we have chosen to focus on one factor per system of Bronfenbrenner's EST. These factors are athletic identity, (dis)trust in relationships, concussion protocols, sport culture, and timing related to major events and recovery. Figure 2 was developed to explicitly highlight examples of how these factors (i.e., themes from analysis) are presented in the composite narratives and where they were situated within the EST based on the researchers' interpretations.

While the following section is separated according to the system of the EST in which a factor was interpreted, these factors should not be understood as independent. Rather, each factor should be viewed as interacting and interrelated, collectively contributing to the complexity of

Figure 2.

Researcher Interpretation of EST Levels and Narrative Themes



Note. A visual representation of how the themes presented in the composite narratives align with systems of Bronfenbrenner's EST. Some brief examples from the narratives are provided to concretely highlight the included themes.

the lived experience. Thus, the following section focuses on the interrelationships between these factors to highlight opportunities for intervention and further research.

Athletic Identity (Microsystem)

As depicted in both narratives, elite athletic identity played a role in many aspects of the athletes' experiences, including athletes' non-disclosure of symptoms and premature return to sport. The importance and strength of this identity is amplified over time through immersion in the context; it represents a key aspect of the athlete's social and internal experience of the world. Gradually developed over an athlete's career and reinforced through the athlete's personal journey (i.e., immersion in sport culture, social identification; Adams & Kavanagh, 2020), an elite athletic identity can be a driving force in decision making and behaviour (Malcolm, 2019b).

While possibly long engrained and solidified, challenges to athletic identity highlight its fragility. For example, retirement from sport can result in a loss of identity, a process which can create adjustment challenges (e.g., psychological consequences; Ronkainen et al., 2016) as depicted in Rachel's narrative. Evan's narrative explored how the injury can threaten an athlete's ability to participate in major events (e.g., Olympics). By mentally minimizing the injury and 'toughing it out', some athletes in our study chose to immediately return to sport without disclosing symptoms, to compete in such major events. This active non-disclosure translated into others' social minimization of our participants' injuries, which may have ultimately prevented them from getting timely, appropriate, and effective treatment. Additionally, injury consequences that may be perceived by the athlete as weaknesses or an inability to perform, can be in direct conflict with the identity the athlete has spent years constructing. Resultantly, the cognitive dissonance between abilities, beliefs, and the realities of the injury can be internally threatening and may impact how an athlete is perceived within their sport and social networks (Dean, 2019).

Ultimately, athletic identity represents one factor that could have psychological, social, and behavioural implications during and after SRCs (Caron et al., 2021). For sport psychology practitioners, understanding how an athlete's identity could influence an athlete's behaviours and internal experience of the SRC represents an important consideration when designing interventions and offering support. Furthermore, education and communication on the importance and influence of athletic identity on behaviour could help those within the athletes' support network be more cognizant of the significance and potential implications of this injury.

(Dis)trust in Relationships (Mesosystem)

Relationships between athletes and their family, teammates, coaches, and SRC management teams have been repeatedly identified as influential on SRC recovery (e.g., Wayment & Huffman, 2019). In our study, trust or distrust within these relationships appeared to play a significant role. As seen within Evan's narrative, athletes sometimes did not disclose to their families, wishing to avoid causing unnecessary worry and assuming that their families would not be able to do anything to help. Foster and colleagues (2019) echo this discussion, suggesting that athletes might hesitate to disclose symptoms if it might negatively impact those they care about. Additionally, disclosing symptoms to teammates, coaches, and others could contradict their *tough* identity by exposing an internally conflicting vulnerability. This was discussed by some of the athletes in this study and illustrated within Evan's narrative when he withheld symptoms from his teammates, coaches, and SRC team at the Olympics. Conversely, when athletes in our study *did* disclose their SRC experiences to their parents and siblings, it was beneficial in facilitating the identification of some symptoms that were previously outside of their awareness (e.g., Evan's narrative; behaviour change). This form of family symptom

identification has been noted in paediatric concussion literature (e.g., Taylor et al., 2010), but was only recently recognized in sport (Davies et al., 2020).

Trust was also considered in coach-athlete relationships. Specifically, some athletes in our study were concerned that disclosing symptoms could result in a loss of position or missed event. As demonstrated in Rachel's narrative, even when athletes did disclose, some coaches did not believe them. In other cases, coaches were described as being "as supportive as they could be". These examples may be reflective of issues in SRC knowledge, as seen in a recent review (Yeo et al., 2020). Within this study, coaches were reported as having moderate knowledge about SRCs in general while displaying gaps in knowledge about SRC management. Thus, while these examples of coach-athlete relationship challenges may be troublesome, they reflect a reality that athletes may face, and a need for further education for those in the athlete's support network.

Athletes also reported that some SRC management team members did not seem to trust the athletes, which led to ill-informed advice, or the minimization of athletes' concerns (Evan's narrative). This distrust could be related to documented cases of malingering (e.g., Silver, 2012). However, questioning and undermining the athlete's experience may cause a host of problems that can immediately worsen the trust between the SRC management team and the athlete, a relationship where trust is critical to rehabilitation adherence (Wiese-Bjornstal et al., 2015). This can leave an athlete feeling vulnerable and isolated, and without sufficient support (Caron et al., 2013; highlighted in Rachel's narrative when visiting a concussion clinic). Furthermore, distrust within these relationships could further solidify athletes' decisions to hide symptoms because they do not believe they will get effective support even when they are open about their experience (Craig et al., 2020).

The athletes in this study identified several perceived and actual barriers that affected their openness in these important relationships, as presented above. Upon reflection, athletes believed that not disclosing their symptoms could (and did in some cases) hinder their receipt of effective support, as demonstrated in Rachel's narrative. While athletes sometimes entirely resisted disclosure (Evan's narrative), they recognized that disclosing was integral to their respective recoveries (Evan and Rachel's narratives). This study, along with other research on psychological, social, and cultural influences on disclosure (e.g., O'Connor et al., 2020) provide important considerations for practitioners, educators, support members, and SRC management teams. Particularly, it is important that athletes not only understand the potential risks of not disclosing, but that those around the athlete build trust to support disclosure.

Concussion Protocols (Exosystem)

At the level of the exosystem, concussion protocols drastically impacted recovery efforts for athletes in our study. From a health care standpoint, athletes incurred inconsistent advice from professionals in the same position (e.g., doctors advising different rest periods; both narratives), echoing Gerbing and Thiel's (2016) statement that athletes encounter information that varies in background, content, and quality. While SRC policy and return-to-play protocols are becoming popularized, they have not yet been consistently implemented within and across all levels of sport (Kroshus, 2019), which may account for some of the inconsistencies reported by our athletes. Additionally, many professionals are claiming to offer concussion care but lack the training and key professional knowledge to offer proper support (see both narratives; Ellis et al., 2017). This becomes further complicated by the idiosyncratic nature of the injury; as symptom presentation, experience, and impairments are heterogeneous, recovery and return-to-sport models are not intended to be one-size-fits-all (Kontos, 2019). Thus, while athletes may view

these differing approaches and advice as inconsistent, these inconsistencies may instead be reflective of the necessary individualized approach, which may require a different strategy than that applied to an earlier SRC. However, as demonstrated within Rachel's narrative, the ineffective application of earlier rehabilitative measures may lead to frustration and could undermine an athlete's belief in their self-efficacy. Understanding this, those providing concussion support should educate the athlete about why specific rehabilitative strategies are being used under different circumstances to avoid confusion around discrepancies and avoid misguided noncompliance or nonadherence.

Sport Culture (Macrosystem)

Another significant factor discussed by the co-researchers was the influential element of sport culture. For example, pushing through pain was demonstrated as a fundamental part of our athletes' identities (Evan's narrative). A macro-level examination of this mentality highlights its possible derivation from existing sport culture; being tough in traditionally masculine and collision sports (e.g., American football, rugby) is well documented. For example, Cusimano and colleagues (2017) suggested that masculine cultures within minor ice hockey, paired with coaches' promotions of playing tough, discouraged players from reporting concussive symptoms. While this tough culture promotes strength in the face of pain (Liston et al. 2018), athletes are exposed to further risk (McCrory et al., 2017). Research has also presented acknowledgments made by athletes and coaches in these traditionally tough sports, explaining that sports come with inherent risks and that SRCs are an expected reality and consequence of the required bodily sacrifice (Zanin et al., 2020). Thus, our athletes' discussions on this tough-sport mindset may be the result of normalized and fortified cultural expectations (Evan's narrative; Liston et al., 2018). To minimize the implications of this mentality, concussion educators must find ways to

demonstrate that playing through concussive injuries should not be associated with the culture of martyrdom and altruism often idealized in response to playing through injuries (Malcolm, 2019b).

Evan's narrative also demonstrates how decisions to return prematurely were reinforced by a desire to 'be there' for his teammates. Many of the athletes suggested that missing out on team activities, feeling isolated, and the lack of teammates' understanding of their experience were serious concerns (see Rachel's narrative). According to Ventresca (2020), the significance of this disconnect from teammates may be the result of cultural norms that prioritize team success over individual wellbeing. Thus, sport culture may define athletes' experiences and reinforce the team-first mentality, which ultimately prioritizes performance over wellbeing and the needs of the team over individuals' needs. For this reason, deliberate effort to normalize recovery processes and facilitate supportive team culture around injury appears necessary.

Timing Related to Major Events and Recovery (Chronosystem)

Another key theme was the influence and uncertainty of timing. Specifically, time until a major event (e.g., Olympic Games, last year of collegiate eligibility) and unknown recovery timelines were major concerns for all of our athletes. Timing represented a pressure to return to sport (Evan's narrative) and a source of psychological distress in the recovery process (Rachel's narrative), both common experiences for athletes with SRCs (Tjong et al., 2017). As such, previous suggestions to consider seasonal stressors (e.g., within the regular season versus playoffs; Roiger et al., 2015), corresponding psychosocial demands for athletes to return (Dean 2019; Wayment & Huffman, 2019), and the absence of concrete timelines and goal-directed tasks (e.g., reach a specific range of motion; McCrory et al., 2017) should be taken seriously.

Despite its relevance and seemingly central role in experience (see time influences in both narratives), timelines and resulting impacts are significantly underexplored in SRC research.

Practical Implications and Future Research Directions

Taken together, the results of this research highlight an important opportunity for research and practice: the opportunity to move towards a more holistic rehabilitation approach. As mentioned, current concussion protocols are based on the expertise of medical and health care practitioners and researchers, but these protocols lack consideration for psychological aspects of the injury (Bloom et al., 2020). Research should continue to leverage diverse methodologies like collaborative inquiry to enhance our understanding of these psychological aspects. For example, this study offers insight into how micro to macro-level barriers can impact support, influence rehabilitation adherence, and affect recovery. Future research on psychological aspects of SRCs could employ similar multi-level examinations to increase understanding of the interrelated nature of experiences and ultimately help broaden our understanding of where psychological support efforts can and should be undertaken.

Additionally, building from the approach taken within this study, participatory-type research approaches and holistic SRC management strategies should seek to explicitly explore emotional factors of the SRC experience. As Bloom and colleagues (2020) concur, consideration for emotional aspects in SRC management is significantly lacking. Narratives and other creative forms of data presentation will be useful in demonstrating emotionality, potential targets for intervention, and build from recent research which has started to explore the importance of emotional support (e.g., André-Morin et al., 2017; Davies et al., 2020). Together, continued efforts to build our understanding of athletes' emotional, psychological, social, and cultural experiences of SRCs will help support the creation and provision of increasingly holistic support.

Finally, from a practical standpoint, including sport psychology practitioners (e.g., mental performance consultants, sport psychologists) in concussion management and rehabilitation discussions can help address psychological needs. Specifically, sport psychology practitioners are very well positioned to support athletes' psychosocial needs, particularly when embedded within the sport and/or integrated support teams. Given their professional knowledge of psychological and social variables and skills, these practitioners can help identify targets for individualized psychological support during rehabilitation and facilitate teammate interactions (as tolerated) during early phases of rehabilitation where such interactions are often limited. They can also provide education to coaches and management about the influence of team and/or sport culture on premature return-to-sport. Perhaps most importantly, these practitioners are well-positioned to advocate for the athlete. Heil (2016) explains that advocacy within the social institution of sport is an ethical responsibility of the sport psychology practitioner as part of their role in facilitating athlete wellbeing. Such advocacy at a team level can be of particular importance in combatting cultural schemas around tough sport culture and in challenging the social acceptability of behaviours that promote team success over individual wellbeing (Kerr & Stirling, 2019). Importantly, this should include advocating for athletes' psychological readiness in returning to sport. In addressing these areas, practitioners who undertake this important responsibility may encounter challenges. For one, there is limited education and training available on effective advocacy strategies and on how athletes can be safeguarded (i.e., preventative measures). In addition, power dynamics within sport may influence the success of such advocacy. For example, athletes may be hesitant to share that they do not feel psychologically ready to return for fear of repercussions, resulting in a failure to disclose, which could impact a practitioner's ability to advocate (Kerr & Stirling, 2019). Ultimately, there is

more than meets the eye with SRCs, and researchers and practitioners have a responsibility to do a better job of ensuring that athletes have the holistic care and support they need.

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Article 2: Psychological and Social Needs: Athletes' and Mental Performance Consultants' Perspectives on a Gap in Concussion Protocols

Seguin, C. M., & Culver, D. M. (2022). Psychological and social needs: Athletes' and mental performance consultants' perspectives on a gap in concussion protocols. *Journal of Clinical Sport Psychology*, Advance online publication, 1-20. https://doi.org/10.1123/jcsp.2021-0098

Abstract

While research advancements have substantially improved concussion management efforts, consideration for the psychological and social aspects of concussive injuries have remained largely absent from concussion protocols. The present study was undertaken to identify elite athletes' psychological and social needs during the recovery process. Elite athletes with a history of concussion and mental performance consultants who work with concussed elite athletes participated in focus group interviews to shed light on these needs. A thematic analysis of these focus groups revealed six psychological and social needs: acceptance, normality, confidence, self-efficacy, trust in relationships, and social support. These themes are framed within concussion literature to help initiate a conversation on how psychological and social needs should be addressed as part of multifaceted efforts to improve concussion recovery.

Keywords: *sport-related concussion, rehabilitation, sport psychology, psychosocial support*

Sport-related concussion (SRC) symptom experiences and recovery trajectories are idiosyncratic (Kenzie et al., 2018), but SRC protocols focus mainly on physical symptom management and recovery (e.g., progressions in activity levels). Indeed, Bloom and colleagues (2020) stated that current concussion protocols largely disregard psychological factors that can impact experience and recovery, advocating for researchers to delve into the nature and context of SRCs to understand psychological factors to inform care strategies.

Qualitative researchers have started answering this call through lived experience research, exposing, for example, the existence of depression (Caron et al., 2017) and threats to athletic identity (Dean, 2019) in connection to SRCs. Recently, Seguin and Culver (2021) also highlighted the role of social factors during recovery, stating that the nature of athletes' social relationships can impact the athletes' internal reality of their SRC experience, and affect behaviours that influence recovery (e.g., injury reporting). Notwithstanding, and despite advocacy for psychosocial support for other sport-related injuries (e.g., Ivarsson et al., 2017), most SRC protocols have not yet effectively considered these factors in recovery. To date, SRC protocols are based on the consensus statements created by the Concussion in Sport Group, which are intended to synthesize published research with the purpose of guiding concussion management. These include a graduated return-to-sport strategy encompassing six steps after rest (i.e., symptom-limited activity, light aerobic exercise, sport-specific exercise, non-contact training drills, full contact practice, and return to sport), as well as medical and clinical health considerations throughout concussion management. Despite their acknowledging "there is a growing body of literature indicating that psychological factors play a significant role in symptom recovery and contribute to risk of persistent symptoms [(e.g., cognitive impairments, depression)] in some cases" (McCrory et al., 2017, p. 6), there is no mention within this

statement of what these factors are, nor how they can be addressed. This absence of clear factors provides the impetus for this research. Explicitly identifying the psychological and social needs of athletes during recovery could help appropriately broaden the scope of SRC return-to-sport protocols. In addition, such efforts could be used to inform the creation and implementation of suitable support strategies to help athletes be psychologically ready to return to sport. Thus, the purpose of this article is to identify psychological and social needs of elite athletes with SRCs. Expanding on existing research, we considered psychological and social needs from two expert populations: (1) athletes who have first-hand SRC experience, and (2) mental performance consultants (MPCs) whose professional expertise puts them in an optimal position to identify and provide athletes support for these needs.

Athletes & MPCs

One important population in the identification of psychological and social needs during concussion recovery are the elite athletes themselves. As noted, lived experience research in elite sport has started to shed light on the experience of having a SRC through the athletes' eyes (e.g., Caron et al., 2017; Seguin & Culver, 2021). These perspectives offer direct insight into the multifaceted aspects of the SRC experience and help ensure that psychosocial support strategies are appropriately developed to target their needs.

Another population who can identify psychological and social needs during SRC recovery are MPCs. MPCs typically work in sport and are educated in the fields of sport psychology, counselling, and consulting, and offer support and training on the use of social, psychological, and emotional skills (Quartiroli et al., 2019). The role of the MPC should extend to the injured athlete, by helping the athlete "adjust to their temporary reduction in physical activity. Using skills such as goal setting and imagery can help exercisers and athletes manage

pain, adhere to rehabilitation protocols, and increase confidence upon return to full participation." (AASP, n.d. b). Previously, researchers have claimed that sport psychology practitioners (c.f., MPCs, sport psychologists[2]) "should be an integral member of any sports concussion management team" (Kontos et al., 2004, p. 231) and that their expertise on sport psychology techniques may assist in addressing psychological, social, and emotional aspects of injuries, including emotional reactions (e.g., fear, feeling helpless; AASP, n.d. a), social pressures (e.g., pressure to return prematurely; Kroshus et al., 2015), amotivation, and challenges to athletic identity (Caron et al., 2013). Given their expertise and immersion in the elite sport community, MPCs are in an optimal position to recognize and identify psychosocial stressors, and support athletes' psychological and social needs (Seguin et al., 2022). Their views on athletes' needs during SRC recovery are both warranted and an ideal lens through which to examine the psychosocial experience (Bloom et al., 2020).

While the perspectives of athletes and MPCs offer valuable insight on their own, considering their perspectives in combination offers a distinct advantage of garnering insight on the main gaps (organized by theme) that athletes are facing, and allowing an opinion from the MPC on that gap. Together, the convergence of perspectives (i.e., athletes' lived experience and MPCs' expert opinion) around these themes should help clarify psychological and social needs for both clinical and non-clinical readership and ultimately help inform advancements in SRC protocols which currently lack consideration for these needs.

[2] While we refer specifically to MPCs, this is not intended to exclude other sport psychology professionals. Instead, we have selected MPCs as it is acknowledged by AASP and other sport psychology associations, that MPCs are often embedded within sport teams, particularly in elite sport where the current study is situated.

Methodology and Methods

This research is framed within a constructivist lens, where knowledge is formulated through individual and collective constructions of experience, sometimes coalescing around a form of consensus (Lincoln et al., 2017). This framing supported the above-noted research purpose and the overall aim of understanding psychological and social needs by interpreting participants' perceptions of the SRC experience. In turn, a basic interpretive methodology was deemed appropriate as it involves an exploration of (1) how experiences are interpreted by people, (2) how people construct their worlds, and (3) what meaning is attributed to these experiences (Merriam & Tisdell, 2016). Ultimately this methodological approach enabled an understanding of psychological and social needs from athletes' and MPCs' first-hand experience.

Participants

Athletes and MPCs were recruited for this research using purposeful, criterion, and snowball sampling (Patton, 2015). The researchers recruited athletes meeting the following criteria: the athlete (1) was either presently competing or had competed recently (i.e., within the past five years) as an elite athlete (see Swann et al., 2015 for information on elite athlete classification), and (2) had been diagnosed with at least one SRC while competing as an elite athlete. This latter criterion was left intentionally broad (i.e., not limited to athletes who had protracted symptoms) to include a range of experiences; as SRCs may be variable in duration and severity, understanding psychological and social needs across these experiences was deemed important. MPCs were recruited (1) from the Canadian Sport Psychology Association and AASP as these organizations utilize the term MPC to identify members working professionally in the field of sport psychology, (2) if they were working in the elite sport domain (i.e., national, international, professional, varsity athletes; Swann et al., 2015), and (3) if they had worked with

at least one elite athlete who experienced a SRC. The third criterion was more difficult to establish due to confidentiality in the consulting relationship. Thus, MPCs were targeted if they worked in high-impact sports and/or sports with high SRC incidence rates (e.g., ice hockey, rugby, American football). Ultimately, 15 current and former elite athletes and 20 MPCs were recruited. Ten athletes ultimately participated[3]. Nine MPCs participated[4], representing a range of individual and team sport contexts, and years of experience. Tables 1 and 2 present some key information about the participants.

Data Collection

Upon receiving ethical approval from the University of Ottawa's Research and Ethics Board, athletes and MPCs were sent recruitment texts. Those interested received a consent form to review and could ask questions before providing informed consent. Athletes and MPCs participated in one of eight semi-structured focus groups (five for athletes; three for MPCs; *M* = 65 minutes, Range = 46-98); these were transcribed verbatim (151 single-spaced pages). Small focus groups were formed to stimulate interaction between participants, to have at least three focus groups of athletes and MPCs for saturation (Smith & Sparkes, 2016), and to avoid scheduling conflicts (i.e., international participants). Within the focus groups, athletes were asked about their sport experience; the number, duration, and symptoms of their SRC(s); significant factors throughout their injury; and challenges (e.g., What kind of support did you have throughout your experience? What was the hardest thing about your concussion?). MPCs were asked about their consulting experience (e.g., time in field), the work they do with athletes

[3] Two athletes did not respond, and three consented but did not arrive at their scheduled times and were unable to reschedule.

[4] Six MPCs did not respond, three declined participation, and two expressed interest but could not participate.

with SRCs (e.g., phase of injury, interventions), as well as their perceptions of their role in SRC management.

For both athletes and MPCs, follow-up questions were sent via email, particularly when questions arose in another focus group that were of interest, or if clarification about a response was needed. The participants received the transcripts for member reflection (Smith & McGannon, 2018), confirming the accuracy of the transcription, and to ask if the transcript was reflective of their experience (i.e., communicated in a way that aligned with their perception of their experience, and to facilitate engagement in further reflection; e.g., asking an MPC: "Has your personal experience with concussions influenced the approach you take with concussed athletes now?", and "Did you take anything away from the focus group experience?").

Data Analysis

The data were analyzed using Braun and colleagues' (2016) six-phase thematic analysis (TA). Given the basic interpretive study design, TA is an excellent strategy for identifying recurring themes and patterns (Merriam & Tisdell, 2016), related to a specific issue (Braun et al., 2016). Thus, an inductive TA approach was carried out in an iterative fashion (see Table 3 for a description of each phase and examples from this process).

Trustworthiness

A relativist approach to trustworthiness was adopted for its philosophical alignment with constructivism and to ensure an overall coherent research approach. The relativist approach allows researchers to tailor evaluative criteria to the goals of the inquiry (Burke, 2016; Smith & McGannon, 2018). To maintain trustworthiness, the strategies below were employed for coherence, credibility, transparency, and substantive contribution.

The incorporation of athletes' and MPCs' perspectives enabled us to understand the

Table 1.

Participating Athletes

Athlete Pseudonym	Gender	Highest Level of Sport	Competing or Retired?	Diagnosed Concussions	Suspected/ Undiagnosed Concussions	Shortest Concussion Duration	Longest Concussion Duration
Aiden	Male	International	Retired	5	15	1 week	1 month
Brandon	Male	Professional	Competing	4	5	1 week	2 months
Derek	Male	International	Retired	2	10	4 days	3 weeks
Evan	Male	Collegiate	Competing	2	5	2 days	3 weeks
James	Male	Professional	Retired	5	0	1 week	8 months
Karen	Female	Collegiate	Retired	2	3	3 days	2 weeks
Lennox	Male	Collegiate	Retired	1	3	2 weeks	4 months
Rose	Female	International	Retired	4	4	4 days	2+ years
Tanya	Female	Collegiate	Retired	2	5	2 weeks	3 months
Zach	Male	Professional	Competing	1	1	1 week	1 week

Note. Specificities about the individual athletes' sport, performance success (indicating which level of "elite" they would be classified as according to Swann et al., 2015), and duration of time in sport have been omitted to protect confidentiality. However, all athletes who participated in this study competed in high-impact or contact sports, competed in elite sport for 4 to 15 years, and have earned world-class elite (n = 1), successful-elite (n = 4), competitive-elite (n = 3), or semi-elite status (n = 2; Swann et al., 2015).

Table 2.

Participating MPCs

MPC Pseudonym	Gender	Years as MPC	No. of Concussed Athletes	Personal Concussion Experience[a]
Andrea	Female	16	10	No
Beth	Female	19	20	Yes
Frank	Male	4	20	Yes
Georgia	Female	18	12	No
Heather	Female	10	10	No
Isabelle	Female	30	50+	No
Joey	Male	14	12	No
Mike	Male	25	50+	Yes
Rachel	Female	10	8	Yes

Note. Specific details about the MPCs' sporting context(s) have been omitted to protect the confidentiality of the MPCs and their associated sport teams/organizations. However, all MPCs who contributed to this study have worked with or are currently working with elite high-impact or contact sports. The number of concussed athletes that MPCs have worked with is based on their personal estimations. Those who worked with more than 50 athletes are indicated as "50+" as the exact number was unclear, but was suggested as possibly being as high as 100.

[a]"Yes" indicates that the MPC has personally sustained a concussion in their own athletic career.

experience within a social context; and further gain coherence and credibility through transcript review, member reflections, and reflexivity by the first author. This also involved seeking deliberate alignment between the paradigm, methodology, data collection and analysis methods, and the produced manuscript. Critical friends (i.e., researchers outside the project) were integral to fostering credibility and transparency within the research, and helped scrutinize the research approach and open a dialogue for interpretation and explanation of results in the manuscript. We also grounded these perspectives within empirically supported research through our research design and within this manuscript to promote substantive contribution and situate our results to create a meaningful picture of psychological and social needs.

Table 3.

Six-Phase Thematic Analysis

Phase	Description	Examples
Phase 1: Familiarization	Familiarized herself with the data by listening to the audio from the focus groups and re-reading the transcripts	Examples of codes: - Shift in perspective - Self-regulation for respecting symptom thresholds
Phase 2: Initial Coding	Created initial codes to represent meaning units	
Phase 3: Thematic Development	Developed initial themes based on review of initial codes and meaning units	Examples of initial themes: - Adaptation - Conflicts with identity
Phase 4: Theme Refinement	Refined themes through critical discussions with the second author, a mapping exercise, and theme comparisons	
Phase 5: Naming	Assigned names and definitions to each theme	Final theme: - Acceptance
Phase 6: Write Up	Wrote the present document	

Note. While this analysis is presented in a linear fashion, phases were revisited throughout to ensure consistency, as well as reflection on results to adapt to evolving interpretations as the first author became further immersed in the analysis process (Braun et al., 2016).

Results

The TA process resulted in the creation of six themes, representing the psychological and social needs identified by both the athletes and the MPCs. These themes are: acceptance, normality, confidence, self-efficacy, trust in relationships, and social support.

Acceptance

> *I came to the realization that this is my one body, and this is my one time, and I can try to push it and then just fall back to square one… it took me probably 10 times to hunker down and realize that I needed to get better… I was just like "OK, let's get real, let's get better". (Rose, athlete)*

Acceptance was discussed by athletes and MPCs as one of the most important elements in SRC recovery. This meant being accepting of the circumstances, accepting of the uncertainty that plagues athletes with these injuries, and accepting of symptom limitations:

> The difference is the self-acceptance of the athlete to live with their symptoms, and to be OK with not pushing, because that is what athletes don't know how to do. You know how to try harder in every situation, but you don't know how to stop. (Isabelle, MPC)

This psychological challenge of pulling back on the reigns, as Joey (MPC) explained, "is a huge challenge […], and when you're dealing with concussion, you've got to put the well-being card up while recognizing they're still being guided by those performance objectives." Georgia (MPC) suggested that this acceptance requires a critical cognitive-behavioural shift: "We're trying to get them to shift their habits from performance to wellness". While several athletes, like Rose, said they were initially resistant to accepting their limitations and prioritizing wellness, athletes came to appreciate why accepting a wellness mindset was important:

> In the long run, it's your career… there's no point in rushing back because if you end up getting another one right away, you're useless to the team even longer. It's better to take care of yourself as soon as you can and go through all of the steps that are required of you. (Brandon, athlete)

Accepting limitations was not just important for returning to sport, but for life afterwards:

> My dad's a doctor so I've had a few conversations with him about it. You've got a life to live, you know. So basically, he was trying to tell me, like: "Is it worth this to go back and potentially... if you get another bad concussion, it might be double the amount of time as it was this time to get better?" (Aiden, athlete)

A key component of being able to shift this mindset and think long-term is being realistic. As Beth (MPC) highlights, the consequence of being unrealistic can be damaging to recovery and mental health: "Preparing them to be realistic when they come back, to be self-acceptant […] of where they might be in their progression… if they thought they'd be there, and they're here… that sucks". For Rose (athlete), the importance of doing what she needed to do to recover and being realistic about her timeline was not realized until over a year into her worst SRC: "I came to the realization that sport was what was most important to me. And I would do anything to get back". For her, that meant accepting the help she could get from friends, family, and a slew of different concussion specialists; and doing what she was told, even if that kept her away from sport. She claimed that the realization that putting her health first, after suffering a SRC at her third Olympics, is what "drove me to go to my fourth Olympics" (Rose, athlete).

Normality

> *"Just to feel some form of 'normal' going through those experiences… that would [have been] huge." (Lennox, athlete)*

The psychosocial challenge of lost normality was described as hugely influential on athletes' psyche. Their daily routine; connectedness with teammates, coaches, friends, and family; and presence in their physical training environments were often absent following the acute phases of injury: "everything was being taken away that was normal life" (Rose, athlete). The tasks and strategies athletes would typically use to deal with stress were impossible to execute. Heather (MPC) notes, physical training is often a source of stress relief, but SRC symptoms can affect the use of such strategies: "you're so used to being active, and now you can't be active because if you're active, it gives you a headache. It's a vicious, vicious cycle.".

The need for social integration, psychological skills, and strategies for coping with this process was reported as ever present. From an MPC's standpoint, trying to re-establish some sense of normality throughout the injury is important:

> I would help kind of guide them to assisting practices without practicing, just so that they're OK with it, but that they still feel part of the team and that they still feel that support of the team. I think it's important. (Heather, MPC)

In some situations, inclusion or re-integration was reported as being more natural, particularly in sports where these types of injuries were common:

> Within the space of five minutes of the start of the week, 20 of the players will have asked them about: 'How's your head?' 'How are you doing?' and then there'll be some shared experiences and empathizing going on as well. (Mike, MPC)

Notwithstanding, athletes who competed in those same sports expressed a deep-felt sense of loss of normality: "I think if there is something called normality, or whatever you perceive to be normal, you're definitely not within that realm. You're a bit outside of it. You're really not yourself; you're not quite fully there" (Derek, athlete). Evan (athlete) similarly explained: "the

best way I can describe it would be that I just didn't feel like myself." Thus, strategies to re-establish some sense of normality were often prioritized by MPCs. As Mike (MPC) said: "they're used to having structure. So, the more there is structure, the more I think mental skills are integrated into existing routines and existing cultures or norms, that's useful."

Confidence

"And then when I did return to play, I was scared to play" (Tanya, athlete).

A lack of confidence and fear about returning to play were reported by several athletes in our focus groups, which was subsequently echoed by the MPCs. "So, they're competing once again, but they're still dealing with the lingering effects of having had an injury that, whether it was traumatic or it just had a long recovery time, was difficult for them to deal with" (Frank, MPC). Fear in this sense, involved return-to-sport anxiety, fear of re-injury, and fear of long-term consequences. Some of the underlying sources of this fear were exposed by some athletes:

> As you move on to Phase Two [of the return to play protocol], you may pass again, but you're still experiencing some symptoms. I feel like there's a lot of pressure to move on to Phase Three, even though you may not really be mentally ready. (Karen, athlete)
>
> I've done a bit of reading and whatnot afterwards on concussions and CTE [chronic traumatic encephalopathy], and some of the longer-term stuff that comes with that; that gives me a bit of anxiety now… I'm concerned about in 10-years' time when I stop playing and I think I'm fine, and then suddenly the brain starts to go on me, or other symptoms start to pop up […] You read into it and you feel like it's just kind of a waiting game of 'is this going to happen to me?' (Brandon, athlete)

In facing athletes' anxiety about not feeling mentally ready to proceed, or fear of long-term consequences, MPCs discussed the importance of taking action to restore confidence in the

process. This included using education to help challenge narratives that are created out of misinformation (e.g., myth: everyone who gets a concussion will develop CTE).

Whether evidence-informed or misinformed, the lack of confidence in healing and ones' abilities appeared central to many athletes' concerns. In connection to this, MPCs discussed the importance of psychological skills to increase athletes' confidence in their recovery and return-to-sport. For example, Isabelle (MPC) noted that "sometimes those builder [mental] skills are really important for building your confidence… as opposed to pushing them too hard and fast." Some athletes echoed this emphasis on building confidence prior to their return. For example:

> I learned about visualization… and I would use it when I was concussed because I wasn't able to actually [do the sport]… stay relevant… because I was able to visualize myself doing it and when I got back, it all came back quite quickly. (Rose, athlete)

Self-Efficacy

"I wasn't in control" (Tanya, athlete)

Other psychological challenges for athletes were the "uncontrollable timelines… and feeling like you're progressing and then take a step back" (Beth, MPC). Self-efficacy regarding performance and recovery was questioned: "like 'why the hell am I not getting better when I'm doing all of these things that the doctor told me to do?'" (Lennox, athlete). Andrea (MPC) suggested a challenge is "to get the athletes back to where they want to be. Whether that is because the injury is so severe, because that fear component is there, they just can't get back to that level and that frustration is significant."

Self-efficacy was also a challenge from a psychosocial standpoint, in that an athlete's inability to recover might impact how others view the athlete: "it may sound a little silly, but I'd say what was threatened was maybe my legacy" (Karen, athlete). Suffering a SRC in her senior

year, Karen felt like her opportunity to leave a mark on the team was taken away. Zach (athlete) explained, the inability to return to competition "was the hardest thing for me… Obviously it hurts and you know it hurts, but it's just one of those things". James (athlete) similarly explained:

> Not being able to play… being sent home and then being told that you're going to be traded… It felt like I was playing on a team, but I wasn't really on a team; I felt like they were against me… it didn't feel good. It hurt.

Thus, while self-efficacy affected athletes' perceptions of recovery, the felt loss of opportunities to compete and contribute as a result of their inability to perform were equally substantial.

Trust in Relationships

> *"Those looks and comments from people who might not believe that you're actually injured drag on you." (Lennox, athlete)*

Trust was a very impactful factor in the athletes' experiences, particularly within their relationships with their coaches, teammates, and SRC management team. For some, SRCs resulted in distrust in the coach-athlete relationship. James (athlete) indicated: "I had to seek the advice of three different doctors to basically write notes to my coaches because they didn't believe me, that I had a concussion, despite having to be carried off on a stretcher." While not always so extreme, athletes reported feeling this distrust from teammates and coaches, even when it was not verbalized. For Zach (athlete), this meant that leaving the game required a serious, diagnosable injury, as anything less than that would be perceived within the team as weakness or a lack of commitment:

> Even though some people don't say anything, they kind of look at you oddly, because if it ends up not being a concussion, then you're looked at very differently within the team than if you came back and finished the game.

As Lennox (athlete) explained, "it's those looks, comments, and feelings together" that pose a challenge. Particularly as an "invisible injury", people might not believe the athlete is injured.

To help athletes navigate these relationships and reinforce trust between the athlete and others, MPCs emphasized communication as an empowerment strategy to aid comprehension: "I do a lot of work helping them navigate how to talk to other people, whether it's the coach, friends, family… Because [that's] one of the biggest problems" (Beth, MPC). As Karen (athlete) illustrates, well-intentioned questions from teammates can encourage a premature return:

> I think my teammates prioritized "How are you feeling?" And then yes, they would slip in: "When do you think you will be coming back?" "Do you think you'll be ready for this game?" "Or the game in two weeks?" And so, although it was clouded in care, I felt like there was still underlying pressure to return.

As such, MPCs appeared to have an important role in helping athletes learn to navigate these interactions, and in helping the support team learn how to communicate in more positive ways.

The issue of trust also extends to practitioners (e.g., medical, psychological) who are providing support. For athletes, distrust was often the result of poor interactions, misguided advice, and a lack of understanding between the athlete and the practitioner. For example, some athletes indicated a desire to be heard and respected, where they previously were not. Distrust toward those within the athlete's integrated support team (IST) stemmed from professionals offering little to no advice, or ill-informed advice. For example, Rose (athlete) shared an instance where her counselor suggested age was causing her diminished daily functioning, not her SRC:

> I was like, I am feeling really slow and he [the counselor] was like, "Well, you are getting old." And I was like, "oh my gosh, you're kidding me! My whole nervous system is down and you're telling me I'm old!" (Rose, athlete)

This lack of belief or trust in the validity of the athletes' statements was a huge concern for athletes, which lead to the receipt of ill-informed advice, or to the athlete quitting all together. As Derek (athlete) indicated, all he wanted for himself and for athletes with SRCs in the future was trust and respect in these relationships: "Treat the person like a person! Pass them to someone who you know is going to be a trusted and reliable source" (Derek, athlete).

Social Support

> *"[Having] others around you… who know how to help… that's huge, because a lot of people don't know how to help you." (Derek, athlete)*

Along with the need for trust, positive and socially supportive relationships outside of the medical team, coaching staff, and teammates were also described as important and desirable. When asked about how she would help someone with a SRC, Tanya (athlete) said: "I would just try and be encouraging and validate their experience". This had been lacking for her when it came to psychological symptoms. She explained that her knowledge of SRCs at the time of her injury was more regarding what physical symptoms could arise, and not the psychological ones:

> I probably didn't recognize them [psychological symptoms] right away as symptoms of a concussion, which I did years later, and I think I thought there was shame associated with it…. I felt more like I needed to hide the psychological stuff versus the physical stuff, but my physical symptoms went away long before the psychological ones. (Tanya, athlete)

For Tanya, she explained that someone validating her experience of psychological symptoms would have helped her deal with some of the stigma around the disclosure of symptoms.

Another challenge experienced was that those in the best positions to offer validation and positive social support did not always have the understanding of how they could be supportive. Athletes identified this as a source of frustration, as seen in Derek's quote earlier in this section. As Lennox (athlete) indicates, this frustration highlights an important area for desired psychosocial support: "you want to feel connected to others… that you're not alone, that the people who are helping you also have knowledge of concussions and some understanding of the experience." According to Rachel (MPC), part of this challenge is the invisibility of SRCs:

> If you have a broken arm or a broken leg, people know how to help you because they can make your dinner or do everything around the house you need to do. But with concussions, people don't always know what they need to do to help. Or even realize that it is a fairly serious injury… There's nothing visibly wrong with you. You can see if your leg's in a cast, but you can't see if there's a brain injury.

As Rachel (MPC) further noted, it might also be about ensuring that the athlete has the right kind of support. Isabelle (MPC) suggested that this might best come from other athletes:

> And sometimes, you know, getting the athletes to speak to another athlete that's been through the exact same process is how they've come back. You know, that injured athlete support from someone else is beneficial. I find that really beneficial.

Discussion

This is the first study to combine personal experience (athletes' perspectives) with professional expertise (MPCs' perspectives) to garner insight on psychological and social needs during SRC recovery. To build on recent calls for action regarding SRC protocols and policies (Bloom et al., 2020; Seguin & Culver, 2021), this research aimed to respond to a gap in concussion protocols by identifying psychological and social needs during concussion recovery.

It is important to recognize that these needs, although categorized as either psychological or social, are connected, meaning these needs are the result of psychosocial factors which may affect one or multiple dimensions of experience.

Psychological Needs

Recovery for athletes in this study was intertwined with acceptance, and MPCs stated that facilitating athletes' acceptance was a critical part of their role. In essence, if the athlete accepted that progress would vary and accepted the limitations imposed by symptom thresholds (McCrory et al., 2017), their symptoms improved. If they did not accept their limitations and continued to push through, they often experienced setbacks (e.g., symptom aggravation, negative emotional consequences). While this concept of accepting limitations may appear simple, it directly counters the elite sport mentalities these athletes have spent their lives constructing (Adams & Kavanagh, 2020). For example, elite athletes train diligently to surpass performance goals and a critical piece of performance enhancement involves pushing beyond pain thresholds and demonstrating toughness in the face of adversity (Astokorki & Mauger, 2016; Liston et al., 2018). Further, toughness in response to injuries is reflective of social and cultural expectations of bodily sacrifice (Zanin et al., 2020) wherein pain is normalized and viewed as another barrier to push through rather than submit to. As such, strength in the face of adversity is an integral part of elite athletes' identities. Thus, the significance of the challenge of acceptance, particularly in relation to limitations and pain tolerance, cannot be understated.

Moreover, acceptance may be more challenging due to the loss of normality, also discussed by our participants. Currently, many concussion protocols recommend a period of 24-48 hours of rest, followed by a gradual reintroduction to environments and activities as tolerated (McCrory et al., 2017). This reintroduction largely focuses on physical and cognitive activities

and often lacks the structure that elite athletes are used to with other injury protocols (e.g., reach a specific range of motion). Further, training environments are often full of bright lights (e.g., stadium lights) and loud sounds (e.g., dropped equipment, cheering), for which concussed athletes may have less tolerance (Theodoroff et al., 2022). Beyond environmental stimuli, demands for social interaction (particularly in team settings) are generally high, which may also increase athletes' symptoms (Caron et al., 2021). As such, being in the sport environment, which may help re-establish a sense of normality, could aggravate symptoms. Thus, while many physical rehabilitation strategies are in place, strategies for the psychosocial implications that result from being removed from these environments (e.g., peer support groups) are not. As described by several athletes, this absence of normality can also create a disconnect between the injured athlete and their social environment, which may play a larger role on the mind than the physiological impact of the injury itself (Turner et al., 2017). Furthermore, the strategies athletes often use to procure some sense of normality (e.g., exercise, socialize at sport facility; Covassin et al., 2017) are difficult to effect while accepting injury limitations. As such, strategies which aim to restore a sense of normality (e.g., performance and recovery oriented goal-setting) and facilitate acceptance (e.g., cognitive reframing) appear to be critical, yet presently absent in SRC protocols.

Confidence and self-efficacy were also apparent psychological needs, particularly during the later phases of recovery and early phases of return-to-sport. Athletes and MPCs highlighted that fear, uncontrollability, and frustration undermined confidence and self-efficacy surrounding abilities to recover and effectively return to sport. Based on these fears, uncontrollability, and frustration, a lack of education may have played a substantial role for our participating athletes. As earlier mentioned, SRC recovery trajectories are idiosyncratic. In other words, what might

work for one SRC might not work for the next, one SRC might last significantly longer than another, and symptom experiences across SRCs might differ even within the same athlete (Kenzie et al., 2018). In essence, the consistent structured approach that is often used for performance and other injuries is ineffective. As a unique experience is perhaps the only certainty with SRCs, education to normalize the common ebbing and flowing is key. Removing some uncertainty from the experience may also help minimize concerns about self-efficacy; as Lennox pointed out a lot of his frustration issued from the idea that he was doing what he was told to do but was not improving. Similarly, concussion protocols do not require athletes to be completely symptom-free before moving onto the next phase of recovery (McCrory et al., 2017), so normalizing this may also help athletes have more confidence in the recovery process.

While research on SRCs has progressed, many advancements have not been effectively communicated to the public, perhaps due to the sheer volume and complexity of information. Thus, misinformation and the lack of clear definitions continue to contribute to fear and anxiety that surround SRCs. An example is seen in Brandon's concerns of CTE and other potential long-term effects. Science on the topic of CTE has since advanced, contradicting the initial perception that a causal relationship exists between SRC and CTE (Merz et al., 2017). As recently highlighted by Belanger et al. (2020), media attention toward this relationship has facilitated misperception, and education on the status of CTE research (in which prevalence, causes, and clinical criteria are still largely unknown) is essential. Ultimately, some factors that play a role in undermining athletes' confidence and self-efficacy may derive from a lack of education or misinformation. While we argue that education by experts, MPCs, and/or sport officials with training in concussion is not the only solution to increasing confidence and self-efficacy around

recovery and return to sport, it may be a critical strategy to leverage. Recommendations for education strategies can be found in Conaghan et al. (2021).

Social Needs

Athletes and MPCs also discussed the influence of social factors on SRC recovery. Of note, social support and trust either facilitated or hindered recovery. One clear aspect across these two needs was the validation of experience. Athletes reported distrust towards SRC management team members when recovery strategies appeared ineffective or when athletes received inappropriate or ill-informed advice (e.g., Rose's experience with a counsellor). Defoe (2018) emphasized that clinicians should place trust in players' expressions of their experiences as they know their bodies and experiences best. Perhaps existing distrust toward athletes' reports could be related to cases of malingering (e.g., Silver 2012). However, questioning and undermining the athlete's experience may cause a host of problems that can elevate distrust between the SRC management team and the athlete, leading the athlete to feel vulnerable and isolated, while also receiving insufficient support (Caron et al., 2013).

Trust and social support were also discussed in the context of coaches and teammates, where validation and mutual understanding of experience affected athletes' recovery and connectedness to the team. Of note, it is possible that those in the best positions to offer positive social support and validation may lack an understanding of how they can be supportive. This is troublesome for several reasons, including (1) the risks of the social isolation (e.g., emotional symptoms; Davies et al., 2020), (2) the dangers reported when positive support is not available (e.g., internalization of negative discourse; Salas et al., 2018), (3) the reported lack of listening and emotional support (e.g., Corbillon et al., 2008), and (4) the importance of social support (e.g., in aiding recovery; Sanderson & Cassilo, 2019; Wiese-Bjornstal, 2010). As such, education

on ways of socially supporting athletes are necessary for teammates, coaches, and others in a position to offer support (Kita et al., 2020). As presented within this research, having the right kind of support at the right time is critical (e.g., informational, emotional, esteem-related; Sanderson & Cassilo, 2019). Resultantly, the importance of having a support system that is educated in SRC support throughout the injury should not be underestimated.

Practical Considerations

While the identification of psychological and social needs contributes to a greater understanding of athletes' SRC experiences, this information can also inform interventions and policy. For practicality, the following will be framed within the 11 'R's presented in the Concussion in Sport Group's consensus statements (i.e., *recognize, remove, re-evaluate, rest, rehabilitation, refer, recover, return to sport, reconsider, residual effects and sequelae, and risk reduction*). For additional information on these 'R's, please refer to McCrory et al. (2017).

A possible avenue whereby some of these psychological and social factors may be leveraged could be the development of an assessment of psychological readiness, to see how these and other needs are being addressed in *recovery* and during *return to sport*. At present, the concept of psychological readiness has not been effectively defined with regards to SRCs, but preliminary research suggests that psychological readiness in return to sport should include measures of anxiety (e.g., re-injury anxiety) and confidence (Caron et al., 2018). We argue that self-efficacy may also be a component of the psychological readiness puzzle, particularly in understanding athletes' beliefs in their abilities, and perhaps where their locus of control is oriented (i.e., internal or external regarding rehabilitation and outcomes). Assessments of these needs early in the injury process (i.e., *rehabilitation*) may help direct psychosocial interventions and support early and effective *referral* when a practitioner is not embedded. For example, an

understanding of the status of athletes' social support and trust in relationships early in the injury, or even pre-SRC (i.e., *risk reduction*), could help practitioners cater interventions and facilitate positive support relationships where needed (e.g., connecting them with other willing athletes who have experienced SRCs). In addition, psychological responses to injury regarding reductions in sport and team-related engagements appear to be similar across SRCs and musculoskeletal injuries (Turner et al., 2017), suggesting an opportunity for these kinds of assessments and interventions to be leveraged for other injuries. While the importance of social support for orthopaedic and SRCs has been highlighted (Kita et al., 2020), research into strategies to enhance such support across injury contexts is sparse.

Beyond psychological readiness, having measures and personnel in place to address psychological and social needs throughout concussion management is another important step. MPCs and other sport psychology professionals with training in concussion management are one possible avenue for providing this support. Recently, Seguin and colleagues (2022) published an article to serve as a resource for guiding MPCs' support strategies throughout concussion management (e.g., cognitive reframing, goal management). While embedded practitioners may not always be present, as is often the case outside of elite sport, establishing a referral network to encourage appropriate one-on-one support opportunities should be considered. Either in conjunction with this strategy or alternatively, bringing in a concussion expert to facilitate periodic training for coaches, parents, and/or athletes may help address some challenges related to misinformation, acceptance, and social support around concussion (Conaghan et al., 2021). Establishing peer support groups within teams and organizations may also be a way to facilitate positive social engagement and address some of the aforementioned needs (Kita et al., 2020).

Another consideration for advancements in support throughout recovery is a possible connection to the international Safe Sport movement. According to Safe Sport International (2021), part of protecting athletes is seeing and treating them as human beings *first*. This means creating a culture of acceptance and trust within sport environments so that athletes' physical, emotional, and mental health are safeguarded and prioritized (Bekker & Posbergh, 2021). While this movement is oriented toward violence and abuse in sport, the establishment and facilitation of social support and trust within these environments is equally important for athletes with SRCs. The experiences shared by the athletes and MPCs in this study, as well as the experiences highlighted in research on lived experience (e.g., Seguin & Culver, 2021) and sport culture (Breger et al., 2019), illustrate that there are still significant sociocultural challenges to be addressed. This means that the physical drive, associated toughness, and performance narratives that are internalized through elite sport engagement, engrained in sport culture, and reinforced by socialization (Doherty et al., 2016), are conflicting with SRC management strategies and the acceptance required by the athlete to effectively enact them. Ultimately, the shifts in sport culture that are being targeted through the Safe Sport movement may also help with *risk reduction* by creating conditions for improving SRC reporting, education, and support, while helping initiate a shift in athletes' prioritization of their health and wellbeing during *recovery*.

Conclusion

Concussion management strategies have evolved significantly over the last few decades but still bear a critical gap with regards to considering psychological and social needs. Through the consideration of athletes' and MPCs' experiential and expert perspectives, this study sought to clarify these needs. The needs of acceptance, normality, confidence, self-efficacy, trust in relationships, and social support were discussed, and may be particularly relevant for the phases

of *rehabilitation, refer, recover, return to sport*, and *risk reduction* in current concussion policies. While this study provides unique insight into psychological and social needs, it is not without its limitations. Given the focus on elite sport, the psychological and social needs shared through this study do not consider needs across other sport contexts (e.g., youth, adolescent sport). Consideration of the experiences of youth and adolescent athletes are currently underrepresented in concussion literature and should be investigated to support the development of age-appropriate strategies. Additionally, these focus groups included athletes or MPCs, not both. As such, an opportunity to combine perspectives and enable participants to engage across participant groups could have supported the identification and exploration of needs through live engagement, instead of being reliant on the authors' interpretations alone. Future research should continue to explore how psychological and social support can further enable concussion recovery. This should include further and deliberate consideration of how support strategies can be embedded across the graduated return to sport strategy and throughout the 11'R's from the Concussion in Sport Group consensus statements. Such investigations would be valuable in continuing to diminish the ambiguity surrounding when and how psychological and social needs could be met, while directly responding to current gaps in concussion protocols.

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Article 3: Psychological and Social Needs: Athletes' and Mental Performance Consultants' Perspectives on a Gap in Concussion Protocols

Seguin, C. M., Culver, D. M., Mellalieu, S. D., Christie, S., Goss, J., & Roorda, S. (2022). What's our role? Mental performance consultants' perspectives on supporting concussed athletes. *Journal of Sport Psychology in Action, 13*(3), 168-179. https://doi.org/10.1080/21520704.2021.1971811

Abstract

Bloom et al. (2020) advocated that mental performance consultants (MPCs) can play an important supporting role in the psychosocial recovery and well-being of concussed athletes. The rapid advancement of knowledge and limited resources designed for MPCs present challenges in facilitating this support. To address these challenges, a group of MPCs formed a community of practice to help define our role in this domain. In this article, we have attempted to translate our knowledge of concussion and related psychosocial support into an accessible narrative and approach that can help MPCs better understand our role in providing support to concussed athletes throughout the phases of return-to-play.

Keywords: *sport-related concussion, return-to-play, sport psychology, community of practice*

Sport-related concussion (SRC) is an injury whereby an incident (e.g., hit, fall) in sport participation produces biomechanical forces that are transmitted to the brain (McCrory et al., 2017). This sport-related injury can produce a diverse range of symptom experiences, including not only physical symptoms (e.g., headaches), but psychological, emotional, behavioral, and social consequences that can last days to years (Bloom et al., 2020). Further, the recovery trajectories of these injuries differ between and within individuals, posing a challenge to injury support teams (Kontos, 2019). Given the complexity of the injury and new SRC research being published daily, it is important to provide clarity for those in a position to work with concussed athletes, to minimize the murkiness that exists around this injury. As such, the purpose of this article is to help clarify the role of the mental performance consultant (MPC) in concussion support, and to share best practices and considerations for MPCs who are in a position to offer psychosocial support to concussed athletes.

As MPCs regularly provide psychosocial support to athletes and have been advocated as important professionals to support the SRC recovery process (Bloom et al., 2020), information regarding our role, scope of practice, and boundaries of competency within this complex injury domain is essential. To understand the MPC's position within the SRC landscape, a community of practice (CoP: Wenger et al., 2002) of experienced MPCs was cultivated. CoPs are designed around the creation, expansion, and exchange of knowledge between members with an expertise or passion for a shared topic (Wenger et al., 2002). The current CoP was designed to enhance understanding of the needs of concussed elite athletes, co-develop and critique strategies for supporting these needs, and improve the ability to provide psychosocial support over the course of an athlete's injury. The CoP (the six authors on this paper and two additional MPCs) met on a bi-weekly basis and comprised MPCs who have worked with concussed athletes in elite sport

contexts across a variety of individual and team sports. CoP meeting discussions centered on SRC symptomatology, research, and management efforts; professional scope of practice; intervention opportunities; collaboration with other professionals; case studies as presented by the MPCs; and collective best practices regarding psychosocial interventions, mental skills, and therapeutic techniques. Two external experts on SRC research and practice also contributed (a combined 38 publications on concussion and 20 years of practice), with presentations on current challenges in research and concussion management, collaborative care, and identifying and clarifying professional lenses; and participating in collaborative discussions to further our collective learning. To share our learning, this article was collaboratively undertaken to help translate knowledge from research and this CoP to those working within the mental performance field. The first section presents our proposed best practices in action following a hypothetical SRC injury. Specifically, we discuss a fictional athlete (Laura) and follow her concussion journey (from pre-injury to recovery) from the perspective of an MPC, while simultaneously presenting some strategies that MPCs can employ at various points throughout the injury timeline in response to her specific situations and/or symptoms. In the second section, we then present key considerations and challenges for optimizing MPCs' work with concussed athletes.

Case Study

Laura was a 21-year-old rugby union player in her 4th year on the varsity team. She was a full back, a position where she could use her strength, speed, and agility. She was viewed as a leader and took this role very seriously; she spent time reviewing video with her coaches, checked in with teammates and staff on how others were doing, and was an avid supporter of mental skills training and my role as the MPC with the team. In my second year with the team, I felt I had created good working relationships with the coaches, athletes, and staff. I provided

biweekly team sessions on mental skills, communication, group and team dynamics, and psychological recovery. My consulting philosophy blends core elements of Acceptance and Commitment Therapy and Cognitive-Behavioural Therapy, which helped support our focal points for the season: emotional intelligence, self-regulation, and mindfulness. I typically attended practice three times a week, weekly coach and staff meetings, and all the games where I could observe how the athletes and staff responded under pressure, checking their mental skill application and progress.

During a game Laura caught the ball at pace and was tackled below the knees by an opposing player. As she tried to fight off the tackle another opponent came to help the initial tackler, twisting Laura's body. Instead of making contact with the ground with a proper body position, she landed on her shoulder and her head snapped back and hit the ground hard. She lay on the ground motionless as the ruck formed on top of her. The referee stopped the play and called for medical attention. Initially, I saw no movement, but after she was assessed on the field, the athletic therapist helped her off slowly and they went to the locker room. Later in the half I went into the locker room to check on Laura. The therapist indicated that Laura was concussed but was doing “OK”, and that she would see the doctor after the game. The therapist asked if I could stay with Laura because she had to return to the field for the second half, as no other medical professional was available. Laura and I chatted for a few minutes and she told me that she was feeling OK. Laura said that her head and shoulder hurt; she admitted to being knocked out for a few moments but thought that the therapist was overreacting. Laura said she had never had a concussion before and this hit was nothing unusual in rugby. But Laura just wasn’t herself; she was repeating questions, seemed disoriented, and overly emotional. I encouraged her to relax, but she could not understand why she wasn’t going back in. I listened to her concerns,

empathized, and helped her focus on what she could control. I then suggested calming her emotions by using the skills we had practiced in our team sessions.

Later, a doctor, having confirmed Laura's concussion diagnosis, instructed her to rest for 24 to 48 hours, minimize screen time (excluding all screens if possible), avoid bright lights and loud noises, and to keep track of her symptoms and go immediately to the hospital if any of the symptoms got worse (e.g., headache, vomiting). That evening, Laura's headache got progressively worse, and she admitted to maybe having underplayed her symptoms and went to the hospital for follow up. At the hospital, scans and additional tests were conducted and she was kept overnight for observation. No brain bleeds were found and she was sent home the next day. In our integrated support team's (IST) weekly meeting, we discussed Laura's injury and our roles in supporting her for the first phases of her injury. My role was to check-in with her, offer psychological support where needed, and indicate to the medical team if I noticed any emotional or behavioral changes, particularly when Laura was transitioning to a new phase in the protocol.

The first few days following her injury, Laura was diligent about resting and staying off her phone but struggled with being physically inactive. She indicated that she was doing what the doctor and therapist had said but wasn't feeling any better. In fact, she felt stressed at the thought of her team competing without her, and was questioning how long her recovery would take. She said she was seeing the physiotherapist that day for treatment on her neck and shoulder, as they were both very stiff and sore. I told her that I was available if she needed anything and to feel free to text me even if she just wanted to complain about how she was feeling.

The next week, Laura had some ups and downs; she wasn't going to classes and started feeling alone and bored as she hadn't seen her teammates or friends for a few days. We revisited self-regulation and mindfulness techniques, and I helped her find ways to relax and breathe that

helped lessen her symptoms at times. She hadn't yet spoken to her parents, so I encouraged her to reach out to them as they had been supportive in the past. She told me that she didn't feel like she was progressing; in comparison to a previous ankle injury, she just didn't understand why she didn't feel better after 2 weeks. She was becoming increasingly frustrated and impatient. Laura continued to see the physio for her shoulder and neck, and after 3 weeks she started to feel better, and noticed her headaches were less severe.

Feeling a bit better, Laura decided to get out of her apartment and come to a game against our biggest rivals. She seemed alright with not being able to play and wanted to support her team. I stood with her on the sidelines during warm-up and she seemed in good spirits; the team and staff were happy to see her and commented on her looking better. During the first half, as I did my usual scan of the environment, I noticed Laura sitting down with her head in her hands. I approached her and she said she was feeling sick and that her headache was "fierce". I reported this to the athletic therapist, who said, "Too much, too soon", noting the loud crowd noise and excitement of the game had likely impacted her symptoms.

The next few days, following the acute strain of doing too much, Laura found her symptoms slowly improving. We spoke every two days and worked on some goal setting, positive self-talk, and continued our relaxation exercises. She said, "I am determined to do everything I can to get rid of my symptoms". She felt positive that she had been progressing with her mental skills and mentioned she was cleared by the doctor and therapist to start some light activity that week: just 20 minutes on the bike to see how she felt. Soon, Laura progressed to 40-minute bike rides with moderate intensity, some light weightlifting, and ball handling with some of her teammates, without any worsening or return of her symptoms.

After multiple guided progressions, she was cleared by the sports medicine physician for non-contact practice. The first week went well for Laura, despite being tired and a little more emotional in my view. After guided contact progressions with the athletic therapist, she was cleared for contact. Although we all expected her to be eager and ready to go, Laura struggled. She had a short fuse, was quick to be upset when she didn't perform perfectly, and ended many practices in tears. Before her injury, Laura was always confident while running through contact. Now, she was hesitating, recklessly passing the ball, or dropping the ball, which she would never have done in the past. After a particularly bad practice, Laura asked to meet to talk about her confidence. "It was such a normal play. It could happen again" she repeated. We explored those thoughts and I encouraged her to challenge them by exploring the evidence. Laura acknowledged she had been hit that way hundreds of times before and nothing had happened. We then built on her internal narrative and her ability to manage or change her self-talk. We worked on naming and understanding the emotions that came with fear, letting those thoughts go, and calming herself. After numerous sessions, Laura eventually realized that she continued to fear getting another concussion; she kept trying to imagine how her injury happened. I asked her "How did it happen?" Uncharacteristically, Laura couldn't answer. She admitted to not knowing exactly how she lost consciousness, or how she really got hit. She knew she took the ball into contact and wound up with her worst injury. Showing courage, Laura decided that she should watch the film and analyze how she got concussed. She admitted not having watched the injury film due to her fears and all the negative emotions around that hit. I asked, "Well, what if you were to watch it with the support of a coach, or a teammate?". She asked to watch it with me. We prepared with some breathing exercises; Laura watched it, kept calm, and began to analyze. Laura was very critical of how she fell and absorbed the contact from both tacklers. Rather than protecting the

ball and her head, she tried making a desperation pass as she was going down, something she had not done before. With a renewed sense of purpose, Laura devised a plan for if ever she was caught by two tacklers: she would either keep her legs moving or protect the ball and go to ground safely.

The following practice, Laura looked like her old self again. Looking back on our interactions, I was incredibly thankful for the relationship we had before her injury, and her willingness to lean on me as a source of support in her trying time. Her injury was not an easy one to overcome, but I found a strengthened confidence in how mental skills can support medically-guided rehabilitation and return to play protocols for concussion.

Key Considerations for Supporting Concussed Athletes

In this next section, we present considerations for supporting an athlete with SRC through the phases of the psychological response to injury model: injury onset, rehabilitation, and return to sport (Wiese-Bjornstal et al., 2015), after discussing how potential support can begin prior to the SRC occurring (pre-injury).

Pre-Injury

The quality of the existing relationships between the MPC, the athlete, and various stakeholders (e.g., teammates, coach, IST) prior to the SRC will impact the MPC's ability to successfully support the athlete following their SRC. Therefore, a key challenge for an MPC is how they build and maintain athlete and team relations. Good quality relationships allow for: an effective therapeutic alliance to be established with the client, supporting any potential interventions provided at concussion onset; an understanding of any potential factors (e.g., current stressors) which may predispose the athlete to have a higher potential for injury (Ivarsson et al., 2017); and, potential inclusion in the SRC management process due to a greater presence

within the IST (as seen in Laura's story). Where the MPC may not be embedded within a team or squad of athletes and the support request comes from a referral, building a network of suitably qualified practitioners to draw upon is essential.

The degree of presence, visibility, and successful immersion in the athletes' environment (i.e., practice and games) is especially important for building a relationship that will facilitate the ability to support concussed athletes. MPCs may not only 'have sight' of a suspected SRC but, because of strong relations with the athlete and a good understanding of that individual, be able to identify abnormal variability in athlete behavior (i.e., potential symptoms) that may provide valuable information for the clinical team. That said, although MPCs are in a position to inform a diagnosis, they should not diagnose, nor give advice on clinical/medical SRC treatment or management. Ongoing presence by the MPC can also 'normalize' the MPC's role in the immediate SRC identification and management process, and play a role in facilitating a psychologically safe climate where athletes are comfortable disclosing their injury experiences. Given that intra-personal factors (e.g., lack of knowledge, internal pressure) have been associated with disclosure (Kerr et al., 2014), the MPC can also play a role in educating athletes regarding concussion knowledge and management, which may be of particular importance for adolescent athletes (Ferdinand-Pennock et al., 2020).

A final consideration for an MPC's practice pre-injury is their own knowledge and understanding of SRCs and concussion management (i.e., symptoms, behaviors; track, court, or pitch-side protocols; medical concussion management rules). Resources like the latest Consensus Statement on concussion in sport (McCrory et al., 2017), practical guidance on first aid triage (e.g., Hockey Canada, Concussion Legacy Foundation apps), and the specific injury protocols from the MPC's team or sport will assist in developing this knowledge and understanding.

Additional educational tools are also openly available (e.g., Massive Open Online Course on Concussion by l'Université de Laval and the University of Calgary) which can support MPCs' understanding of the injury from experts from other concussion-related domains. As an example from our CoP, having education from and discussion with external experts helped provide insight into concussion procedures and experience that spanned beyond our discipline, helping to clarify our role in the larger scheme of the injury. When informed, MPCs can help educate athletes on what to expect, while removing unnecessary additional anxieties around uncertainty. A challenge for an MPC here is identifying and advocating for their role in the SRC management process within a particular team or group. The development of MPC-specific education (e.g., SRC "first aid" for MPCs) would help inform MPCs about their role in SRC management processes, and may be especially important for MPCs not embedded within a team or IST.

Injury Onset

When a concussion occurs the MPC may be the first point of contact with the athlete. The athlete may disclose the injury to the MPC, another athlete might raise concerns about a fellow athlete, or the MPC might observe signs and symptoms. Thus, we suggest the potential role of the MPC could be in providing immediate, onsite emergency care or psychological 'first aid'. MPCs may be able to assist the medical team in identifying symptoms that might have been missed (e.g., behavioral change that would not be known without knowing the athlete pre-injury). Importantly, the MPC must know their role and stay within their scope of practice (e.g., not give advice on medical matters). An understanding of a team or sport's concussion protocols, as well as the roles of other concussion management team members (e.g., athletic therapists, sports medicine physicians) can help in this regard.

Following contact with the athlete, irrespective of the context, the next stage of psychological first aid, if the process hasn't already occurred, is to encourage the athlete to see a doctor for diagnosis. If there is no access to medical support, the athlete should be encouraged to go to the hospital. There may be issues around confidentiality at this point, as the athlete may have chosen to disclose in confidence and not want the medical team to know. MPCs should prepare in advance for such scenarios and identify clear and ethical strategies to ensure the welfare of the athlete. This may include developing an ethics section, which can be included in a confidentiality statement provided to the client (organization/team when embedded) to address such boundaries of competency.

Immediately post-concussion, the MPC may also be in a position to support the athlete. This might include accompanying the athlete to the hospital or staying with them in the medical waiting room. Emotional support through listening and maintaining communication, or helping the athlete shift environments (away team/overnight stays, competitions/events, etc.) may also be important. Again, as MPCs in these contexts, we are not responsible for the athlete's physical health, and there are clear established boundaries for medical roles. Instead, it is important for the MPC to be fully briefed on the team or sport's medical plan/protocol for such occasions, and provide support as needed.

Rehabilitation

Following the acute injury onset phase, the MPC may support the concussed athlete through their rehabilitation. At this phase, it is important to understand the athlete's position within the concussion protocol to consider which social, psychological, emotional, and/or behavioral factors may affect recovery and which strategies should be implemented at which time. One important strategy when starting rehabilitation is psychoeducation; this may involve

the practitioner educating themselves to lead conversations regarding SRC experiences and helping the athlete understand and normalize their symptoms. Psychoeducation could also involve providing information or concussion resources (e.g., web resources), providing the athlete a degree of control/autonomy in their recovery; as well as to educate, inform, raise awareness, and provide assistance. The concussed athlete is also likely to experience a range of symptoms and the MPC can help the athlete develop strategies to manage these symptoms (see Table 1 for common strategies used by practitioners with their concussed athletes' symptoms, experiences, and needs; cf. Seguin, & Durand-Bush, 2019).

As with other injuries, beyond the MPC providing direct support, they can facilitate the athlete's engagement in social support networks. For example, connecting the athlete with another injured athlete; or encouraging coaches, teammates, to reach out. An additional function of the MPC in the rehabilitation phase, is to gauge how the rest of the team or support staff is interpreting the situation and the SRC experience. Having a social and cultural understanding of the athlete's environment will further facilitate and refine any psychological-based interventions the MPC has designed in conjunction with, or in addition to those of the medical staff, helping ensure a positive and supportive climate.

The complex nature of concussion often results in a longer rehabilitation than expected, and in some cases, eventually necessitates exit from the sport. An MPC may be able to offer longer term support in these cases; for example, MPCs who have an established referral network (which requires an understanding of the roles and responsibilities of other care providers in concussion support; e.g., neuropsychologists) may be able to provide a clinical referral to an athlete who is experiencing mental health issues that may result from prolonged concussion experiences. The facilitation of resilience and coping skill development (e.g., including life

Table 1.

Common Psychological Skills and Techniques Used by MPCs

Symptoms/Experiences/Needs	Psychological Skills	Common Skills and Techniques	Additional Considerations
• Identify symptoms & symptom triggers • Behaviors which limit exposure to symptom triggers • Behaviors that lead symptoms to worsen	Self-Regulation	• Self-monitoring (e.g., daily symptom/behavioral logs; activity and symptom threshold documentation)	Logs may be better completed as recordings or the with support of a friend of family member if typing or writing is too strenuous
• Controllability/locus of control • Inability to see progress • Well-being mindset and leveraging performance mindset to adhere to rehabilitation protocols	Goal-Setting/ Goal-Management	• Support goal development and adherence with medical team/ return-to-sport protocols • Emphasize "revisit, revise" of SMARTE**R** goals for flexibility in recovery process	
• Pain/muscle soreness • Headaches • Decreased arousal • Counter stress response • Energy conservation • Manage sleep disturbances • Challenge fatigue • Heightened emotions	Relaxation	• Active or passive progressive muscle relaxation • Breathing exercises • Meditation	Neck or other muscular strains (e.g., if injury included whiplash), may affect abilities to use active progressive relaxation techniques
• Internal dialogue • Locus of control • Attention/focus	Self-Talk	• Reframing negative self-talk • Focus on process vs. outcomes • Affirmations to normalize experience	

• Skill maintenance • Resilience • Recovery • Enhance rehabilitation effectiveness • Manage emotions/pain	Imagery	• Abstract or targeted healing imagery • Mental practice of rehabilitation exercises and outcomes • Sport-specific mental rehearsal	Sensitivities may be experienced in response to imaging bright lights, rotating or spinning images, and should be avoided if symptom-provoking
• Acceptance • Present-focused • Non-judgmental of recovery process	Mindfulness	• Centering • Informal or formal meditation exercises/audio • Labelling emotions and thoughts	

Note. The skills presented have been adapted from Seguin & Durand-Bush (2019), include others as identified in the included narrative, and represent common skills and techniques used by practitioners to support their concussed athletes' symptoms, experiences, and needs. The skills presented are not intended as an exhaustive list.

balance, identity development) may also be beneficial to an athlete transitioning from sport. Here, different resources and referral options may be necessary while MPCs stay within their scope of practice. Education on SRCs and open communication with clinical care providers will help illuminate when referrals may be necessary.

Return to Sport

In the return to sport phase of an athlete's recovery from SRC, MPCs should build on the mental skills developed prior to injury and in earlier injury phases, and support the athlete in developing a set of strategies to deal with return-to-sport demands. As with all stages of recovery, the athlete's return to sport should be medically informed and psychologically supported. A number of stressors are commonly experienced as athletes return to sport; for example, fear of re-injury, returning to pre-concussion performance levels, and general internal and external expectations (Podlog et al., 2011). To manage these stressors, a number of coping skills can be fostered to help the athlete maintain motivation and enhance confidence (see Table 1). The MPC has a role in facilitating an athlete's psychological readiness to return to play. Return to sport is often a non-linear process and the athlete may be prone to re-injury. Psychologically, re-injury presents a new set of stressors, in addition to the athlete having to repeat various stages of the graduated return to play protocols, with often more intense psychological and physical processes (e.g., heightened anxiety).

Once the athlete has successfully returned to sport, the MPC has a role in continuing to help the athlete maintain or manage their performance expectations. If the MPC is within the athlete's environment, they may observe the athlete as they resume training and competing, and observe reactions to challenges upon sport re-entry.

Concluding Thoughts

In offering specific suggestions for the role of the MPC in supporting concussed athletes we hope we have identified that we as MPCs can not only support the athlete themselves, but also the athlete's environment. Indeed, there is a need to consider the social and cultural factors that impact each aspect of the athlete's SRC experience, as well as the MPC's level of competency. Also helpful is the consideration of the level or ability of the athlete (elite, amateur, collegiate, youth sport) as this will affect what resources/network the athlete is able to access. This may be especially pertinent for those transitioning from sport or out of an elite context, where the ability to access a support/resource network is likely greatly affected by the social resources available. In addition, where athletes are not part of a team or squad environment and the MPC has provided support through private or individual referral, we urge MPCs to look at how they can facilitate client access to such resources. Here, scope relies on the development of suitable resources for both athletes and MPCs to aid such processes. Finally, irrespective of the context of support, we reiterate the importance of the MPC operating within the boundaries of their competency, which requires a thorough understanding of the injury, accompanying protocols, and the multidisciplinary team members who work within this domain. As MPCs, our role is not to diagnose or guide treatment for concussed athletes, but to support them through their experiences.

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Article 4: Knowledge translation and the untapped resource: Exploring the value of a community of practice for mental performance consultants

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Abstract

This research highlights the potential significance of leveraging communities of practice for supporting ongoing learning and advancing professional practice. As formal communities of practice are rare within the mental performance field, this held a unique opportunity to understand the value gained from active engagement in intradisciplinary collaboration. It also posed as an opportunity to share how professionals seeking to develop knowledge in niche domains of practice might leverage similar forms of social learning spaces. These two purposes inspired this qualitative case study. Our community of practice comprised a group of eight experienced mental performance consultants from elite sport with the goal of understanding and exploring our role in supporting athletes with sport-related concussions. Individual reflections and collaboratively developed documents were thematically analyzed using the Value Creation Framework (E. Wenger-Trayner & Wenger-Trayner, 2021) to assess the value created through CoP participation. Positive value across all eight cycles of the framework was identified (e.g., identification and clarification of our role in concussion support – transformative value; critical boundaries within the practical and theoretical concussion landscape – orienting value). Through this article, we explore these values in an effort to provide insight to practitioners of various disciplines of psychology wishing to create similar social learning spaces.

Key words: *Professional development, social learning, value creation framework*

Public significance statement: This article highlights the experiences of mental performance consultants who participated in a community of practice designed to explore a niche area of professional practice (i.e., concussion support). Reflections from those who participated illustrate

value in learning, knowledge translation, and applied practice, while also identifying structural elements which made the CoP successful.

Methods of continuing professional development in domains of applied practice span beyond formal continuing education courses and may be considered as part of a lifelong learning journey. Quartiroli and colleagues (2021) defined lifelong learning as an ongoing exploration and engagement in information-seeking and self-reflective activities that align one's curiosity and desire for development. The opportunities and activities making up these lifelong learning journeys are diverse and become particularly relevant for those interested in niche domains of practice (e.g., supporting athletes with concussions). As niche domains like concussion support require considerable theoretical, professional, and practical expertise, the practitioner offering support must independently pursue learning methods and activities which enable appropriate, effective, and ethical practice (Hatcher et al., 2013).

Some challenges of pursuing learning in niche areas include the identification of formal learning opportunities, an increased responsibility on the practitioner to sift through substantial amounts of evolving literature, and a necessity for longer and ongoing learning engagements to develop necessary competencies (Buttars et al., 2021; Cotterill & Keegan, 2020). One possible method of building competencies and supporting practitioners' lifelong learning is to leverage social learning spaces like communities of practice (CoPs). One such CoP was developed as part of a larger collaborative inquiry on psychological and social aspects of sport-related concussions (SRCs; [masked for review]). This CoP was designed to help practitioners (specifically mental performance consultants) respond to the aforementioned niche challenges by affording learning for professional practice, specifically for supporting elite athletes experiencing SRC ([masked for review]). As formal CoPs like the one within this project are rare and limitedly researched, the main purpose of this article is to explore the value the CoP had in supporting professional development and lifelong learning in a niche area of applied practice. A secondary purpose is to

share strategies applied within this CoP to help guide practitioners of various domains of psychology who may seek to develop their own CoPs. In order to situate the research, the following subsections start by contextualizing knowledge and the challenge of knowledge translation within lifelong learning for applied practice. Subsequently, we explore social learning spaces (e.g., CoPs) as a tool for promoting knowledge and supporting knowledge translation.

Knowledge and Knowledge Translation

To understand why a CoP approach was undertaken for this niche area of practice, we situate this practical learning challenge within the context of knowledge and knowledge translation. The concept of knowledge is nuanced and contextually-dependent, as demonstrated by the historically diverse perspectives in philosophy and psychology. Given the social nature of professional development and the framing of lifelong learning, we ascribe to a definition of knowledge that encompasses socialization. Rather than a static object, knowledge "lives in the act of human knowing" (Wenger et al., 2002, p. 8). Knowledge is tacit and explicit, with tacit knowledge consisting "of embodied expertise - a deep understanding of complex, interdependent systems that enables dynamic responses to context-specific problems" (Wenger et al., 2002, p. 9). Tacit knowledge incorporates experiences, making it an integral piece of practice and competence (Barnett et al., 2007). Knowledge development typically depends on continuing professional development opportunities (e.g., formal courses, informal learning experiences; Cotterill & Keegan, 2020) self-reflection (Knowles et al., 2007), and the social context of that knowledge (Wenger et al., 2002). However, knowledge may be difficult to develop when these experiences are not easily identifiable or accessible, or when they exist in a limited capacity.

The Canadian Institutes of Health Research (CIHR) define knowledge translation as "a dynamic and iterative process that includes synthesis, dissemination, exchange and ethically-

sound application of knowledge" (CIHR, n.d.). In other words, knowledge translation is an active and critical process in enabling knowledge to become tacit, contextualized, and applied. When formal experiences are not available as vessels for facilitating knowledge translation, the responsibility for developing knowledge about niche domains falls to the practitioner, who is required to engage in entirely self-regulated learning and sift through substantial amounts of literature to determine what is relevant for practice. Further, this is typically done in isolation where the benefits of collaborative learning (e.g., critical discussions, collective refinement of strategies, deeper learning; Karantzas et al., 2013; Schoor et al., 2015) are absent. Therefore, the challenges for learning within niche domains of practice are related to both the nature of knowledge and the act of translating it to practice. As such, there is an apparent need to leverage strategies which have been documented to improve knowledge translation and move beyond the inefficiencies of self-regulated learning alone; one effective means through which both have been addressed is by way of social learning spaces. In particular, as continuing professional development methods continue to diversify and calls for embracing lifelong learning throughout professional careers continue (Quartiroli et al., 2021), social learning spaces like formal CoPs which embrace collaborative, lifelong learning approaches may be relevant for responding to these calls and negotiating the challenges of knowledge translation.

Social Learning Theory, Spaces, and Communities of Practice

Social learning theory assumes that humans are social beings, knowledge represents competence which is developed through a variety of engagements and experiences, and social engagements are critical tools for promoting learning (Wenger, 1998). As social learning theory has evolved, it has come to consider different types of social learning spaces as vehicles of learning. These might include workshops, think tanks, conference meetings, or CoPs, all of

which offer different experiential learning opportunities. While all may be important means of knowledge translation, it is important to distinguish CoPs from other social learning spaces (e.g., workshops, think tanks, conference meetings) to understand their potential value with regards to theoretical and practical applications and contributions.

While both CoPs and other social learning spaces have documented benefits to personal and professional development, and for providing valuable learning opportunities for participants with differing levels of expertise, there are some distinct differences. According to E. Wenger-Trayner and Wenger-Trayner (2021), CoPs refer specifically to ongoing learning partnerships related to a specific practice. These learning partnerships develop through multiple participant engagements over time and involve a commitment toward the creation and advancement of shared practical knowing. A CoP is a community of inquiry which serves "as a living repository for that knowledge" (Wenger et al., 2002, p. 9), whereby participants engage in cycles of collective and individual action and reflection. In contrast, other social learning spaces do not require longevity, continuity, or such cycles. In addition, a regime of competence exists within CoPs, whereby members of the community with differing levels of expertise engage with one another to address challenges, problems, and practical strategies. While other social learning spaces may include participants of various levels of expertise, competence is less central to these forms of engagements (E. Wenger-Trayner & Wenger-Trayner, 2021), making them less ideal for developing knowledge within niche areas of practice. While research has shown that opportunities to share best practices in a co-operative context can make a valuable contribution to learning in applied sport psychology (e.g., Poczwardowski & Lauer, 2006), the use of CoPs to promote the sharing and co-creation of specific knowledge has not yet been documented. This is surprising given that CoPs have been widely used in fields such as medical (Cruess et al., 2018)

and teacher education (Trust & Horrocks, 2017), business (Harris et al., 2017), and sport (Duarte et al., 2021) for this express purpose. With such research documenting the benefits of informal learning processes like the ones afforded in CoPs (e.g., conversation, coaching), it is timely that this form of professional development be explored in psychology.

In 2003, a step toward exploring social learning spaces in sport psychology was undertaken for the first time; a sport psychology think tank was conducted over three days to enable personal and professional learning, meaningful exploration, and service delivery exploration (Poczwardowski & Lauer, 2006). Through this think tank, established and novice sport psychology professionals, as well as experienced coaches, met to share lessons from their work in competitive sport settings. Anecdotal reflections from this think tank suggested that participants experienced knowledge gains related to service delivery, improvements in the understanding of sport psychology services, as well as personal inspiration and growth. Notably, this social learning opportunity was characterized as important and valuable, not only to those involved, but to the field of sport psychology (Poczwardowski & Lauer, 2006). Given the reported value of this short engagement, we anticipated that a CoP which offers ongoing interactions about a niche area of practice would be worth exploring as a professional development tool, providing the impetus for this research.

The Case Study: A CoP for Mental Performance Consultants

To explore the value a CoP could have in supporting learning in a niche area of professional practice, a CoP for mental performance consultants (MPCs) on supporting elite athletes experiencing SRCs was undertaken. MPCs are professionals trained in the fields of sport psychology, consulting, and counselling, who deliver training on skills across emotional, psychological, and social domains (Quartiroli et al., 2019). MPCs are often employed by and

embedded within elite sport teams to enhance individual and team performance, as well as manage obstacles (e.g., challenges in team communication, injuries) typically through the use of psychological skills training and psychoeducation (Kraft et al., 2021). Support may be provided in the form of workshops, groups sessions, and individual interventions based on the context (e.g., sport, athletes, performance needs, previous experience, resources, time), the MPC's philosophy, and whether the MPC is working under contract or independently (Castillo et al., 2022; Seguin et al., 2022). As a result of their prominence in elite sport environments and relevant professional expertise, MPCs were considered an ideal population for the larger study on exploring support strategies for elite athletes experiencing SRC. This provided the opportunity to explore the value of a CoP in supporting lifelong learning efforts and knowledge translation around a niche area of practice, while also potentially informing other practitioners across disciplines of psychology who may wish to undertake a formal CoP.

Following ethical approval from the university's research and ethics board, MPCs were sent an invitation via email to participate in a CoP about working with elite athletes who experience SRCs. Ultimately, a group of eight experienced MPCs[5] consented to participate and formed our CoP. For details on recruitment, demographics, and the CoP goals and proceedings, please refer to Figure 1. Throughout the CoP, MPCs completed individual reflections to share their experiences of participating in the CoP, which provided an opportunity to assess the value of this engagement. Given the rarity with which CoPs have been used for knowledge translation and creation within mental performance and SRC communities, the purpose of this paper is to explore these reflections to understand the value of participating in a CoP designed for MPCs.

[5] At the time of the study, the CMPC® certification process had not been fully ironed out for professional members of the Canadian Sport Psychology Association. Thus, when the study commenced, most of the MPCs did not have the certification, while most have since earned the title.

Qualitative Case Study

To explore the value of this CoP for its participants, a qualitative case study on the value gained from participation was undertaken. According to Stake (1995; 2005), case studies are useful methodological approaches for exploring unique cases while empathetically preserving the multiple realities of the case. This approach is useful in providing in-depth insight into experience within a particular context, which can facilitate the understanding of something larger (Nikander et al., 2022; Stake, 2005). Case studies have regularly been used within sporting contexts to advance understanding of experience and learning (e.g., O'Sullivan et al., 2021; Samuel, 2018). In particular, case studies of this nature have been useful in understanding a variety of unique social learning spaces (e.g., Kraft et al., 2020; Pierce et al., 2017), and in informing future research and educational approaches. In our case, the goal was to explore the potential value of social learning spaces (e.g., CoPs) as a method for professional development for MPCs. In an effort to assess the value for the MPCs in our CoP, MPCs completed weekly reflections (in response to the question: "what is something that you took away from this meeting and/or applied to your practice?"), value creation stories (personal reflections completed throughout the CoP on specific activities within meetings that related to personal and/or professional development; Wenger et al., 2011), and personal value narratives (completed after CoP meetings ceased to reflect on individual members' overall experience; Wenger et al., 2011). Table 1 provides examples of the types of reflective questions, MPCs' responses, and some additional data. Related to the purpose of this paper, thirty-four single-spaced pages of data were generated as a result of participant engagements over the four-month duration of the CoP. Given the nature of the information gathered for this study and to protect the confidentiality of the

participating MPCs, pseudonyms have been used within the article and are available upon request to a qualified user.

Assessing Value

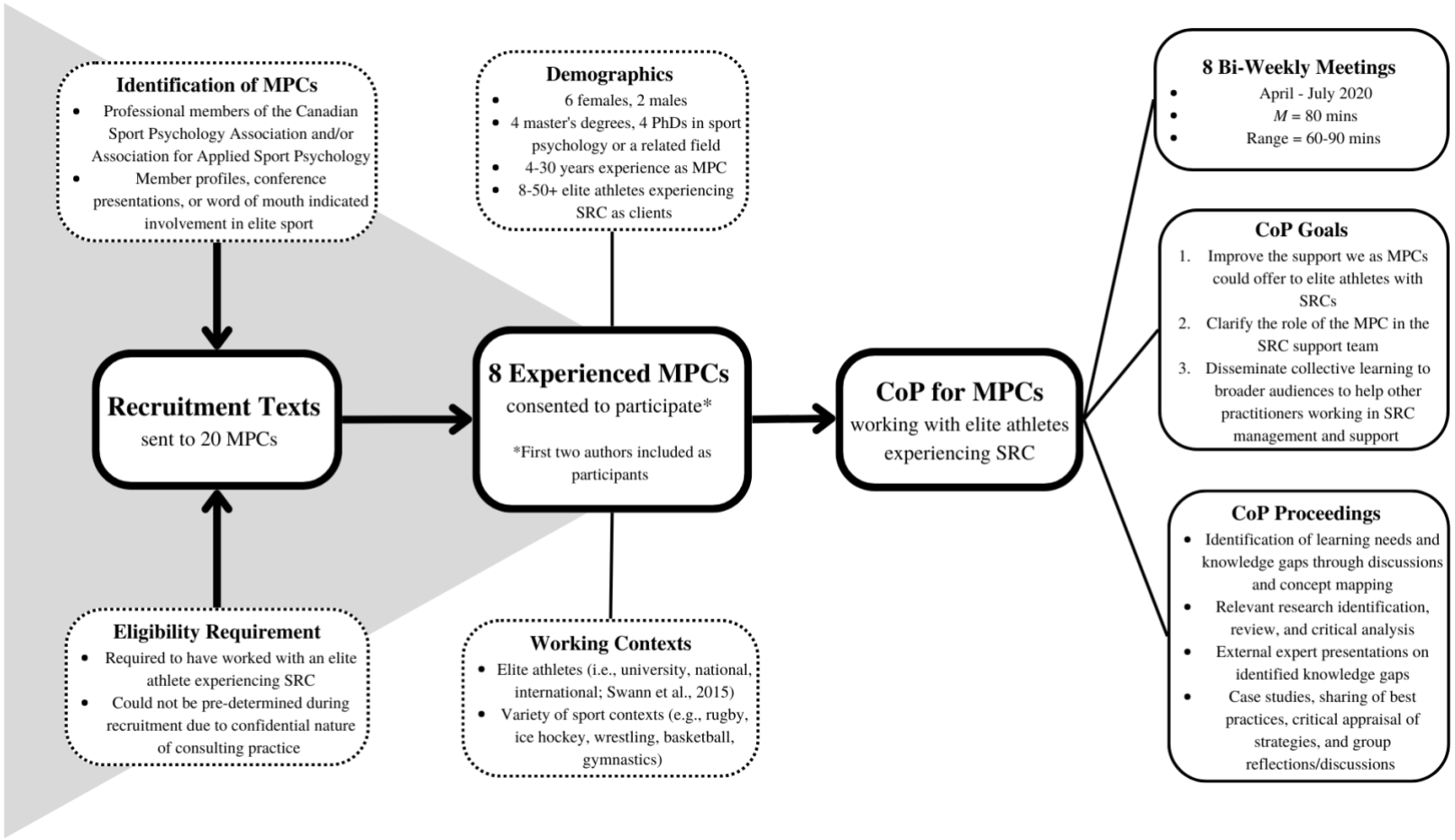
The Value Creation Framework (VCF) was selected for analyzing the generated data. The VCF is a comprehensive framework through which the stories of individual and collective experiences within CoPs can be explored, while understanding what values are created through CoP participation (Bertram et al., 2014). The use of the VCF allows for a structured approach to framing and understanding learning; given the purposes of this article, this kind of value assessment tool was deemed ideal. The VCF has been used in other research disciplines to explore the value participants may gain from engaging in social learning spaces (e.g., CoPs; Bertram et al., 2017; Guldberg et al., 2019). To our knowledge, this is the first paper to use the VCF (B. Wenger-Trayner et al., 2019) to assess the value of this type of learning for MPCs.

To understand the experience of value, the VCF considers eight cycles (i.e., immediate, potential, applied, realized, enabling, strategic, orienting, transformative values; see Figure 2 for an illustration of the cycles, their central consideration, and key experiential questions.

The key experiential questions illustrated in Figure 2 guided the deductive thematic analysis (Braun et al., 2016) of this data. First, the data were reviewed by the first author in conjunction with listening to audio recordings from the CoP meetings to familiarize herself with the data generated. Next, she created initial codes in the data. For example, “increased confidence” was noted as a code when a participant expressed “I also feel that this has made me more confident in what I am doing”. Third, the first author created initial themes based on these codes as they might relate to the VCF. Once these initial themes were developed, the first and second author reviewed the codes and associated themes, refining them through critical

Figure 1.

CoP Context



Note. Illustration of the CoP research context. Identification of MPCs and eligibility requirements for participation are defined, which resulted in the eight included MPCs. Demographics, consulting experience, and work contexts of the MPCs are presented. Information

regarding the timing of the meetings, the goals of the CoP and key elements of the proceedings of the eight meetings are presented. Of note, the CoP meetings encompassed a variety of proceeding strategies that were adapted and selected based on the goals of the meeting, which were collectively determined as the CoP evolved.

Table 1.

Data Generation Questions and Responses

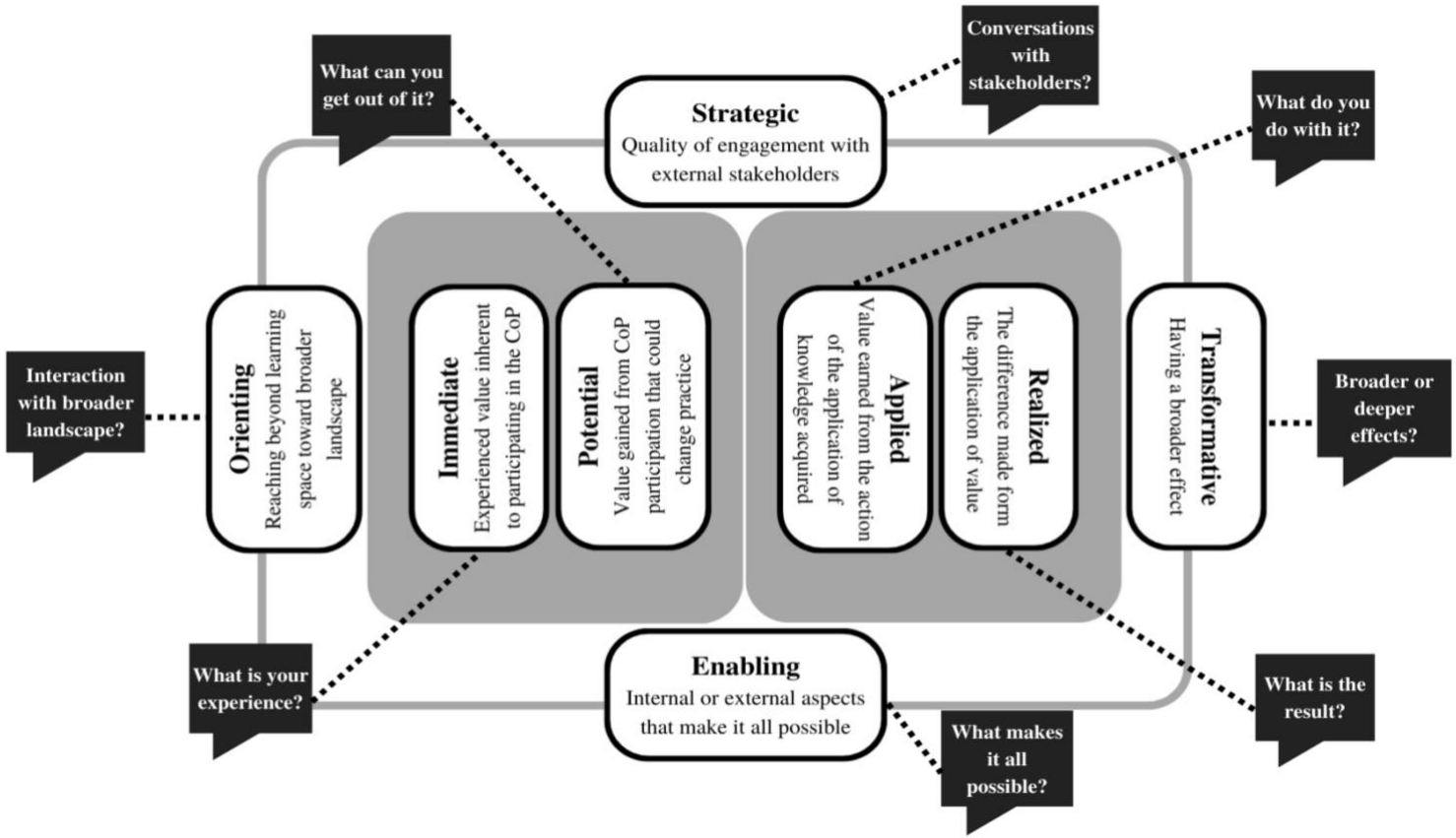
Reflective Activity	No. of MPC Responses	Example Questions from Reflective Activity	Direct Quotes from MPC Reflections
Weekly Reflective Question	23	What is something that you took away from this meeting and/or applied to your practice?	*"Just how complicated the concussion recovery process can be and that there is really no set way. You need to be nimble and adaptable to what your client needs."*
Value Creation Stories	6	Tell us how you used this resource in your practice and what it enabled that would not have happened otherwise.	*"I will use this to refer back to as I start with new teams, when working with concussed athletes, when educating on the impact of concussion, and to reflect throughout and when I complete the process of working with concussed athletes."*
		Describe a specific resource this activity produced for you (e.g., an idea or a document) and why you thought it might be useful.	*"The article [we created] for best practices working with concussed athletes. It will be useful to me and the larger sport psych community who may not be fully aware of how to work with concussed athletes."*
Personal Value Narratives	6	In relation to my original **reasons for participation**, how is participation changing **me as a professional** (e.g., skills, attitude, identity, self-confidence, feelings)?	*"I always want to help out people doing research as I remember what it was like trying to get people to participate. I am certainly always interested in gaining more knowledge in areas that my clients have issues in. I feel that it certainly provided me with some more skills, resources, and confidence."*

	In relation to **activities, outputs, events, and/or networking,** how is participation helping **my professional practice** (e.g., ideas, insights, material, procedures)?	*"Some of the resources shared across the CoP will be particularly useful for the psychoeducation work I undertake with my clients. The CoP has also helped me to look at how I manage the referral process of my athletes to clinical health care professionals."*

Note. Breakdown of MPCs' responses to reflective activities, as well as example questions and answers from each of the reflective activities.

Figure 2.

Value Creation Framework



Note. The eight value creation cycles as presented in the Value Creation Framework (E. Wenger-Trayner & Wenger-Trayner, 2021). A description of each cycle and corresponding key experiential question is provided for each.

Table 2.

Results of the Thematic Analysis

Theme	Value Cycle	Number of Codes	Subthemes
Ongoing Learning	Immediate	17	Engaging and learning with others; Appreciation for learning opportunities
	Potential	62	Consulting philosophy and resources; Change and innovation (MPC's role)
	Applied	11	Adaptations to consulting practice
	Realized	21	Footing and connections within broader landscape (e.g., with stakeholders); Evolution in personal/professional practice approach
Contributors to a Successful CoP	Strategic	2	Interacting with other professionals to broaden collective learning goals
	Enabling	9	Internal and external social learning support
	Orienting	2	Identifying critical boundaries in the broader landscape
Advancing Professional Practice	Transformative	4	Critical re-appraisal of the MPC's role within the landscape; Empowerment to broaden the difference members care to make

Note. Presentation of code divisions and associated themes from the thematic analysis (Braun et al., 2016) of the data using the VCF.

discussion and comparison to the cycles expressed in the framework (e.g., in the instance of increased confidence, "Potential Value"). After these discussions and comparisons, the first author returned to the data, organizing codes and themes into the VCF cycles. The final phase of the analysis encompassed the writing of the current article, whereby additional review and categorization of themes were discussed with the third author, and presented in the results section below. This process generated 128 codes, which were divided into three themes: ongoing learning, contributors to a successful CoP, and advancing applied practice. Each of these themes encompassed one or multiple cycles of the VCF (see Table 2).

Identified Value

Ongoing Learning

The theme of ongoing learning included immediate, potential, applied, and realized value cycles. One hundred and eleven codes were categorized into these four value cycles, and included examples of how the CoP promoted and supported ongoing learning for the MPCs. Largely speaking, engagement in diverse learning opportunities and interaction with those within and outside of the consulting community was supportive of participants' ongoing learning. As one MPC pointed out, the CoP was able to facilitate discussion and the sharing of resources:

> I appreciate being able to access new information via the list of books, special issue journals, presentations by specialists, as well as our peer discussions. The SRC rehabilitation field is a fast-moving environment, and it is difficult to keep pace with all the latest and greatest. Therefore, the sharing of information is critical! (Iliza, Immediate Value)

As described by Iliza, the immediate value of being able to interact with relevant and current information appeared to be an asset to MPCs in the CoP, particularly given the pace at which the

field of SRC support is advancing. Several other MPCs identified examples of immediate value, including their appreciation for learning opportunities presented within the CoP, as well as the frequent engagement with other MPCs from elite sport. Active participation in the CoP also seemed to provide opportunities for potential value. As Jennifer pointed out:

> I know that I have to continually review what the most recent recommendations are in terms of SRC management from a physical perspective and adapt with that. I will review the literature as well as speak directly to the physicians. (Potential Value)

While Jennifer had not yet implemented this concept, the CoP discussions helped her recognize the importance of engaging with SRC management protocols and experts. Other potential value examples included possible changes to consulting philosophy, future engagements with other service providers, and the importance of empowering athletes during recovery. For example,

> I liked that [External Expert 1] brought the concept of equity into her presentation. For me, it really drove home the point about the need for practitioners to be sure that each athlete gets access to what they need to achieve a desired outcome. Naturally, not every athlete is the same, nor do they face the same barriers. Add to that the inherent complexity of SRCs, and it's critical to customize the approach and empower the athlete to exert autonomy over the decision-making process. (Nicole, Potential Value)

Some MPCs were able to take these types of potential values further by actually applying them to their practice. As one MPC noted, “these sessions have helped me reconsider the importance of professional liability, the value of check-ins, and paying close attention to symptom progress with clients” (Patrick, Applied Value). For Patrick, engagement in the CoP prompted him to reflect critically on aspects of his current practice which prompted thoughts about future interventions. Other MPCs were able to see outcomes from applications similar to this. An

example of this form of critique can be seen in this reflective quote:

> "The CoP has definitely helped to crystalize how I approach my practice and support concussed athletes. Not necessarily at the technique/intervention level, but more so thinking about the overall framework for how to support concussed athletes, and where my boundaries of competencies lie." (Eric, Realized Value)

While innovation in tools and techniques were not central for Eric, having engaged with MPCs, invited experts, and other opportunities within the CoP helped broaden his view of service provision. Overall, these examples across the immediate, potential, applied, and realized value cycles highlight the value of the CoP in facilitating ongoing learning for the participating MPCs.

Contributors to a Successful CoP

Based Based on the VCF, results from the strategic, enabling, and orienting value cycles highlight elements of experience that represent values in fostering a CoP. In all, 13 codes were identified across these three value cycles. Generally, codes in these cycles were related to the design and facilitation of the CoP. For example, Madison explained that "all discussions throughout the CoP have been meaningful. Each conversation built on the last and really helped us to refine our thoughts and be able to put them into best practices" (Enabling Value). In other words, the flow of the CoP from one meeting to the next enabled the group to build on previous discussions, ultimately enabling further learning. This continual building on concepts and critical discussions helped make the learning that took place increasingly meaningful for the MPCs. Nicole considered these engagements from a slightly different lens when she highlighted strategic value in terms of the quality of these engagements. In particular, she explained how the diversity of engagements led her and the CoP toward deeper and relevant learning:

> I really felt that the different engagement opportunities we had helped us have some valuable, critical discussions. From the concept mapping discussions to the invited experts… all of it allowed us to go deeper into what our role is in SRC support. (Nicole, Strategic Value)

Thus, not only was the progressive approach to the meetings of value, but the way the MPCs were engaged throughout the process also proved valuable. Conceptually, the strategic diversity of these learning opportunities (e.g., presentations, concept mapping exercises, case study critiques) also extended into discussions on diverse approaches to SRC support. As one MPC explained, conversations that broadened the lens through which the SRC experience can be analyzed demonstrated an opportunity to re-evaluate current practice models:

> I was surprised to hear that there isn't more research on the success of "return to sport" from a performance perspective. It would be interesting to know more about the success rates of those outcomes. I also found it interesting to consider how factors such as racism, sexism, and homophobia might impact athletes' movement through the stages of return to sport and their willingness to reach out or access resources during those stages. It adds a further layer to a situation in which athletes may already be hiding symptoms due to a fear of being seen as weak (I've heard of teammates doing this in [this sport]), or getting cut from a team. A very thought-provoking presentation. (Hayden, Orienting Value)

Thus, the approach of seeking opportunities outside MPC areas of expertise was appreciated and seemed to orient the group towards thinking critically about the strategies in place, for example.

Advancing Applied Practice

Through the discussion of case studies and engagements with external experts, the CoP critically considered how the MPC's practice could be improved in relation to SRC support,

what some of the challenges to service delivery are, and how MPCs can work with other stakeholders. Collectively, these discussions contributed to another theme: advancing applied practice. One value that is particularly relevant to advancing practice is transformative value. Four generated codes corresponded to this value, particularly representing shifts in mindset or identities. A good example of this transformative shift comes from Patrick, who explained:

> I wanted to take part to further upskill myself. I found the sessions changing my motivations for participating, instead instilling in me a desire to give back to the literature and create more resources for MPCs navigating the field and looking for more information or guidelines on SRCs. (Transformative Value)

As presented in this reflection, initial motivations for Patrick's personal development efforts and other initial reasons for participation transformed into aspirations to see the field at large develop. Interestingly, this is something that was shared by other MPCs in the group. Eric provides another example of this in his discussion after the second external expert workshop:

> The second workshop provided further clarity of my interest/desire to be part of this community of practice. Specifically, the discussions highlighted the lack of consensus and information (possibly even knowledge) that exists around what our role as MPCs is when working with concussed athletes. For me it sparked reflections around what is my role? Who should I be working with as part of the multi-disciplinary team providing support/care for the athlete, and what does that pathway look like currently and what should it look like ideally? I came up with more questions than answers, but the focus was on gaining more understanding of the range of strategies that MPCs currently use/can use to support concussed athletes, and what our role is in the care pathway. (Transformative Value)

Ultimately, these changes in perspectives, reasons for participation, and goals of clarifying the role of MPCs within the SRC landscape were discussed in the form of examples of transformative value, and helped lead the group along in our collective learning journey.

Practical Value for Professional Development and Lifelong Learning

Positive value was identified in the reflections of MPCs across all eight of the cycles of the VCF. These values were broken down into three themes: ongoing learning (immediate, potential, applied, and realized values), contributors to a successful CoP (strategic, enabling, and orienting values), and advancing applied practice (transformative value). The values identified across these themes appear particularly relevant for professional development in the field of mental performance and illustrate the importance of intradisciplinary collaboration.

Cumulatively, the CoP offered a space for MPCs to share resources (e.g., apps, education platforms, books) that they use in their practice. CoP participation also supported engagement in current research. As Iliza mentioned, SRC research is a prevalent topic, so staying current with advances in protocols and support mechanisms is challenging. A recent narrative review highlighted the challenge of this, reporting that 6,130 peer-reviewed articles were published on SRC between January 1, 2010 and December 19, 2019, with a significant amount of these publications dedicated toward treatment and rehabilitation, with several specifically targeting mental health and other related areas (Eagle et al., 2020). Many of the MPCs in our study, like Jennifer, noted that this continual challenge of staying up to date is one that can be addressed through ongoing learning partnerships and deliberate conversations about current research.

MPCs, like other professionals, are urged to act professionally, demonstrate a high degree of competence, and leverage valid and reliable scientific research in their delivery of services (AASP, n.d.). While not limited to SRC, continually pursuing professional development and

staying abreast to evolutions in applied sport psychology is a necessary undertaking for MPCs and the field as a whole (Sly et al., 2020). The mass of literature on SRC alone demonstrates the significance of this challenge, while representing just one of many possible areas that an MPC might be asked to address. MPCs in our study experienced positive value with regards to ongoing learning through peer-consultations on practical setting applications, for example. The discussion of client case studies and engagements with external experts helped the CoP critically consider how practice could be improved, what some of the challenges are, and how we can work with other stakeholders. As both Nicole and Eric indicated, engagement in the CoP allowed them to widen their perspectives of SRC support, identify boundaries of competence, and understand opportunities for interdisciplinary engagement. In addition, recent research in sport psychology has demonstrated the importance of intradisciplinary collaboration in sustaining professional identity, along with expertise (Quartiroli et al., 2022). Thus, having intradisciplinary opportunities like the learning partnership demonstrated within this CoP may be an effective strategy for supporting identity, as well as individual and collective lifelong learning in the mental performance field. While CoPs and other social learning spaces have demonstrated such benefits in the past in other sport fields (e.g., coaching, leadership; Culver & Duarte, 2022; Kraft & Culver, 2021), they are currently being under-utilized in the mental performance profession and other fields of psychology.

The VCF analysis also clarified structural and experiential aspects of the CoP which facilitated learning. While a fewer number of codes were organized within the enabling, strategic, and orienting value cycles, these experiences, like those highlighted by Madison, Nicole, and Hayden, arguably demonstrate why we were successful in our collective learning journey. One aspect which appeared to contribute to this success was the incorporation of diverse

learning opportunities. For example, Nicole brought up the value of engaging in concept mapping exercises and critical discussions in facilitating her learning experience. This CoP had structure in that the objectives of learning were approached differently based on the goal of each meeting. For some meetings, external experts were invited to share their research or practical experiences in their respective fields. These experts were sought out based on their specific knowledge areas, which corresponded to a knowledge gap we identified in our collective knowledge as MPCs. Other meetings involved identifying these gaps and developing a plan through concept mapping whereby other tools, goals, and action points could be pursued through other forms of knowledge sharing. For example, resources, case studies, and presentations were shared during different meetings and through the online learning platform (i.e., Basecamp) to consider aspects of service delivery from different angles. For Madison, it was this progressive approach to learning and the coherency of information from one meeting to the next that helped maintain her engagement and enhance her learning. For Hayden, the diversity of approaches led to a broadening of perspective of the challenge at hand, identifying gaps in research, factors in the psychosocial and cultural experience of SRC, as well as considerations for service delivery. Collectively, these reflections draw attention to aspects which facilitated the smooth operation of the CoP, promoted internal proactivity, and ultimately represent some functional components which fostered and supported learning (E. Wenger-Trayner & Wenger-Trayner, 2021).

According to research on social learning spaces, successful advancements in learning are often partially accredited to the spaces' ability to engage members in experiential learning, increase opportunities to interact and engage in and outside of the physical space, and create an environment that is respectful, providing a place for members to have critical conversations (Duarte et al., 2021; E. Wenger-Trayner & Wenger-Trayner, 2021). Interestingly, identifying the

value of support structures and facilitators of learning is often difficult as the more successful learning spaces are at enabling value, the less obvious the structures and facilitators tend to be. According to E. Wenger-Trayner and Wenger-Trayner (2021), this is "because good design enables social learning rather than directs it" and as a result, "its value risks going unrecognized" (p. 100). As such, while fewer codes were related to successful contributors to the CoP (i.e.,13 across these value cycles, versus 111 in the first four), these examples of structural and facilitative aspects of the CoP are often rare to identify, but illustrate the importance of the structure of this CoP. In support of this, Madison's reference to the flow of the CoP and how the linking of previous conversations and activities with subsequent ones advanced learning is, in the theory, a learning loop. Learning loops are value flows, and paying attention to these and 'becoming adept at designing activities and creating conditions for loops is a key skill for facilitating social learning" (E. Wenger-Trayner & Wenger-Trayner, 2021, p. 133).

Reflection opportunities within and outside of CoP meetings also seemed to fuel both individual MPC's and the CoP's collective learning. According to Moon (1999; 2004), reflection can enhance practice development. Hayden's reflection on one of the external expert's presentations highlights this value by indicating how the presentation allowed her to consider aspects contributing to the psychosocial experience of SRC that may not have been central to her consulting strategy previously. MPCs have been reported as using reflection as a tool in their own early-career development (Kraft et al., 2021), in their delivery of mental performance training (Cropley et al., 2007), and in supporting and evaluating their own overall effectiveness (Poczwardowski et al., 1998). Thus, the combination of reflections (e.g., group discussions after expert presentations, personal value narratives), along with diverse learning opportunities (e.g., concept mapping exercises, case studies) together appear to have been instrumental to facilitating

value for the MPCs. Wenger and colleagues (2002) similarly identified this opening of dialogue between inside and outside perspectives as a principal design element for cultivating CoPs; particularly in sharpening strategic plans, rethinking the structure and scope of CoP reach, and for catalyzing change. As such, leveraging members' ongoing curiosity, diversity in perspectives and experiences, as well as fostering critical engagement with relevant research and learning activities may be valuable for those seeking to create their own mental performance CoPs.

Beyond internal learning, reflections on the CoP also demonstrated instances of transformative value, particularly with regards to advancing professional practice within the mental performance field. The collective learning journey shared by the MPCs within the CoP enabled members to experience shifts in goals, from personal and professional practice to broader knowledge translation, as discussed by both Patrick and Eric. Ultimately, discussions within the CoP revealed a broader challenge for the MPC community: What is the role of the MPC in SRC support and rehabilitation? This question prompted some members of the CoP to commit to additional collaboration to continue this learning journey. Specifically, four additional meetings were held where a number of collaborative documents were developed and conversations took place to work towards clarifying the MPC's role. This continued commitment to collaboration and knowledge translation ultimately led to the production of an applied article to share our collective learning of the MPC's role with the broader community, in the hopes of providing clarity regarding this question ([masked for review]). Though only four codes corresponded to transformational value in the CoP, the existence of these examples is highly significant as they go beyond individual learning and work toward greater change. Often, transformational value is unseen or takes significant time to become apparent (E. Wenger-Trayner & Wenger-Trayner, 2021). As such, the transformational values that did come out of

this CoP, again, demonstrate the potential impact that social learning spaces can have on advancing mental performance service delivery.

Concluding Thoughts

Considering recent calls for diversified professional development opportunities to support lifelong learning efforts in sport psychology (Quartiroli et al., 2021), this paper aimed to highlight the value of a formal CoP for MPCs to support their ongoing learning and advance professional practice. Given the rarity of CoPs for MPCs and the complex SRC niche area of practice, this represented a novel learning and knowledge translation opportunity. The VCF enabled a unique exploration of the benefit of this innovative CoP to participants and the field in general through the identification of positive value in all eight cycles. Specifically, the MPCs acknowledged the benefits of a CoP for staying abreast of the fast-paced changes in SRC management, and for having access to diverse engagement opportunities for development. With that said, this study is not without its limitations. Although multiple points of data were collected, the program took place over a 4-month period. A longitudinal approach may yield additional findings related to the implications of the MPC's practice development, and the subsequent impact of this practice on their athletes' experiences of SRCs. In terms of future considerations, research with a more diverse group of practitioners may be insightful; E. Wenger-Trayner and Wenger-Trayners' (2017) work has suggested that there are fertile grounds between the boundaries of CoPs. Thus, including other practitioners in subsequent CoP meetings may enable further learning and co-creation of innovative practices for supporting elite athletes experiencing SRC. Practically speaking, this CoP took place during the early phases of the COVID-19 pandemic; as many elite sport engagements were suspended and concussions were therefore not occurring as a result of sport participation, opportunities to leverage the learning

253 that took place in the CoP were few. This may have affected MPCs' experiences of value created
254 beyond the immediate and potential value cycle. Future research on social learning spaces for
255 professional development could consider a longitudinal approach whereby data on the impact of
256 practice and practitioners' experiences of integrating that knowledge could be explored. For
257 those considering formalizing CoPs as continuing education opportunities or leveraging these
258 social learning spaces more informally to support lifelong learning efforts, creating opportunities
259 to reflect on the applications of new knowledge could also be of benefit, and being sure to
260 provide leaders with sufficient understanding of the social learning approach. Finally, to our
261 knowledge, the use of CoPs in the MPC community remains limited; it is our hope that this
262 research may inspire others to continue making use of social learning to enable ongoing growth
263 and facilitate lifelong learning opportunities in sport, mental performance, and other disciplines
264 of psychology. Although this paper specifically followed the experiences of MPCs, the focus of
265 their practice is to support psychological well-being and recovery, thus, these findings may be
266 transferable to other practitioners with similar professional goals in other disciplines of
267 psychology.

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Additional Results

Beyond the results reported within the four articles, athletes and MPCs across the three phases of research shared their perspectives on the PSTP developed by Seguin and Durand-Bush (2019). Specifically, after being given a verbal synopsis of the program, athletes in Phase A were asked if they believed the PSTP would have been beneficial to them during their own recoveries (see Appendix C). MPCs in Phase B were given a similar synopsis, asked about the theoretical appropriateness of the tool for MPCs, and if they thought it would be beneficial to athletes based on their consulting experiences (see Appendix G). Prior to the final CoP meeting, MPCs in Phase C were given the entire chapter containing the PSTP to read. During the meeting, MPCs were asked the same questions from Phase B in order to get their opinion on the PSTP within the context of the learning that took place over the CoP's entirety. As with the rest of the data from this project (with the exception of the thematic narrative analysis used in Article 1), the data generated from these questions were transcribed verbatim and thematically analyzed using Braun and colleagues' (2016) six steps (see Appendix D). Two overarching themes were generated when the athlete and MPC co-researcher data was analyzed: liked program components and phase-specific considerations to add or modify. These two themes are discussed below; for simplicity, the same pseudonyms used in the presentation of the results of Articles 2 (i.e., Phase A Athlete Co-Researcher & Phase B MPC Co-Researcher pseudonyms) and 4 (i.e., Phase C MPC Co-Researcher pseudonyms) are maintained in this section. Table 1 collectively presents these for ease of navigation.

Liked Program Components

Generally speaking, the athlete and MPC co-researchers across all phases provided feedback supporting the use of the PSTP as a psychosocial tool during concussion management.

Table 1.

Co-Researcher Pseudonyms

Athlete Co-Researchers		**MPC Co-Researchers**			
Athlete Pseudonym	Research Phase	MPC Pseudonym	Research Phase	MPC Pseudonym	Research Phase
Aiden	Phase A	Andrea	Phase B	Eric	Phase C
Brandon	Phase A	Beth	Phase B	Hayden	Phase C
Derek	Phase A	Frank	Phase B	Iliza	Phase C
Evan	Phase A	Georgia	Phase B	Jennifer	Phase C
James	Phase A	Heather	Phase B	Madison	Phase C
Karen	Phase A	Isabelle	Phase B	Nicole	Phase C
Lennox	Phase A	Joey	Phase B	Patrick	Phase C
Rose	Phase A	Mike	Phase B		
Tanya	Phase A	Rachel	Phase B		
Zach	Phase A				

Note. Comprehensive presentation of pseudonyms across research phases. Pseudonyms for athlete co-researchers are those used within Article 2. Pseudonyms for MPC co-researchers are those depicted in Article 2 (Phase B) and Article 4 (Phase C). As some MPCs from Phase B participated in Phase C, a different pseudonym was provided for these MPCs to protect their anonymity.

As Rose (athlete) explained, the PSTP had potential as a powerful resource during rehabilitation:

> Being an athlete, it's always nice to have guidance, and if you have things that you can do and goals you can achieve that show you you're getting better, I think that that's super

helpful. And everything that you listed would help you thrive and get better, probably faster.

Aiden (athlete) had a comparable perspective, indicating that he wished he had access to it during his own recovery: “it sucks that I didn’t get to get it when I was going through my concussion!” Similarly, Brandon (athlete) explained: “with the program, it seems like there are distinct goals and ways to help. That to me sounds like a great thing to be able to offer to athletes with concussions for sure!” Each athlete co-researcher provided similar feedback, but as one highlights, an important aspect about the program is that it be catered to the individual athlete because not every strategy is going to benefit every athlete: “I don’t know if all those things would have worked for me, but I can definitely think of a few that would have; like the imagery and self-regulation I think would have been really helpful” (Karen, athlete). As such, the breadth and catered individualization of strategies was noted as an important and desired structure: “I really like how it’s athlete-centered” (Tanya, athlete).

The perceived value of this athlete-centered approach is also reflected in the diversity of preferred program components. Three athletes highlighted self-regulation as one of the aspects of the program they believed would have helped them the most (i.e., for monitoring, adjusting, demonstrating, and evaluating progress); four highlighted goal-setting and goal-management (i.e., for establishing structure and creating congruence with an elite athletic mindset), four relaxation (i.e., for easing physiological and psychological symptoms of activation), and three imagery (i.e., for healing and preparedness in returning to sport). Overall, athlete co-researchers shared the perspective that the PSTP holds a lot of potential: “I think even if it reaches one out of 20 athletes, it’s going to help a good portion of the athletic population because there would be so much power in that” (Derek, athlete).

MPC co-researchers also tended to view the PSTP as a valuable, yet adaptable resource they could cater towards their athletes. For example, “I like the focus on sort of those basic pillars of well-being; I think that makes a lot of sense. I like the fact that it gives the athlete something to do in a period of time where they are largely unable to do much” (Joey, MPC). With regards to specific program components, MPC co-researchers appreciated the overarching emphasis on self-regulation as a guiding framework. One MPC highlighted that this approach is particularly useful in exploring the narrative an athlete has around their concussion:

> I think it can help get into the deeper meaning that often isn’t at the surface; something you need to uncover. Like, ‘What’s the story behind this?’, ‘What does this mean to you?’ Or, ‘What is the story that you’re telling yourself about this?’ As opposed to just ‘I have a headache today and I’m really bummed out about it’. The surface-level clearly makes sense, but that inner narrative is usually informed by your biography and underlying assumptions. And until you ask those types of questions, I think it’s harder to know the true subjective experience of the athlete. (Nicole, MPC)

It appears that the self-regulatory approach utilized across the PSTP may then be an insightful tool for creating awareness for the athlete. Further, it could provide understanding of the interactional effects of different aspects of biography and experience that influence the concussion recovery trajectory.

Goal-setting and goal-management was viewed as an effective strategy for normalizing the experience, creating structure, and enabling flexibility. For example, one co-researcher focused on the elastic and self-acceptance aspects of goal-setting:

> I like that concept of elastic goals; [...] that idea of an acceptable achievement zone. So if they're trying to set goals around recovery each day, each week, et cetera, [...] elastic

> goals make it a little bit less 'all or nothing' and give them a chance to feel success within a bandwidth of acceptability; basically so that if they regress slightly, they might still catch that bottom end of their elastic window of goal setting. And if they don't, you've also got that goal of self-acceptance, which I think combining those two things is interesting and also really helpful. (Hayden, MPC)

As Madison (MPC) continued: "we're in charge of helping them understand and see progress with their goals, so keeping track to show progress and help build confidence is a critical part of this program".

Some feedback centered around the relaxation and imagery portions of the PSTP, particularly for symptom management and experiencing a sense of control during rehabilitation. For Georgia (MPC), the relaxation portion of the program made a lot of sense, expressing that:

> The relaxation component is huge, just because of the anxiety linked to concussions, right? They're often doubting whether they'll ever get back to their sport, so that creates a lot of anxiety. So that relaxation piece is critical, and also the piece to help them fall asleep, because we know that the sleep patterns are totally disrupted when we have concussions.

Ultimately, the program as a whole was viewed as a useful resource, one that could assist MPCs in the delivery of support during concussion recovery. As Hayden (MPC) explained: "I definitely will refer back to this chapter and any further iterations if I come into working with an athlete with a concussion again; it was really helpful".

Phase-Specific Modifications and Considerations

Co-researchers also shared their perspectives on components of the program that could be added or modified. These perspectives are presented based on the section of the PSTP they

correspond most with, and based on the doctoral candidate's interpretation of the data. In some cases, the additions or modifications may apply to multiple components of the PSTP. In these circumstances, the section of the PSTP where that suggestion appeared most aligned and/or significant was the deciding organizational factor (e.g., a modification appropriate across three skills but most important within goal-setting is presented within the goal-setting subsection). Furthermore, the PSTP was originally designed to be individualized to the unique contextual demands and experience of the athlete; as such, the additions and modifications presented below should be understood as methods of broadening and/or catering to the athlete's particular needs.

Intake

Social Support. Co-researchers collectively shared the perspective that social support is integral to the concussion experience, and should be considered within the PSTP. For James (athlete): "I think it is important for you to have support; someone to have conversations with and who will actually listen to you and understand". Tanya (athlete) indicated that this support might take the form of providing accountability to follow a schedule and her concussion protocol. Derek (athlete) suggested that this might involve an ex-player network: "maybe like older players that have had similar experiences to open up to [...], or doing it more like a support group to at least chat". The origin and form of social support available and desired might be varied. Regardless, athletes expressed that having an MPC to serve some of these functions or facilitate social support opportunities could help the rehabilitation process. MPCs suggested, because social relationships and support appeared so critical for the athletes they worked with, that a check-in should be done during the intake to identify members of their support system.

> Eric (MPC): There is a psychosocial element to this. It's important to touch base a bit to know about the support network. What is their entourage like? That actual entourage needs to come in somewhere.
>
> Madison (MPC): Yeah. Maybe it's the support and love of your family and friends, or of your teammates. Exploring their network of support early seems important. Maybe it's having them talk to somebody else who's had a concussion, [...] or going along the recovery timeline with somebody. So an intake could include that as well.

While the MPC and concussion management team are focused on the athlete directly, consideration for the impact of the injury on social relationships and establishing who is within their support network appears to be an important step. "And if they just don't have a support system, or if those around don't understand how to help, we should establish something, especially in the beginning stages" (Rachel, MPC).

Psychoeducation. One of the components MPC co-researchers in Phase C recommended be part of the intake process, as well as throughout the program in general, was psychoeducation to normalize the concussion experience:

> I think maybe we need to add the emphasis on normalizing the process for them. Because in our discussions, we've been talking about that being such an important piece. And right off the bat, that's what they need to hear, right? That this *is* normal. And I think it's so important that it needs to be part of step one. (Iliza, MPC)

Other MPC co-researchers continued this discussion, suggesting that this psychoeducation include conversations around symptoms, expectations, and beliefs about concussion.

> Eric (MPC): Yeah, the psychoeducation part is significant, isn't it? 'It's OK to feel like this. These symptoms, they're part of the injury'.

Jennifer (MPC): I think it's similar to finding out what their beliefs are about concussions, right? Everybody has certain beliefs, like 'this is what I've heard.' So finding out what their self-limiting beliefs are to a certain extent, really is important to that intake process.

Eric (MPC): Then it's also managing expectations, isn't it? It's understanding 'What is your expectation of where you're at?', 'Where are you?', 'Where are you going to be with this?' And then that psychoeducation comes in. If they have unrealistic expectations or they don't understand the impact the injury will have or could have.

From this lens, the information relayed through that psychoeducation would then be dependent on the athlete's unique experience, with the central goal of normalizing their experience.

Athlete co-researchers also often discussed the role of normalization, as illustrated in Article 2. For them, they felt that normalizing the experience should also involve the incorporation of education and actionable strategies within the PSTP. Athlete co-researchers from one focus group shared the following:

Lennox (athlete): I think someone who is knowledgeable in concussions would help as well, again, to normalize what you're going through, and to have some strategies for you so you're not just lying in bed doing nothing, driving yourself crazy.

James (athlete): Yeah, I think that it would have been nice to have a list of things you could do post-concussion. It would have been nice to have a piece of paper that had a list of 10 or 20 things on there, that 'here are some suggestions for what you could do to occupy your time'.

Lennox (athlete): So I one hundred percent agree with that. Like, 'it's OK to have a shitty day. Here are 20 things that you could do.' And maybe some of those 20 things don't

> work for you. But that's where self-regulation comes in. I think that would be huge. And that might not be something that everyone can do, or that everyone knows how to do. So from that, it would be a list of things you could do, like James said, but also somebody to guide you through those activities and the self-regulation of them.

Generally, athlete and MPC co-researchers seemed to view the normalization of experience and accompanying education and action tools to be a critical early step. Psychoeducation during the intake phase was suggested as a tool to normalize aspects of the experience and help the athlete shift toward an increasingly autonomous lens versus one in which they perceive a lack of control.

Self-Regulation

As illustrated above and as designed in the original PSTP (Seguin & Durand-Bush, 2019), self-regulation is part of the intake process, and the behaviours that support self-awareness, self-monitoring, and the act of self-regulating involve psychoeducation and guided strategies to be implemented effectively. It is presented as a distinct section for consideration here, as it is the central guiding framework for the entire program. As some MPCs in Phase B pointed out, this self-regulation component can be expanded to the team, or shared within the team's culture to support positive behaviours:

> Isabelle (MPC); It's almost like, 'here's a plan, this is what we need to do for the next little while'. Then, it's a little bit better than, 'OK, let's just monitor and see'.
>
> Mike (MPC): Yeah, so the more there is structure and the more mental skills are integrated into existing routines and existing cultures or norms, that's useful. [...] And then it becomes part of the furniture, and then it becomes the norm for a concussed

> athlete to self-monitor and self-regulate, because that's part of what they're expected to do.

The structuring and integration of that self-regulatory culture around concussion may span beyond the role of the PSTP, but the normalization of self-regulation as part of the recovery process is an important approach.

One athlete co-researcher mentioned that part of the self-regulation process may involve the fostering of a positive mindset: "Also, if there's some way of incorporating positive thinking [...]. Like, positive things happen to positive-thinking people" (Derek, athlete). Positive self-talk or navigating athlete's narratives may be an important addition to the PSTP as many athletes discussed getting upset (e.g., Brandon, Derek), depressed (e.g., James), feeling different or isolated (e.g., Lennox, Evan, Zach), irrational (e.g., Karen, Aiden), or moody (e.g., Rose, Tanya). MPC co-researchers in Phase C indicated that moving towards this positive mindset requires an understanding of how athletes are constructing their narratives around concussions (e.g., Jennifer and Eric's conversation above). Madison (MPC) suggested that throughout this process: "it might be good to start asking resilience-based questions or strength-based questions", as they promote ownership and resourcefulness. One MPC co-researcher viewed this as movement away from black and white thinking and towards a growth mindset:

> There's a really good parallel with sport itself. We aim to win every week. We aim to get a gold medal. But we don't always get one. And we have to be realistic about that and we have to take the positives from when we didn't win; what we did actually achieve and then move forward with that. So I think that's a really nice target for the athletes. (Eric, MPC)

Goal-Setting & Goal-Management

The positive mindset discussed above was also articulated as an important element of the goal-setting and goal-management phase. Across the focus groups and CoP discussions, as mentioned briefly above, having realistic expectations and assessments of where the athlete is, needs to be part of the education process. Realistic appraisals should be emphasized from day one and maintained throughout recovery. MPCs in Phases B and C recommended having the SMARTER acronym for goal-setting as an option for promoting this:

> My thought is like, because goals are hard at this stage, it's not like 'I'm going to be back tomorrow'. It's not realistic, so you could explain what's real or not, and what's realistic and what's not realistic, and how to monitor. And then have SMARTER with the 'R', which is 're-evaluate'. So 'where am I compared to where I wanted to be?' You know, maybe acknowledge what's actually happening; some compassion in those situations. And then kind of make something new, because otherwise you're just there and you just wait. (Beth, MPC)

Another MPC suggested a similar perspective, highlighting how the 'R' of SMARTER may help with framing a positive mindset around recovery:

> I know you have SMARTEST, but for me, I use SMARTER. The 'R' is the 'revisit', so that's just revisiting the goals. You might set a goal and never get there. It goes with our waves, it goes with our cycles, it goes with everything. And the fact that we didn't meet this goal in this time frame doesn't mean you've failed. It just means we need to revisit and readjust. So I think goal-setting is key for me in helping track progress, but almost emphasizing from day one that we don't actually know how things are going to go, so just being realistic. (Madison, MPC)

Relaxation

With regards to relaxation, MPCs and athletes generally agreed with the format and approach. The only additional consideration was leveraging some symptom-monitoring strategies prior to and after engaging in a relaxation exercise:

> I think there's value in just a quick check-in on symptoms before doing an active or passive muscle relaxation exercise together, and then having them check in on it again right afterwards, trying to see if they can do something that helps manage symptoms, even for a brief amount of time. I've noticed some success with that. That feeling of helplessness and not being able to do anything that'll actually help with progress; they can actually start owning a little bit of something that might be able to give them some sense of progress in getting better, however small. (Patrick, MPC)

MPCs indicated that a Likert or colour scale might be beneficial at this phase: "maybe we've got a bunch of different ways to track them. So the scales, the moods, the happy faces, whatever. And then we let them pick what works for them" (Iliza, MPC). While not only relevant to the relaxation phase of the program, simpler symptom-tracking mechanisms were considered potentially valuable mechanisms for tracking progress, changes in symptom-states, and for measuring the effect of an intervention like a progressive muscle relaxation exercise. One athlete tracked her symptoms in such a way and indicated that it had value for her:

> I would fill it out every day and then I'd write notes to myself to know how I was progressing and what my symptoms were, so I could keep track and see if I was getting better. I think, for athletes especially, knowing you're getting better rather than guessing is important. (Rose, athlete)

Imagery

Likewise, the imagery activities in the original PSTP were perceived as beneficial. The only additional consideration regarding this aspect of the program was to incorporate imagery during the return-to-sport process, depending on the athlete's skill:

> I just want to add, not necessarily that it's lacking, and it's very possible it's already applied in this way, but I see imagery not just productive for healing aspects. I think that the imagery component would be really important during return to play. The amount of times I've come across an athlete that says: 'I can't stop replaying [the hit] in my head. I just keep seeing the injury over and over again'. And that actually causes their stress levels to go up. So there's both an opportunity to imagine yourself modifying the imagery *and* imagine regulating yourself. I think there's an opportunity there that you can also start using that imagery to accept what happened and try and alter it to see if you can exercise a little bit of influence over it. 'Just because I'm going to go up for a lay-again in the paint, doesn't mean that I'll get somebody's elbow in the temple'. Asking 'can you see it happen differently in your mind?' I think there's an opportunity there to work on an athlete's confidence during return to play with that imagery piece. (Frank, MPC)

Other MPC co-researchers shared this perspective, highlighting the opportunity to use imagery for healing, to help re-story the athlete's narrative around the injury, and to help restore confidence when returning to play.

Rose (athlete) applied imagery in this way and saw a benefit to it: "I would use it when I was concussed because I wasn't able to actually do my sport. I think that probably helped me." One caution an MPC indicated though is that the application of this skill, as with any other in the program, is dependent on the athlete's experience: "I guess it really depends because everyone's

imagery ability is quite different (Rachel, MPC). With this in mind, it was suggested that MPCs adjust scripts and have several in their repertoire to adjust according to the athlete's imagery abilities, symptoms, and expertise: "So having a whole library to choose from, and ensure that they steer clear of images that trigger symptoms, or have extra description for those who are less experienced" (Heather, MPC).

PSTP Conclusions

Together, the input from the co-researchers on liked program components and suggestions for additions and modifications to the PSTP indicate a positive perception of the program's usefulness, applicability, and next steps. Along with the results from Articles 1-4, these additional results will be integrated into the remaining chapters of this dissertation and will be focused on within the chapter entitled Practical Implications and Future Applied Directions.

Reflections from Reflective Journaling

Throughout this project, I completed 21 research journals that followed Moon's (1999) reflective journaling process (see Figure 3), as well as 30 informal reflections throughout the research (i.e., phone note entries, journaling in notebooks I had in hand). I have selected excerpts from these formal and informal journals to share, specifically with the intent of highlighting three overarching themes I noticed in re-reading them: appreciation for our learning journey, my experience of facilitating participatory research, and inspirational moments towards challenging the status quo. I've included some commentary in each of the sections to situate these reflections.

Appreciation for our Learning Journey

The first theme that stood out to me in re-reading my formal and informal journal entries was a regular appreciation for the learning journey. Whether it was enjoyment or excitement at the prospect of starting, learning through the different data collection activities, or the work I did on this thesis, I consistently highlighted an appreciation for challenges, the value of the learning experiences, and the overall research process.

Excerpt from Informal Journal Entry 2 (8 June 2019 – Post Proposal Defence):

"Leaving my proposal the other day, I realized something. I was nervous going into it, but confident at the same time. And now my confidence and excitement towards starting the process are getting more and more amplified. My committee indicated that my project is ambitious, but I have never been one to back away from a challenge. I look forward to learning more about participatory research and giving it a try, even if it does seem like a giant beast at this point."

Excerpt from Research Journal 11 (28 February 2019 – Data Analysis Phase):

"I have really enjoyed the coding experience so far. It's great to engage in the data in this way as I feel it's starting to shed greater light on the importance of this topic. I feel as though I am also

learning new things each time I go through the transcripts and by engaging with the transcripts so thoroughly, I am gathering a great deal of depth and information that will really benefit the community of practice, once we start at the end of March, as well as the research as a whole. I also believe this committed depth of engagement will make me a better researcher over time."

Excerpt from Research Journal 12 (3 March 2020 – Post Engaging Critical Friends): "Largely, I think one of the goals of reaching out to these experts from different areas of injury and concussion is to help provoke discussion in the community, while also helping everyone engage with uncertainty (E. Wenger-Trayner & Wenger-Trayner, 2021). As this is a topic that is challenging across the board and we all may have different ideas of how to work with concussed athletes, there are a lot of considerations from different specialties and lines of thinking that I think would greatly impact the learning that can potentially take place within this community of practice. I hope that providing these different perspectives in contrast to the medical-dominant model that most MPCs have referred to in their consideration of concussions will help inspire critical thinking and innovative strategies that we can propose for supporting athletes psychosocially in the future, as well as potential avenues for future research, and education opportunities. I can't get over how much value these engagements have added already."

Excerpt from Research Journal Entry 21 (15 July 2020 – Post Last CoP Meeting): "As this was our final meeting, I also thanked everyone for their participation, contribution, time, and overall engagement throughout this process. It was a really enjoyable experience and I feel very fortunate to have had the experiences I've had within this community. I was also very happy to hear the positive responses and appreciation the MPCs shared; it was great to hear that the benefits were for everyone and that the experience was enjoyable all around. I think this just

highlights how impactful participatory type research can really be; going beyond traditional methods to actually engage people in experiences to learn together. I'm so grateful."

My Experience of Facilitating Participatory Research

A second important theme from my journals was related to my experience facilitating this intriguing type of research. I discussed challenges related to the flexible nature of participatory methods, lessons learned when my facilitation needed to adapt, and examples of how some processes deliberately or naturally enabled value to co-researchers.

Excerpt from Research Journal Entry 2 (9 December 2019 – Recruitment Phase): "Through this experience, I have noted a few things that have really shaped my understanding of recruitment, which I believe will help me in the next phases of this research. First, trying to coordinate multiple participants at the same time for a focus group has been a challenge. I know going into this, I was very lenient with timing, offering participants the opportunity to choose a date/time within a three-week span. However, giving this flexibility was too much in my opinion, as participants appeared to have wanted more concrete times to schedule. As such, I adjusted my approach during the recruitment process and was more explicit with date offerings. Once an athlete or MPC had offered a time, I extended the time offered to two other participants to see if this would work for them. Luckily, this worked in all cases."

Excerpt from Research Journal Entry 6 (15 December 2019 – Post Athlete Focus Group 3): "I found the dynamic of this focus group was a little different. At times, one of the participants would jump in and start talking while the other participant was mid-sentence. This didn't happen all of the time, but it did happen a handful of times. I think, for the most part, I handled it well in making sure that I returned to the participant who had originally been speaking and reminded her of what she was saying in order to give her the opportunity to speak more.

However, I think in the future, if it happens a couple times where one of the participants just keeps jumping in, I could ask that participant to hold their thought while the other finishes their sentence. Even more proactively, I could say at the beginning of future focus group meetings, as well as within the communities of practice that lie ahead, that we should (as a group) allow each other to finish ideas and stuff before jumping in. This would be part of my preamble (I imagine) or even in a rules of conduct sort of section online for the community of practices. This will be something I should consider moving forward, but recognize it will have to be balanced. The potential of going too structured in this way may then be that the conversations don't flow as naturally. I'm not sure what is best. I will also have to refer to some of the Wenger-Trayner documents as I recall them discussing roles within communities of practice and other social learning spaces that help moderate these discussions and encourage participation from everywhere. These tools will likely be beneficial in the next phases of the research where participation numbers are expected to be larger."

Excerpt from Research Journal Entry 14 (2 April 2020 – Post CoP Meeting 1):

"While I was preparing access to our initial group reflections' document, a discussion broke out about tools that MPCs in our group are using for remote work, given that we are in unprecedented times with respect to Covid-19 shutting down a lot of work around the world. I subsequently created a document (per Dr. Culver's advice) with all of the tools that were noted. I really liked that the discussion was already focused and productive as resources were readily being shared. Also, the community seems very respectful so far. I think having the group of professionals that we have will help with the functionality of the community and will help conversations come up organically. This will be great as I've been asked to lead the group, but

these organic conversations and group-prompted discussions should help mitigate some of the potential power dynamics."

Excerpt from Informal Journal Entry 23 (31 July 2020 – Post CoP Completion): "I was initially concerned that my role as the appointed CoP "leader" could potentially negatively impact the collaboration dynamic we sought with this approach. However, my awareness of this challenge early on, I believe, was very instrumental in enabling value for the CoP. I intentionally incorporated activities, like our concept maps, to help the co-researchers voice their goals and ultimately focus our attention on our collective learning. These regular collaboration activities, I believe, helped foster a safe work space, allowed us to be productive, and ultimately learn together on things that we cared to learn about."

Inspirational Moments Towards Challenging the Status Quo

The final prominent theme I noticed from my journal entries was how moments throughout the research served as significant inspiration towards challenging the status quo of applied work and research in the SRC landscape. Whether it was conversations with co-researchers, lessons learned from the process, or topics that peaked my interest, my journal entries oozed with inspiration, which I absolutely felt again when re-reading them years later. It was through these entries and reflections that I recognized what direction I wanted to go, and what was important to me with regards to our resulting publications and this dissertation.

Excerpt from Research Journal Entry 3 (10 December 2019 – Post MPC Focus Group 1): "I found the entirety of the focus group interview to be stimulating and very interesting. From one perspective, I was incredibly excited to hear that my thoughts and feelings about psychosocial concussion support were echoed by both MPCs. For one, based on their sharing, it appears that collaboration between the members of an athlete's support team

(whomever that may include) is a key element to concussion support. That being said, that communication is not always easy, and the mechanisms of that communication differ significantly between teams, organizations, and sports. The MPCs took this further and suggested that the culture of the organization around the athlete may be in need of a wake-up call as the treatment and support of athletes is not always fair, or consistent. One of the MPCs discussed how he has tried to check-in with athletes who retire from sport as a result of a concussion and how this was largely his own doing as it was not supported or funded by the organization. While I have heard stories from other athletes and experienced it twice in my own athletic career, it remains a shock to me that athletes who dedicate a large portion of their lives to a sport, team, and organization, that they are often abandoned by the organization as soon as they are no longer able to participate on the field of play. [...]

"This thought triggered an idea in me after the focus group, with regard to communities of practice and athletic identity. E. Wenger-Trayner and his colleagues have often discussed a process of *becoming* within a community, in which those on the periphery of a community gradually work their way toward more central roles. Now if we consider an athlete as a central member of a team, for example, when they become concussed, their role within that community changes. It's as though their role suddenly shifts and their interactions with members in that community become unfamiliar. This is where we tend to see the first instances of a concussed athlete's experience of isolation. So now we have two things that can happen: 1) the athlete returns to sport or 2) the athlete abandons the sport (either due to their own decision making or as a result of medical advice). In the first case, the athlete returns, but his or her cognitive structure has changed, in that their relationship with other members of their team, medical staff, etc. was altered, even temporarily. That change may be as simple as becoming more aware of injuries and

support offered to other concussed athletes (for example, an athlete asking how another is doing and checking in from time to time), or it may be more significant in that the athlete may be fearful of re-injury/long-term consequences that extend from physical health to missing significant athletic opportunities, or even changing the way the athlete interacts with others. Regardless though, the athlete works to re-establish him or herself as a core member of the community, even if relationships or dynamics have changed. In the second case though, the athlete is completely removed; as they are no longer competing in sport, the athlete becomes suddenly removed from the community. As they are no longer competing, all of the financial, medical, psychological, etc. support provided by the organization is removed. And, the athlete ends up being cut off from members of the community. While the athlete and the other members of the team and organization may maintain contact in some way, shape, or form, the responsibility to maintain that communication and support becomes an individual's responsibility, and no longer is upheld by the organizational structure. I need to reflect on this and explore these ideas further."

Excerpt from Research Journal Entry 5 (14 December 2019 – Post Athlete Focus Group 2): "This point about silos and professional access brings me back to one of my reflections from the first MPC focus group; the process of coming into sport, training, and rehabbing within sport, particularly from a physical injury perspective, is a guided process with multiple points of support from different specialists and trainers (e.g., dieticians, strength and conditioning coaches, physios, coaches), and it seems that with concussions, that most of this network can easily fade away, and it becomes entirely the responsibility of the athlete or one physio or one doctor to manage recovery. Why is it that with an injury as multifaceted as a concussion that the community surrounding the athlete suddenly disappears? And on the flip

side, the other athlete in the focus group today suggested that he had a lot of people checking in and supporting him and giving him advice, and he was able to recover relatively quickly. While I don't think this is a causational relationship, I have to wonder that if the community sticks with the athlete, will that have a positive impact on his/her recovery?"

Excerpt from Informal Journal Entry 25 (28 August 2021 – Post Leave of Absence):

"In reviewing the CoP meetings and re-familiarizing myself with the value creation stories and personal value narratives, I realized something profound. Throughout our CoP, we made our vulnerabilities, questions, and concerns known, and deliberately sought out experts from elsewhere in the concussion landscape to help inform our role within concussion management. In essence, we went beyond our practical silo to advance our knowledge with the hope of making our work AND the landscape better. So far, I have not seen much in regard to this sort of attempted advancement in the field. Instead, concussion conferences, symposiums, and consensus/position statements have not effectively expanded their boundaries to be inclusive of the diverse approaches that could be united to enhance concussion management, nor do co-operative efforts across disciplines (beyond health care) seem to be prioritized."

General Discussion

This chapter highlights original contributions to the concussion research landscape that derive from the results of this project. The novel approach taken within this research enabled several valuable contributions which were highlighted within the results; this section goes further to capture broader contributions that serve to challenge researchers' understandings of the injury, and our roles and responsibilities to the greater field. To situate this discussion, the purposes and research questions of this research will first be briefly revisited. Subsequently, a discussion on three significant research contributions is presented. The first expands the construct of fear as it pertains to concussions. The second corresponds to challenging the paradigmatic influence of research on protocols and consensus statements. The third focuses on opportunities to leverage the results of this research within concussion protocols and discusses the need for deliberate knowledge translation efforts by the concussion research community.

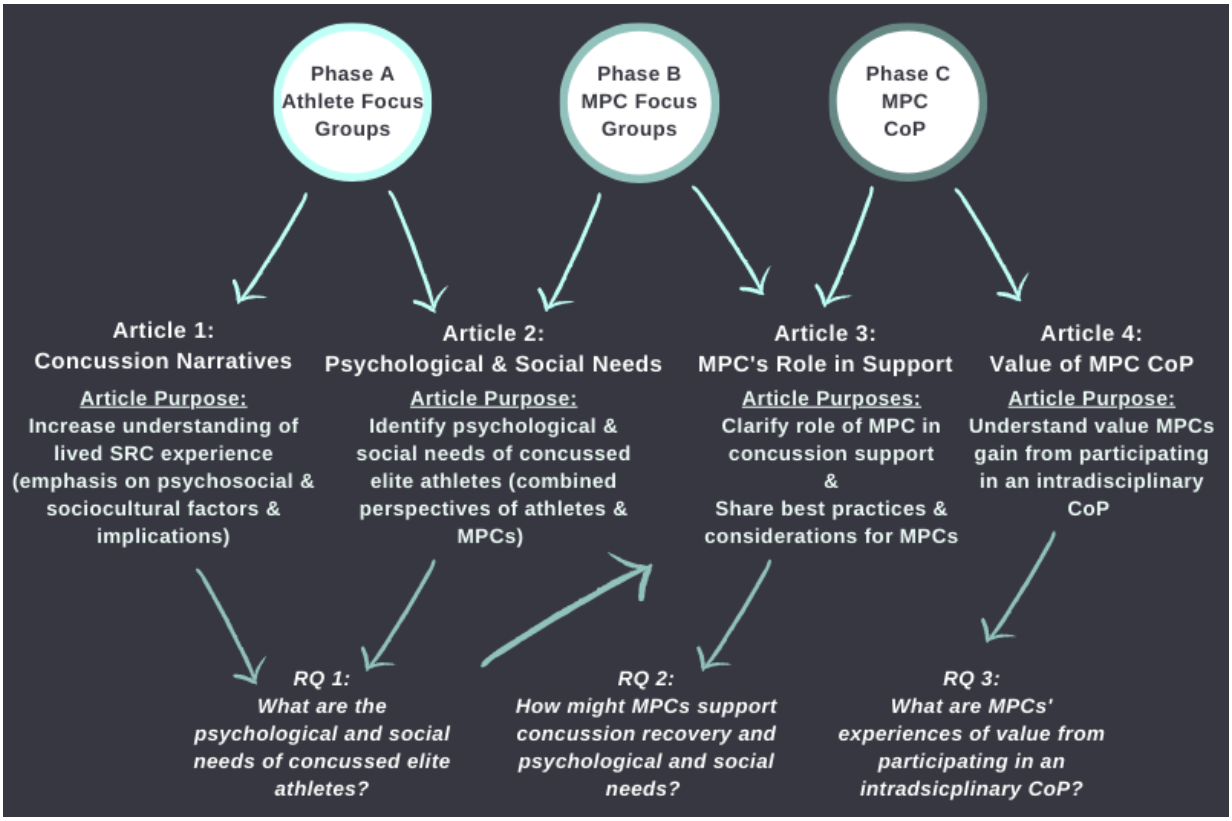
Purposes and Research Questions Revisited

The primary purpose of this research project was to identify psychological and social needs of concussed elite athletes, and mechanisms of supporting those needs. To do so, Research Question 1 (i.e., What are the psychological and social needs of concussed elite athletes?) enabled the exploration of needs through the experiences of the athletes themselves, as well as the perspectives of MPCs who work with concussed elite athletes. Research Question 2 (i.e., How might MPCs support concussion recovery and psychological and social needs?) allowed consideration of support mechanisms by expanding on an existing PSTP (Seguin & Durand-Bush, 2019). The secondary purpose of this project was to explore the value of MPCs' intradisciplinary collaboration in strategizing support mechanisms. Research Question 3 (i.e., What are MPCs' experiences of value from participating in an intradisciplinary CoP?) supported

the exploration of the value of the CoP for the MPCs involved. A collaborative inquiry (Bray et al., 2000) involving three phases was undertaken to explore these purposes and research questions. The bullets below indicate how the data generation and the resulting articles corresponded to each of these research questions. Figure 6 provides a visual representation of how the research phases, articles, and research questions fit together.

Figure 6.

Phases of Research, Articles, and Research Questions



Note. Visual representation of how the three phases of research informed the results of each included article, how each of the articles responded to each of the research questions, and how the data generated in Research Question 1 also informed the creation of Article 3.

Research Question 1

- A collaborative inquiry of elite athletes, involving focus groups and narrative development, explored psychological and social factors of the lived experience of concussed elite athletes (Article 1).
- Focus groups of elite athletes with a history of concussion and MPCs who have worked with concussed elite athletes generated data on psychological and social needs (Article 2).

Research Question 2

- The data generated from Phases A (Athlete focus groups) and B (MPC focus groups) were shared within Phase C (MPC CoP) to support understandings of where MPCs might support concussed elite athletes (Article 3).
- Athlete and MPC co-researchers across Phases A, B, and C provided perspectives on the PSTP developed by Seguin and Durand-Bush (2019; Additional Results; also see Practical Implications and Future Applied Directions chapter).

Research Question 3

- Throughout the MPC CoP, MPCs completed reflective assignments, which supported the exploration of value from the CoP engagement (Article 4).

Contributions to Research

As significant discussion is dedicated to the results of this research within the articles, the three contributions presented below go beyond the article discussions to more broadly consider constructs and the manner in which research is produced and disseminated within the concussion landscape. They also serve to challenge the status quo of the traditional research approach to

concussion and encourage the broadening of the lens from which we do research in the future, as will be seen below.

The term ‘landscape’ draws from a construct within social learning theory. According to E. Wenger-Trayner and Wenger-Trayner (2015), “the ‘body of knowledge’ of a profession is best understood as a ‘landscape of practice’ consisting of a complex system of communities of practice and the boundaries between them” (p. 13). When considering the concussion landscape, this should be understood to include the knowledge and professionals that operate across diverse research disciplines and the researchers exploring SRC; the sport organizations and policy makers; the teams, coaches, staff, and athletes that compete in sport; members of concussion management teams (e.g., sport medicine physicians, athletic therapists, MPCs) and specialized care providers (e.g., neuropsychologists); concussion educators; and those who provide other forms of support to those with concussions (e.g., family, friends, partners). As will be discussed below, significant challenges exist within the concussion landscape at this time, and a deliberate effort to communicate across professional bodies (or boundaries; E. Wenger-Trayner & Wenger-Trayner, 2015) should be a collective effort.

Expanding the Construct of Fear

Within a recent systematic review, van Ierssel and colleagues (2022) articulated that a minimal amount of concussion-specific evidence on psychosocial factors around return-to-sport is currently available. On the basis of the existing evidence available on the topic, the review identified three psychosocial factors that influence return-to-sport and that align with current review research on return-to-sport following orthopedic injury. The first was fear and emotional factors, where fear was considered to be a multidimensional construct, a notion which is consistent with our results. In particular, van Ierssel and colleagues (2022) indicated that fear

could be avoidance-oriented (i.e., kinesiophobia; pain is dangerous and should be avoided) or related to the potential perceived risk of repeated concussions (i.e., a fear of future/recurrent concussions). The data generated from our focus groups with athlete and MPC co-researchers are consistent with these perspectives on fear, whereby experiences from both populations illustrated these types of fears (Article 2). In Article 2, we indicated that these fears need to be considered when returning to sport, and highlighted the importance of efforts to establish and restore confidence during the return-to-sport process in response to these two types of fears. Our CoP, as demonstrated in Article 3, also advocated that MPCs should take these types of fears into consideration and cater their consulting approach accordingly. Collectively, we suggested that MPCs' efforts regarding fear management would largely occur during the rehabilitation and return-to-sport phases through the use of psychological skills (e.g., reframing self-talk) and diversified coping strategies (Article 3).

Beyond what is reported within van Ierssel and colleagues' review, our data suggest that a fear of long-term consequences is another dimension of fear that may be experienced by athletes returning to sport (Article 2). Within Article 2, we discussed how misinformation and the absence of research on several potential long-term consequences (e.g., chronic traumatic encephalopathy; CTE) may contribute to these experiences of fear. According to a recent consensus statement on medical issues for SRCs, further research is needed to understand the pathology, incidence, and prevalence of this neurodegenerative disease. Notably, current scientific evidence does not suggest that a cause-effect relationship exists between multiple concussions and CTE (Herring et al., 2021). However, the translation of this knowledge to the public has not been effectively enacted as this type of causational myth continues to be prominent (Carson, 2017).

From an increasing confidence perspective, deliberate educational efforts to dispel myths and clarify ambiguities that contribute to these fears appear of particular importance. However, these educational efforts are very dependent on the educator's knowledge of concussions and consequences (Articles 2 & 3). Given the pace at which the field is evolving, staying abreast of changes in recommendations and knowledge poses a practical challenge (Article 3). Some additional challenges identified by Kroshus and Chrisman (2019) regarding education include the frequency (i.e., concussion education is typically at one point in a season and forgotten) and resources (e.g., funding, researcher availability) to ensure the education provided is facilitative and reflective of current practices and research. A recent consensus statement regarding athletes and military service members advocated that education should include material related to possible long-term manifestations of these injuries, as well as challenge concussion-related misperceptions (Kroshus et al., 2020). Kroshus and colleagues (2020) explained that this approach to concussion education needs to involve a combination of stakeholders, education sessions, and facilitative interactions (e.g., team and individual discussions) to address these topics. In other words, concussion education of this nature requires several engagements and multiple educated stakeholders to have the greatest chance of being effective and reflective of the current state of knowledge.

The issue of knowledge translation spans beyond educational strategies, however. Those within the research and applied communities have to deliberately work to disseminate knowledge in a publicly accessible manner. The rate at which concussion-related research is being published is significant; between the years 2000 and 2020, the field saw exponential growth in the number of publications (Sharma & Lawrence, 2022). As research continues to be published, creating digestible, accessible formats to facilitate knowledge translation about this advancing research

requires ownership on the part of researchers. This is perhaps one of the reasons consensus statements and other concussion forums (e.g., conferences, online education) have become increasingly common as a method of disseminating information. As will be noted in the section below, however, this approach carries with it some considerable issues that suggest this form of knowledge translation cannot be the only utilized approach.

Alternate forms of knowledge translation such as publishing in applied journals, sharing athlete narratives, and communicating stories to the broader public are additional strategies that are currently underutilized within the concussion landscape (Day & Wadey, 2022). This was one of the reasons we deliberately chose to publish our articles in the journals we did (i.e., *Journal of Applied Sport Psychology, Journal of Clinical Sport Psychology, Journal for Sport Psychology in Action*), as these journals are written towards applied *and* research audiences. Our hope is that publishing within these journals might theoretically increase access to the results to draw attention to the important broadening of constructs like fear. To further enable knowledge translation, we chose to share accessible athlete and MPC narratives (i.e., Articles 1 & 3), recommendations deliberately tying research and applied practice (e.g., how MPCs and other sport psychology professionals could interpret research results; Articles 2 & 3), and recommendations for practitioners wishing to leverage similar models of collaborative knowledge development (i.e., sections on contributors to a successful CoP & practical value for professional development and lifelong learning; Article 4). In addition, portions of the results were presented at six conferences including academic and applied audiences, and the research earned an AASP Foundation award for excellence in science-practitioner endeavours. Within some of these conferences, we attempted to shine a spotlight on the roles of fear and confidence during recovery, while encouraging practitioners to address them with their athletes. Together,

the presentation of results, dissemination strategy, and deliberate efforts to bridge communication between application and research represent an important contribution to the field, and one that we hope continues to snowball and promote further knowledge translation by the research community.

Critiquing the Dominant Paradigm

Consensus statements are one of the commonly relied upon knowledge translation mechanisms within the concussion landscape to date. Generally, consensus statements have the purpose of furthering the understanding of an issue, method, or procedure, and do so by convening a panel of experts who review relevant research (Ingravallo et al., 2014). Unsurprisingly, consensus statements on concussion matters have been difficult to develop due to the complicated nature of the injury, and the diverse research disciplines whose expertise relates to aspects of the injury (e.g., neuroscientists, sport researchers, athletic therapists). In an effort to address incoherence, a variety of associations and working groups have attempted to regulate this disparity by releasing consensus statements. Although these statements are typically multidisciplinary in origin, the international and national bodies that have considered concussions have generally cogitated research through the lens from which they derive (e.g., American Academy of Clinical Neuropsychology and other divisions within the United States target the role of neuropsychologists in concussion and management and evaluation in their position statement; Echemendia et al, 2012). Thus, to appreciate what knowledge is communicated through them, it is important to recognize that the respective goals and motivations of these organizations have influenced the results of each of these statements.

A further issue with consensus statements is the network of individuals commonly involved; inevitably, the expertise of those involved in the creation of these statements colours

the information which is ultimately presented (e.g., sports medicine physicians reviewing scientific literature related to sports medicine are less likely to consider and include information related to neuropsychology as it typically falls outside their scope of practice). In spite of this, consensus statements such as those produced by the Concussion in Sport Group (i.e., Aubry et al., 2002; McCrory et al., 2005; 2009; 2013; 2017) continue to be the gold standard for informing concussion management and rehabilitation efforts across sporting organizations and represent some of the most cited works on concussion (Sharma & Lawrence, 2022). Importantly, these statements and subsequent research testing the recommendations of these statements have been valuable in improving concussion management strategies. For example, the removal of an athlete from sport following a suspected concussion is an important early step within the Concussion in Sport Group's recommendations (McCrory et al., 2017), and recent research suggests the timeliness of this removal is critical. A preliminary repeated-measures design study indicated that athletes who continued to play after incurring a concussion had worse neurocognitive performance and were more likely to experience protracted symptoms than those who were removed immediately. Athletes who continued to play for 15 minutes or less after incurring the concussion took up to approximately 10 days longer to recover than those who were removed immediately, and those who played 15 minutes or more took between 13 and 25 days more to recover than those removed immediately (Charek et al., 2020).

The improvements in concussion management as a result of the changes in protocols and research advancements cannot be understated (O'Halloran et al., 2022). However, aspects of concussion management and rehabilitation that are not present within these statements are often omitted from concussion management efforts. While this omission may not be intentional on the part of the sport organization, the absence of concussion experts within these organizations who

understand the multidimensional nature of the injury risk not providing other elements of support (e.g., support mechanisms that can reduce the risk of injury and/or long-term consequences, but fall beyond their area(s) of expertise). Additionally, there is no consensus statement that presently exists regarding the psychological, social, and/or cultural aspects of the concussion experience. Perhaps as a consequence of this, paradigmatic dominance in the field (see below), and/or the lack of inclusion of experts from these disciplines of research and practice at these large-scale meetings, leaves consideration of psychological, social, and cultural aspects of concussion largely absent within concussion policy on an international scale. As presented in Article 2 and evidenced by the narratives in Article 1, this omission can result in a gap in care for these aspects, and ultimately have a significant influence on the athlete's injury experience and recovery.

Underlying these consensus statements is the dominant paradigmatic lens of the research published on concussion. According to Spencer and Molnár (2022), the paradigms most commonly leveraged within a discipline of research should be challenged as the prominence of one can result in an undiversified perspective. They, along with other scholars note that the dominant epistemologies within a research field not only influence research production, but can inadvertently exclude other epistemologies that would enable us to produce different knowledge, as well as produce knowledge differently (Goodley & Lawthom, 2005; Spencer & Molnár, 2022; Adams St. Pierre, 2006; Wadey & Day, 2022). Based on a review of concussion citation metrics, the post-positivist paradigm is dominant in the field, revealing cross-sectional and randomized trials as the most commonly leveraged methodologies among the 50 most annually-cited concussion articles, alongside consensus statements (Sharma & Lawrence, 2022). Importantly, diversifying methodologies creates the capacity for action and ownership in research as the

researchers' own lens shapes the questions asked, the perception of relevance of data, and ultimately the manner in which the results are reported and disseminated (Eales & Peers, 2016; Enderle & Mashreghi, 2022). Recent criticisms of concussion research evidence and sport-injury consensus statements highlight the historical dominance of this perspective, while prompting researchers to employ diversified methodologies and research lenses, as well as include contributors with expertise in using qualitative methodologies who are often not included within these statements (Shrier, 2021; Wadey & Day, 2022). As increasingly diverse methodological, ontological, and epistemological orientations are employed, it is possible that challenges related to knowledge translation and research dissemination may be inadvertently or directly addressed.

This research project as a whole aimed to leverage an uncommon methodology, diversified methods, and the minimally employed participatory paradigm to challenge the status quo. This novel approach to concussion research is shared by a recent movement in sport injury psychology more broadly (Day & Wadey, 2022), whereby continued calls for such diversification (e.g., Ventresca, 2020) continue to validate the need for shifts in the way we understand concussive injuries. We have also deliberately sought to integrate the results of our research within the context of the broader landscape, concussion policies, and consensus statements to highlight discrepancies, challenge the dominant paradigm, and support the translation of knowledge across disciplines. For example, Article 1 explored athlete experiences through different methods by sharing narratives, theoretical understandings, and encouraging the readership to consider their own perspectives on the results in an effort to engage the audience in critical thinking. Article 4 represents a different tact, in which we shared direct quotes and perspectives from MPCs who participated in collaborative knowledge creation and dissemination. This article intentionally highlighted the breadth of positive value it had for us as

co-researchers, why contributing to the team of concussion management was important, and noted how transformative that process could be for not only the membership, but the broader mental performance field.

Advancing Concussion Protocols

Despite issues of paradigmatic dominance within concussion research and its influence on consensus statements, researchers and practitioners need to work within current care models to effect improvements in knowledge translation at this time. While service providers do not all universally adhere to the recommendations of concussion consensus statements (Lempke et al., 2022), they are undeniably commonly disseminated and acknowledged on an international scale (Alla et al., 2011; Patricios et al., 2018; Weiler et al., 2021). If the goal is to increase the likelihood that psychological, social, and cultural needs will be addressed during concussion management, research on these needs should be integrated within the commonly leveraged protocols at this time. While the intended audience of the Concussion in Sport Group consensus statements is clinical in nature, with physicians being the primary target (McCrory et al., 2017), the wide use of these statements makes them an optimal target for increasingly accessible knowledge translation across boundaries in the landscape. As such, the rest of this chapter is dedicated to integrating the identified needs within the 11 R's model of the most recent statement (McCrory et al., 2017), an effort that was initiated in Article 2. Of note, it is expected that a new consensus statement will be developed following the Concussion in Sport Group's next meeting, which is anticipated for October 2022 (Schneider et al., 2022). Table 2 provides details on key components of each of the 11 R's within the 2017 statement. While it is not known at this time whether the Group will make modifications to the fundamental components of the 11 R's presented below, the model should be reviewed and modified as the statement evolves.

Given the intended audience of the Group's consensus statements and the experts who contribute to these statements (see author information in McCrory et al., 2017), it is not surprising that symptoms, diagnostics, and treatments across the 11 R's have a clinical and/or physiological orientation. As such, the inclusion of psychological, social, and cultural factors and needs is not necessarily appropriate provided the definitions of each of the 11 R's. However, the collaboration with athlete and MPC co-researchers throughout this doctoral research demonstrates that policies, organizations, and a variety of contextual factors can influence the concussion experience and should be considered throughout the injury (Articles 1, 2, & 3). The psychological, social, and cultural factors and needs identified in Articles 1, 2, and 3 represent a starting point for integrating information across boundaries and paradigms within concussion research. Table 3 serves to theorize this integration based on the experiences of the athlete and MPC co-researchers. This table is not intended as a one-size-fits-all theorization, nor a prescription; rather, it is intended as a working model whereby researchers and practitioners adapt it to the unique demands and context. As discussed in Article 1, a further point in navigating this table is that each need and factor should not be considered in isolation. Instead, these needs and factors, although separated for simplicity of presentation, should be recognized as interacting and interrelated. For example, while emphasis placed on sport culture is situated only in the *recognize* and *residual effects and sequelae* phases, sport culture has an impact on the importance an athlete may place on their athletic identity and/or what social support looks like within a team (Articles 1 & 2). As such, it is possible that the influence of these factors or the significance of needs across the 11 R's is impacted by sport culture. Collectively then, Table 3 should be regarded as the doctoral candidate's interpretation of the results with emphasis placed on the time points associated with the needs and factors that were shared by the co-researchers.

Table 2.

11 R's of SRC Management

R	Main Goal	Key Components of Phase
Recognize	Recognize when an athlete may have incurred a concussion	• Compare signs and symptoms to definition of SRC • Complete side-line evaluation and appropriate diagnostic assessments
Remove	Remove the athlete from sport if they exhibit any signs or symptoms	• Complete more comprehensive assessments • Diagnose concussion (if physician available)
Re-evaluate	Re-evaluate athlete to determine clinical status and rule out other, more severe brain injuries	• Neuropsychological assessments/imaging • Comparison to baseline or previous assessments
Rest	Allow the athlete to physically and cognitively rest for a brief period	• 24-48 hours of rest during acute phase of injury • Gradual progressions into physical and cognitive activity while staying below symptom exacerbation thresholds
Rehabilitation	Collaboratively manage rehabilitation efforts targeting symptoms while addressing confounding factors	• Treatments (e.g., psychological, cervical, vestibular) for ongoing/persistent symptoms • Facilitate recovery by catering to the individual's needs
Refer	Refer athlete to appropriate clinicians for persistent symptoms to enhance treatment	• Referral time frame typically after 10-14 days in adults • Target-specific treatments for medical, physical, and psychosocial factors
Recover	Athlete returns to normal activities (i.e., clinical recovery) following resolution of symptoms and normal balance/cognitive functioning	• Estimate time of recovery • Influenced by individual constellation of factors and symptoms • Consideration for and treatment of other confounding conditions (e.g., hyperactivity)
Return-to-sport	Athlete returns to sport after completing graduated strategy	• Working through 7 central stages of rest, symptom-limited activity, light aerobic exercise, sport-specific exercise, non-contact training drills, full contact practice, and return to competition

Reconsider	Consider the age of the athlete to determine if additional symptoms, etc., or return-to-school strategy needs to also be implemented	• For children and adolescents, a 5-stage graduated return-to-school strategy is recommended (i.e., rest, daily activities at home that do not give the child symptoms, school activities, return to school part-time, and return to school full-time)
Residual effects & sequelae	Evaluation and consideration for potential long-term consequences	• Neurobehavioural clinical orientation
Risk reduction	Combination of pre-participation evaluations, prevention strategies, and knowledge translation efforts	• Baseline evaluations to enable comparisons upon suspected concussion • Use of helmets and other equipment and training to minimize potential risk factors • Concussion tools, education, and other knowledge translation strategies to access sport community

Note. Summary of 11 R recommendations for concussion management as indicated within the Concussion in Sport Group's 5th consensus statement (McCrory et al., 2017), which is widely cited and commonly leveraged within sport organizations' concussion policies and protocols.

Table 3.

Integration of Dissertation Result Recommendations into 11 R's Model

"R" Phase	Psychological, Social, Cultural Needs or Factors	Specific Considerations
Recognize: *Recognize when an athlete may have incurred a concussion*	• Trust in relationships • Sport culture	• Pre-existing team/staff relationships • Safe environment that promotes identification of potential concussion/symptoms on the part of teammates, staff, etc.
Remove: *Remove the athlete from sport if they exhibit any signs or symptoms*		
Re-evaluate: *Re-evaluate athlete to determine clinical status and rule out other, more severe brain injuries*		
Rest: *Allow the athlete to physically and cognitively rest for a brief period*	• Acceptance • Normality	• Accepting that rest is a productive and normal part of the recovery process • Lack of routine/connection to others in this time may be difficult • Typically relied upon active coping strategies like physical activity, distraction, etc. are likely unavailable
Rehabilitation: *Collaboratively manage rehabilitation efforts targeting symptoms while addressing confounding factors*	• Acceptance • Normality • Self-efficacy	• Accepting and respecting symptom thresholds to promote recovery • Changes to routines and connections with sport environment may be difficult • Non-linear progress may affect feelings of self-efficacy in execution of rehabilitation exercises
Refer: *Refer athlete to appropriate clinicians for persistent symptoms to enhance treatment*	• Self-efficacy • Social support • Trust in relationships	• Perceived inabilities to recover and referral requirement to additional experts may be frustrating • Support system may be able to identify symptoms that may require referral • Positive social support and validation of experience during referral process

Recover: *Athlete returns to normal activities (i.e., clinical recovery) following resolution of symptoms and normal balance/cognitive functioning*	• Athletic identity • Confidence • Psychological readiness?	• Perceptions of athlete and team about toughness and commitment to team during recovery • Return to sport anxiety and fear of reinjury • Mentally confident in recovered state
Return-to-sport: *Athlete returns to sport after completing graduated strategy*	• Confidence	• Return to sport anxiety and fear of reinjury • Confidence in performance abilities and re-integration into team environment
Reconsider: *Consider the age of the athlete to determine if additional symptoms, etc., or return-to-school strategy needs to also be implemented*		
Residual effects & sequelae: *Evaluation and consideration for potential long-term consequences*	• Acceptance • Athletic identity • Confidence • Social support • Sport culture	• Acceptance of circumstances and being realistic about process • Misalignment with athletic identity and recovery capabilities • Fear of long-term consequences • Positive social support and validation of experience • Risk of team-first/performance mentality over wellness necessity
Risk reduction: *Combination of pre-participation evaluations, prevention strategies, and knowledge translation efforts*	• Athletic identity • Social support • Trust in relationships	• Team/sport environment safe for disclosure • Education and myth-dispelling about concussions and why taking care of it is not a sign of weakness or lack of commitment • Promotion of strategies within team on how to support an athlete experiencing a concussion (positive types of social support)

Note. Table integrating psychological, social, and cultural needs and factors identified through Articles 1 and 2 into the 11 R's from the Concussion in Sport Group's 5th consensus statement (McCrory et al., 2017). As some stages are the responsibility of a clinical physician only, psychological, social, and cultural factors and needs have been omitted from the table for these R's. Additionally, given the age of the athletes targeted within this dissertation (i.e., elite athletes over the age of 18) and the emphasis on sport context, the "Reconsider" phase's orientation towards children and adolescents in school has not been addressed within this dissertation.

Practical Implications & Future Applied Directions

One of the advantages of participatory research as discussed earlier in this dissertation is its orientation toward action. In fact, inquiries using the participatory paradigm are often considered incomplete without subsequent action (Guba & Lincoln, 2005; Lincoln et al., 2017). With this action orientation in mind, a collaborative inquiry methodology was selected to prompt applied action, and different forms of action are represented throughout this research. This novel approach to research on concussion management represents a significant and important shift in how SRCs are understood, and this section serves to highlight several key contributions from this research to current and future applied practice.

According to Brooks and Watkins (1994), there are four dimensions to action inquiry strategies, inclusive of collaborative inquiries. The first is that the intended result of the inquiry is "the construction of new knowledge on which new forms of action can be based" (p. 11). For this doctoral research, the generation of knowledge within the focus groups and CoP was central, as athletes and MPCs deliberately considered future directions and support mechanisms for concussive injuries. This intent also enabled the creation of Article 3 as a knowledge translation tool, whereby the knowledge co-created in the CoP was shared externally to facilitate new action on the part of others in the mental performance community. The second dimension of action inquiries according to Brooks and Watkins (1994) is that the population considered by the research plays a central role in the research itself. For this project, this required the ongoing involvement of elite athletes with a history of concussion throughout Phase A and MPCs operating within the high-performance sport context throughout Phases B and C. Together, engagements from both of these co-researcher groups supported the effectiveness of the inquiry itself and enabled both athlete and MPC co-researchers to contribute, creating opportunities for

personal and/or collective action (e.g., the writing of the narratives in Article 1). Brooks and Watkins's (1994) third dimension articulates the importance of data being generated from the first-hand experiences of the co-researchers. The understanding of each co-researcher's experience was at the forefront of priorities for this project, and this prioritization is highlighted by the experiential-oriented questions and prompts within the focus groups (see Appendices C & G for the questions guide), as well as the experiential perspectives emphasized in Articles 1 and 4, for example.

The final dimension of action inquiries according to Brooks and Watkins (1994) focuses more broadly on generating change; this could include "improvements in professional practice, organizational outcomes, or social democracy" (p. 12). As presented above and throughout this dissertation, the first three dimensions were prioritized as part of the design and conduct of the inquiry, as well as within the presentation of the results. This chapter is written with the aim of exploring practical implications within this fourth dimension of action, as this dimension corresponds well with applied practice and broader change post-inquiry. Specifically, this chapter will serve to integrate some key results from Articles 1-3 and the Additional Results chapter into the original PSTP. The goal of this chapter then is to advance a framework for mental performance service delivery and identify future research directions to improve the guidance of these strategies. Table 4 is presented at the end of this program to summarize the recommendations proposed; it is not intended to be a prescription, but rather a set of tools that can be selected for the individual athlete's needs. In addition, it is important to acknowledge that there is still a significant amount of quality research that is required to assess the effectiveness of many of these tools and techniques; as such, MPCs should critically consider the state of the research behind the strategies before implementing them, as they would with other skills and

techniques used within their practices. Some suggestions for where future research is needed are also clarified within the sections below.

Modifying the PSTP

At the centre of the concussion experience, we find an athlete. The athlete's journey to get to the high-performance sport context may share similarities with the journeys of other athletes, but remains a journey that is uniquely their own. Their life experience, cultural background, biology, and a plethora of other factors shape their journey, and this unique constellation of experiences and factors is what makes their story their own (Wiese-Bjornstal, 2021). Efforts to learn and understand these experiences (and the factors that shape these experiences) are required when supporting an athlete with a concussion; this understanding becomes critical to effective SRC management (Hamsho et al., 2022; Register-Mihalik et al., 2020; Wayment & Huffman, 2019). As research continues to show, SRC experiences differ between and within individuals (van Ierssel et al., 2022), so a deliberate effort to improve our understanding of the athlete's experience can enhance the effectiveness of the strategies provided, and result in better recovery outcomes (Maaranen & Brewer, 2021; Wiese-Bjornstal, 2021).

Within this dissertation, psychological factors of athletic identity, injury and limitation acceptance, self-efficacy in recovery, confidence in returning to sport, and perceptions of normality were discussed as influential factors that shape the concussion experience. Some of the psychological skills training discussed in the original PSTP may be beneficial in addressing some of these facets. As discussed within the Additional Results, both athlete and MPC co-researchers liked the PSTP and saw value in it for responding to gaps in concussion care and needs within the SRC experience. Within Article 2, some of these strategies were also discussed

by MPC co-researchers as ones they had employed with their concussed athletes, highlighting positive effects within these types of interventions.

Imagery

Other strategies presented within the original PSTP may also be effective at addressing other needs with slight modification. For example, MPC co-researchers discussed introducing imagery as a method of helping an athlete mentally prepare to return to sport. Previous research from sport has shown that this kind of imagery can be helpful in enhancing confidence (Evans et al., 2006; Walsh, 2005), self-efficacy (Arvinen Barrow et al., 2013; Miller & Munroe-Chandler, 2019), and for reorganizing motor and sensory neural networks related to muscle re-engagement (Lebon et al., 2012; Maaranen & Brewer, 2021). Imagery that is focused on practicing aspects of sport performance (i.e., kinaesthetic and visual; Driedger et al., 2006) can also be beneficial from a motivation perspective. As injuries can be viewed as a setback or unproductive periods of time, imagery can be an effective tool for making time away from sport appear like an opportunity to enhance practice and performance upon return (Richardson & Latuda, 1995; J. Taylor & Taylor, 1997). This kind of imagery use is one that an athlete co-researcher also discussed in her focus group as valuable in her recovery (Article 2). In addition, research on returning to sport following SRC indicates that athletes may feel nervousness, fear, and/or forms of anxiety around returning to sport (Bloom et al., 2004; Covassin et al., 2017). For athletes who have previous experience with imagery, they may be able to produce self-guided practice to help them prepare to return; for others, developing a script designed to emphasize feelings of confidence and competence in sport may also be valuable (Gledhill & Forsdyke, 2021; Gledhill et al., 2020). The PETTLEP model of imagery (Holmes & Collins, 2001) may be useful in structuring such scripts (Driedger et al., 2006; Gledhill & Forsdyke, 2021), but caution should be taken as some visuals

or kinaesthetic imagery may provoke symptoms in some athletes (Additional Results). While these potential applications are supported by some research, there is currently a lack of scientific evidence suggesting the effectiveness of such techniques for injuries and concussions in particular. Further investigations into the application and effectiveness of this strategy are warranted.

Goal-Setting and Goal-Management

Another psychological skill that was discussed as potentially modifiable within the original PSTP was goal-setting/goal-management. Goal-setting and goal-management practices have been documented as effective in assessing and recognizing examples of effective self-regulation and self-efficacy in rehabilitation practices (Evans & Hardy, 2002; Coppack et al., 2012), seemingly making them a logical fit for addressing some psychological needs during rehabilitation (e.g., self-efficacy). MPC co-researchers from Phases B and C shared this perspective and advocated for flexibility in the goal-setting strategies employed to support athletes' adjustment of goals when necessary (e.g., Article 3). Once again however, limited research is available on the topic to support broader applications for sport-related injuries, let alone SRCs (Brinkman et al., 2019). Goal-setting and goal-management research appears promising, but further exploration into assessing different strategies (e.g., SMARTER goal-setting, goals of self-acceptance) is needed within this injury context.

Ultimately, how these skills and techniques are applied is largely dependent on the athlete, MPC, and the context. The MPC should review research critically and responsibly before applying any such interventions and consider the appropriateness for the athlete's unique circumstances before engaging. In addition, there is limited research on the use of these techniques for concussed elite athletes to date; while an interesting topic, it is beyond the scope

of this dissertation, but these skills and techniques should be critically considered in future research. Based on the input of the athlete and MPC co-researchers, the PSTP appeared to be positively received and is likely a valuable modifiable framework for MPCs working with concussed athletes, and particularly for those who have limited experience in this context.

Expanding the PSTP

The original PSTP proposed by Seguin and Durand-Bush (2019) was designed with MPCs in mind, and its purpose was to guide MPCs in the provision of support to concussed athletes. The PSTP was intended to be adaptable and individualized to each athlete's experience, and was based on the injury, mental performance, and high-performance sport literature that was available at the time. Based on the research advances made since the PSTP's inception, there is an opportunity to expand the original PSTP to other psychological skills. As was discussed above, further research is required on the application and effectiveness of these skills with concussed elite athletes. As such, the suggestions below are preliminary in nature and draw from the research currently available. Once again, it is beyond the scope of this dissertation to assess the effectiveness and appropriateness of these interventions; instead, the recommendations should be leveraged as a guide for future research and skills for MPCs to critically appraise for appropriateness in their working context.

Mindfulness

One psychological skill that may be a useful addition to the PSTP is mindfulness; interventions using mindfulness techniques have been advocated as potentially helpful for athletes coping with a variety of sport-related injuries and in supporting their rehabilitation efforts. For example, one study involved athletes engaging in formal mindfulness meditation over an eight-week period (Pappous et al., 2021). This qualitative study indicated that practicing

mindfulness helped increase athletes' tolerance of pain, their ability to cope with pain, and supported a change in their thoughts around pain (i.e., decreased attachment to negative thoughts about their injury). This echoed the results of a small pilot study in athletes with an anterior cruciate ligament (ACL) injury, which indicated that athletes had improved recovery and wellbeing outcomes after engaging in consistent mindfulness practice (Mahoney & Hanrahan, 2011). Both programs were based on principles developed by Kabat-Zinn (2003) under the umbrella of mindfulness-based stress reduction (MBSR) training.

Despite some advancements, a recent chapter suggested a lack of studies demonstrating that mindfulness is effective within sport injury rehabilitation, and that further research is needed (Gledhill, 2021). However, the benefits reported in sport research around improvements in athletes' health, wellbeing, and performance after engaging in mindfulness training indicate it may be a valuable addition to the PSTP, particularly as these improvements align with some of the needs reported within this dissertation. A multi-practitioner reflection suggested that the mindfulness, acceptance, and commitment approach (MAC) supported athletes' achievement of goals (Josefsson et al., 2020). This approach includes: psychoeducation; an introduction to mindfulness and cognitive defusion; a discussion on value-driven behaviours; specific mindfulness concepts of acceptance, enhanced commitment, skill consolidation (i.e., mindfulness, acceptance, commitment); and the maintenance and enhancement of these techniques. In particular, the achievement of injury goals would be valuable from the perspective of addressing needs related to self-efficacy (Article 2), where the actual or perceived experience of progress towards rehabilitation outcomes may enhance adherence to protocols and trust in the service providers guiding the athlete's progression (Article 1).

In contrast, the MAC approach has been viewed as demanding to athletes in the past (Josefsson et al., 2020), and the commitment of 1-1.5 hours a week over 7-12 weeks (Gardner & Moore, 2007) may be beyond an athlete's tolerance for cognitively-demanding activities, particularly during acute phases of injury. Suggestions for mindfulness practice with regards to sport performance enhancement indicate that longer periods of practice are more effective (Sappington & Longshore, 2015; Thompson et al., 2011), so it is possible that shorter mindfulness programs may not have the same impact (Josefsson et al., 2020). As such, mindfulness-based interventions for SRC support may be better suited to athletes who have previous experience with mindfulness training, particularly with those who practice mindfulness regularly. Athletes who have had limited to no training in the area would likely require more deliberate education and practice before reaching the level of proficiency that would potentially yield positive outcomes. For those still wishing to include mindfulness interventions with less experienced athletes, it would likely be beneficial to increase the length of the MAC intervention (e.g., 15 weeks; Josefsson et al., 2020), or leverage other mindfulness strategies with shorter durations (e.g., mindful meditation training in sport; Baltzell & Summers, 2018; mindful sport performance enhancement; Kaufman et al., 2018).

Research in and out of sport has shown that mindfulness enhances psychological flexibility (Lundgren et al., 2020; Meyer et al., 2018), which Hayes and colleagues (1999) suggested includes acceptance. The absence of psychological flexibility can contribute to an unhealthy attachment to a conceptualization of the self (e.g., fixation on the loss of athletic identity; Harris, 2009). Articles 1 and 2 highlighted how athletic identity and acceptance had an impact on recovery trajectories and outcomes for athlete co-researchers. The original PSTP included self-regulation and goal-setting/goal-management techniques that may be suitable to

address those elements for some. For other athletes with familiarity with mindfulness, or those who are particularly struggling with athletic identity loss and/or acceptance, mindfulness may be a potentially valuable skill addition.

Self-Talk

Self-talk is another psychological skill that was not included in the original PSTP. Based on the feedback of MPC co-researchers, the experience of athlete co-researchers, and recent research advancements, this is another psychological skill that may be a potentially helpful addition to the PSTP. It was initially omitted from the program due to the lack of research evidence supporting its use within injury spaces; while research has improved on the topic since then, there is still a lack of supporting evidence. Some research has suggested its potential usefulness, and in more recent years, has indicated that it may be valuable for sport injuries in general. For example, Podlog and colleagues (2011) advocated that self-talk oriented towards cognitive restructuring of experiences, self-monitoring, and positive reappraisal to reduce concerns may be useful for sport injuries. Further, a review conducted by Santi and Pietrantoni (2013) reported that athletes using positive self-talk experience decreased negative cognitions, as well as decreased experiences of depression and anxiety. Positive self-talk has also been demonstrated as helpful for managing negative mood disturbances related to injury circumstances, as well as for increasing adherence and improving self-efficacy regarding rehabilitation protocols (Christino et al., 2015; Scherzer et al., 2001). In addition, a recent descriptive qualitative research study with elite and non-elite athletes considered a specific type of self-talk usage in broader sport contexts (Latinjak et al., 2020). Within this study, goal-directed or instructional self-talk (e.g., “take your time and breathe deeply”) was reported as being used by a small sample of athletes for self-regulation purposes around injuries. More often,

however, athletes reported applying self-talk to increase cognitive and behavioural control, to become aware of and manage arousal, to reappraise events more positively and/or realistically, and to improve attitudes around upcoming performance situations (Latinjak et al., 2020).

Current and previous criticisms of self-talk usage for injuries have been clear. One such criticism indicated that guides or suggestions as to how self-talk can be trained within the context of sport injuries were largely absent (Arvinen-Barrow et al., 2010). More recently, criticisms of research on self-talk have included methodological concerns (e.g., often limited to single-time point designs; Gennarelli et al., 2020), or a lack of consideration for confounding and/or moderating variables (Goddard et al., 2021). While these research critiques are warranted, the potential use of self-talk within injury contexts, including return to sport, has been actively advocated for by experts in psychology and sport injury. For example, a potential application of self-talk discussed by researchers is in reframing harmful internal dialogue to improve self-confidence (Arvinen-Barrow & Clement, 2020; Clement et al., 2015; Theodorakis et al., 1998). Other recommendations regarding self-talk around emotional states may be to simply help the athlete become aware of organic self-talk (i.e., inherent self-statements or thoughts that are directed internally; these may be controlled or uncontrolled), and to use cue words to trigger self-regulation strategies (Fritsche et al., 2020). This may come in a variety of 'if-then' statements (e.g., "*if* I feel frustration about my rehabilitation progress, *then* I will take a couple of deep breaths and turn my focus towards what I can control in this moment"). MPCs may also be inclined to leverage reflexive strategies to reflect on organic self-talk to change it towards goal-directed self-talk (i.e., overt or covert controlled statements used to provide instruction and make progress towards a goal; Fritsche et al., 2020). Recommendations from research on self-talk for emotions include identifying potentially recurring, complex situations; recognizing automatic

responses; and leveraging goal-directed strategies to enable self-regulation (Fritsche et al., 2020; Latinjak et al., 2019). As such, self-talk strategies may be useful as a complementary skill to embed within other elements of the PSTP (e.g., self-regulation, goal-setting/goal-management), or as a strategy on its own to focus on reframing experiences (e.g., "this is an opportunity to focus on my recovery"), focus on the process (e.g., "if I do this exercise, then I am sticking to the plan and giving myself the best opportunity to recover), and to normalize the experience (e.g., "concussion recoveries aren't always linear, so it's okay that I feel like today was harder than yesterday").

Going Beyond Psychological Skills Training

Psychological skills training is but one strategy at the MPC's disposal in supporting concussed athletes. SRC management and support strategies should be individualized and shift away from the one-size-fits-all approach; this means that psychological skills training is but one piece of the care puzzle that may or may not be included or appropriate for an athlete's recovery. Recently, Wadey (2019) indicated that psychological skills training is not always effective for sport injuries. Thus, the decision to include psychological skills training and other support strategies should be guided by the athlete's unique combination of pre-existing factors (e.g., available social support, injury history, confidence), needs (e.g., psychological, social), and context.

Consulting and Therapeutic Techniques. Beyond psychological skills training, consulting and therapeutic techniques involving cognitive-behavioural and/or acceptance-commitment approaches may target some of the challenges athletes face regarding acceptance and perceptions of normality. For example, acceptance commitment strategies like acceptance and committed action were discussed within a recent injury-related case study in semi-elite youth

sport. This study showed the potential for staying in the present moment and restructuring internal narratives (Price et al., 2022). Cognitive-behavioural techniques like thought-records may be beneficial for identifying unhelpful thinking patterns or defining realistic expectations around recovery (R. Conder & Conder, 2015). The timing and application of these methods depends on the expertise of the MPC and the athlete's experience and needs. Once again, future research should explore the application and effectiveness of such interventions for SRC.

Facilitation of Social Support. An additional aspect the MPC is in a position to support is in facilitating social support. As discussed across the Results of this dissertation and within the General Discussion, the existence, availability, and type of social support had an impact on athletes' experiences of SRC. MPCs should consider having early discussions with athletes to identify potential support persons. Education to teams and staff to clarify appropriate forms of social support may be effective at enhancing communication throughout the course of the injury. Research from sport and the military has suggested this might include education on communicating empathy, validating experiences, and/or providing examples of how teammates and others can help (Kita et al., 2020; Sanderson & Cassilo, 2019; Weber Rawlins et al., 2021).

Somewhat similarly, peer-interventions (e.g., peer-education, peer-support, peer-counselor, peer-facilitator) have been found to be effective in improving a number of psychological dimensions of experience (e.g., self-efficacy, self-management, psychological outcomes) in other injured populations (e.g., spinal cord injuries; Beauchamp et al., 2016; Houlihan et al., 2017; Shem et al., 2011). Within sport, peer support groups have been used to support athletes with a variety of injuries and are often advocated for as an intervention strategy whereby athletes can share their experiences with others who have experienced the same or similar injuries (Arvinen-Barrow et al., 2020; Sullivan et al., 2022). In recent years, peer-support

programs have started to emerge within the realm of concussion (e.g., Al-Hakeem et al., 2021; Kemp et al., 2020), but limited research has discussed the effectiveness of such interventions, nor have such interventions been studied within the context of high-performance sport.

The MPC could also consider the inclusion of team and individual-athlete goals around enabling positive social support opportunities throughout the injury. Goals that draw on strategies related to the development of social identity (e.g., opportunities to promote senses of belonging and/or emotional attachment, supportive inter-team relationships, emphasis of a "selfless" team mentality), team enjoyment, and positive emotions (e.g., use of humour, challenge-mindset towards stressors, plan and organize fun team events) may be useful for creating engagements of social support while increasing a team's resilience around stressors like injuries within a team (Morgan et al., 2019; Sarkar & Page, 2022). In the event that an athlete is attending these activities with a concussion, the MPC and/or team/staff member coordinating these activities should be conscious of the athlete's tolerance for activities (e.g., limit social engagement activities that exacerbate symptoms). Ultimately, deliberate efforts to maintain social support throughout the injury (i.e., during recovery, rehabilitation, and return-to-sport) should be emphasized, and the MPC might play an important role in advocating for support.

Finally, for MPCs, drawing from other consulting and therapeutic techniques, as well as enabling positive social support are important tools to consider for the MPC's SRC toolbox. These strategies target psychological, social, and cultural needs and factors that were presented within Articles 1-3 and the Additional Results, and offer a wider scope of intervention strategies that could be leveraged beyond psychological skills training. As such, the section above and this dissertation as a whole represent an important step towards hypothesizing and enhancing support strategies in the psychosocial domain. While further research is needed on the application and

effectiveness of these techniques within the contexts of SRC rehabilitation and high-performance sport, research from proximal domains suggests that these strategies may be useful in addressing some gaps that were otherwise not addressed in the PSTP or only targeted by one of the recommended skills.

Table 4.

Suggested Modifications to Original PSTP Based on Dissertation Research

Original PSTP	Suggested Modification(s)
	Education on concussions and positive social support pre-, during, and post-injury
Intake[a] • Basic demographic questions • Major areas of concern and/or interest for athlete • Standard intake and interview (as with other, non-injured athletes; inclusive of previous psychological skills training) • Symptom inventory	Brief assessment of pre-conceptions and previous experiences of concussion
	Normalization of experience and psychoeducation regarding concussion
	Resilience-based and strengths-based questions
	Identification and/or exploration of social support network
	Symptom inventory differs between chronic and acute stages of injury; tracking mechanisms will depend on athlete preference; goal is to demonstrate progression over time
Self-Regulation[a] • Education on relationship between thoughts, emotions, and physiology • Importance of self-awareness and self-monitoring to respect symptom thresholds and strategize recovery • Identification of positive and negative (symptom-related) triggers	Embed questions and strategize social and other forms of support for significant upcoming time periods where self-regulation strategies might be tested and/or more difficult to apply (e.g., approaching major competitions where return to sport might not yet be possible)
Goal-Setting & Goal-Management • SMARTEST goal-setting (specific, measurable, action-based, realistic, time-based, elastic, sensation-matched, trustworthy) • Short-term, action-based orientation • Goals of self-acceptance for if recovery doesn't progress as desired	Emphasis on revisit/revise goals as necessary (e.g., SMARTER may be more appropriate in some cases to help focus an athlete's attention toward recovering effectively)
	Create goals around enabling social support (particularly early in injury)

Relaxation • Strategies to manage stress, arousal, and symptoms • Deep breathing, active and passive progressive muscle relaxation (scripts provided)	Include symptom evaluations pre- and post-exercise to demonstrate impact of activity on symptom levels
Imagery • Facilitate skill maintenance (for those who cannot practice their sport) and recovery • Assessment of imagery abilities; healing imagery (script provided)	Encourage athletes who can tolerate imagery to use it as a strategy to practice aspects of their sport prior to returning
	Modify scripts as necessary (e.g., swirling visual may provoke symptoms for some)

	Additional skills and techniques that may be separate or complementary components of the training
	• Psychological Skills
	  ○ Mindfulness
	  ○ Self-Talk
	• Possible Therapies
	  ○ Cognitive-Behavioural Therapeutic Techniques
	  ○ Acceptance and Commitment Therapeutic Techniques

Wrap-Up & Future Plans • Evaluation of progress through active self-reflection • Debrief of engagement with PSTP • Identification of resources, self-regulation strategies, and goals moving forward	

Note. Table indicating key components of the original PSTP developed by Seguin & Durand-Bush (2019) along with suggested modifications based on the results shared within Articles 1-3 and the Additional Results chapter.

[a]Intake and Self-Regulation in original PSTP were proposed as a combined session. For navigability purposes only, they have been separated here.

Modifications to the Initial Research Plan

Despite initial plans to carry out additional research phases dedicated to knowledge translation and the evaluation of applied strategies presented in the Practical Implications and Future Applied Directions chapter, the Covid-19 pandemic resulted in a necessary modification to this plan and the removal of three phases. Specifically, one removed portion of the research was a phase dedicated to training MPCs on the concussion support strategies developed based on Articles 1-3 and the Additional Results through a continuing education course (i.e., Phase D). The training in this course was to include psychoeducation on SRCs, an examination of concussion protocols, a discussion on athletes' experiences based on research on the lived concussion experience, as well as a conversation about psychological and social needs. It was also to include activities such as role-play exercises where the MPCs would have engaged in practical examples and applied the modified PSTP and other support strategies. These MPCs would then have been asked to participate in a CoP over the course of a year, while they applied their learning to any concussed elite athletes they worked with, and continued on in a collective learning journey with other MPCs to advance professional knowledge (Phase E). These MPCs would have had similar reflection opportunities as those in Phase C (see Article 4) to learn about the value of such engagements, while collectively working through practical challenges, case studies, and reviewing current research, similar to the approach taken in Phase C.

Athletes were also to be included in this process, whereby those who consented, were working with these MPCs, and became concussed during the year of the CoP would have had the opportunity to share their experiences of working with the MPC and participate in focus groups to discuss whether they felt their psychological and social needs were met (i.e., based on the needs identified in Articles 1 and 2; Phase F). As a result of the pandemic, these phases of

research were not implemented, so the proposed PSTP modifications and MPC injection points during concussion management protocols were not evaluated within this research.

It would be valuable to consider these evaluations in future research, particularly as understandings of psychological readiness and relevant assessment tools (i.e., to assess if psychological and social needs are met) continue to advance. For example, a recent state-of-the-art review proposed an early definition of psychological readiness:

> An individual's state of mental preparedness to resume sport-specific activities and likely comprises three dimensions, including cognitive appraisals (confidence, expectations, motivations, risk appraisals, internal or external pressures), affective components (anxiety or fears about re-injury or movement, moods) and behavioral components (approach-avoidance behaviors to demonstrate physical function/neuromuscular control and engage in sport-specific tasks). (Podlog et al., 2022, p. 7)

In their discussion of literature on the topic thus far, Podlog and colleagues (2022) indicated that conceptual ambiguity has contributed to practical and theoretical difficulties in the field. They note such challenges as dimensionality of the concept (i.e., uni- or multidimensional), relativity of states (i.e., absence of negative states of mind versus presence of positive ones), and how this concept should be assessed (e.g., using existing scales, in connection to physical readiness). In addition, they suggest moving beyond a consensus-orientation, as the concept of psychological readiness is undoubtedly affected by physical, social, contextual, and cultural factors (Podlog et al., 2022). Given the state of research at this time, further investigation into the concept of psychological readiness and methods of assessing constructs like psychological and social needs are required before insight can be gleaned regarding the effectiveness and appropriateness of the proposed interventions (i.e., modified PSTP & MPC support throughout concussion protocols).

Future research considering the development of such concepts and assessments would likely benefit from mixed methods approaches to evaluate effectiveness (Creswell, 2014). Quantitative assessments would certainly shed light on the effectiveness of the interventions at addressing specific aspects of experience within participants (i.e., pre-during-post assessment comparisons; Boisgontier & Cheval, 2016; Neumann et al., 2017), but as this research has demonstrated, in line with Podlog and colleagues' (2022) review, the importance of understanding experiences and context cannot be understated. Fetters and colleagues (2013) highlight the importance of integrating joint displays within mixed methods research as a means of visually representing the data, drawing out additional insight beyond what could be gained from quantitative or qualitative results alone. Athletes' lived experiences can help draw out this insight by providing clarity on the athlete's reality, circumstances, and unique constellation of psychosociocultural factors that may otherwise be missed by quantitative or qualitative evaluations alone (Creswell, 2014; Fielding, 2012). Mixed methods approaches would particularly be useful too in considering the impact of the interactions between the aforementioned factors, which has been a previously articulated gap in concussion research (Ventresca, 2020).

Limitations and Future Directions

While this research bears considerable utility for research and applied practice, it is not without its limitations. From a methodological standpoint, this research is considered a partial form of collaborative inquiry as co-researchers did not all participate across the entirety of the project (Heron, 1996). One instance where further participation was not elicited was at the end of the study. Athlete and MPC co-researchers' contributions in Phases A and B were shared within Phase C, and the data generated from those two phases informed the strategies taken in Phase C, as well as guided the writing approach and content for Article 3. Re-engaging athlete co-researchers at this phase may have provided insight on the appropriateness or potential effectiveness of the developed strategies (i.e., modified PSTP and MPCs' integration into SRC protocols). As noted in the Modifications to the Initial Research Plan chapter of this dissertation, the state of research at this point in time is not adequate for quantitatively assessing whether these strategies support the identified psychological and social needs, nor if they are beneficial in supporting psychological readiness to return to sport. Research into the effectiveness and appropriateness of these strategies should be considered as these concepts and assessments continue to advance. At that point in time, consideration for the experiences of the athlete, the MPC, teammates, coaches, and other concussion support team members would likely be valuable in providing insight into context-appropriateness as well.

In a similar vein, there is an opportunity for future research to consider a broader integrative approach leveraging the concussion landscape (i.e., multidisciplinary teams). The CoP within this dissertation demonstrated value for MPC co-researchers across all dimensions of the Value Creation Framework (Seguin et al., submitted; E. Wenger-Trayner & Wenger-Trayner, 2021). Facilitating this type of multidisciplinary collaboration and learning opportunity has

previously been effective in other health-related domains, and has been shown to be of particular value for domains that are siloed (Fung-Kee-Fung et al., 2014). As knowledge translation and communication across disciplines has been a noted difficulty in concussion research and practice (Podlog et al., 2021), CoPs to bridge such silos and facilitate the dissemination of current research across disciplines may be a useful and powerful tactic. In their surgery-oriented CoP, Fung-Kee-Fung and colleagues (2014) noted that creating "a comprehensive support infrastructure that enables collaborative works across organizational and professional barriers" (p. 16) is key, along with the involvement of broad membership and consideration of diverse learning needs. Such efforts may particularly be of use in SRC contexts, given the importance of timely interdisciplinary collaboration (e.g., Chen et al., 2020; Rytter et al., 2019).

Finally, while the goal of this research was explicitly to consider elite athletes and SRC in the high-performance sport context, future research should explore psychological and social factors and needs in other athletic contexts. One advantage within high-performance sport is that multidisciplinary support teams are more often readily available (Frémont et al., 2022; Moen et al., 2022); when these teams and additional resources are less accessible (e.g., within youth and recreational sport), the support mechanisms required to effectively support athletes within these contexts may be significantly different or completely absent (Scratch et al., 2019). As such, it may be advantageous to replicate a similar research design as the one undertaken within this dissertation to other sport contexts (i.e., participatory methodologies; CoP and focus group methods) to explore their unique factors. This is particularly relevant as psychological, social, and cultural factors (e.g., tough sport culture, attitudes towards SRCs) have been documented as influential on SRC-related behaviours and outcomes in other contexts and warrant consideration (e.g., Pfister et al., 2016; Salmon et al., 2021).

Concluding Reflections

In reflecting on my experience throughout this research project, I firmly believe I have grown as a researcher, professional, and person. While I believe this to be a common experience of the doctoral learning journey, I also believe that the participatory and collaborative nature of this experience enabled a level of growth that I, personally, might not have been able to access through a different research lens. A specific instance I can point to where this growth through participatory research is evident is throughout the process of getting Article 1 published.

The first drafts of Article 1 included only the pilot data from discussions with two athletes. When it was rejected and critiqued for not having enough data, I was frustrated. I remember thinking, "but their stories are so important, they need to be out there", despite understanding the journal editor's and reviewers' perspectives. In collecting the data for Phase A, we initially employed an inductive thematic analysis, and while it yielded some interesting data, we felt the cultural and relational fabric of the content was missing; there was so much more to the story than the themes presented at face value. As such, I grew frustrated again, having initially seen the first analysis attempt as ineffective and wasted time. I certainly appreciated that the thematic narrative analytic approach was going to be better for what we were trying to do, but this fed my impatience. I wanted to get this research out there and work on other aspects of my dissertation. As a consequence of this, it felt like my pursuit of my PhD was slower than I wanted it to be. Beyond my own timeline goals, I knew the stories and data were important, and the sooner they were accessible to the greater research community, the sooner they could potentially make an impact. While working through the writing process of the narratives and their many revisions, my connection with the athletes and their stories continued to grow. And when the updated article was rejected for a second time, I got emotional. My personal passion for the topic and relationships with the athletes made me feel like I needed to

get their stories heard, understood, and reflected upon in a timely manner. The time-consuming process of revising the narratives with the athletes and the multiple revisions was ultimately for the best, as the article we ended up with is so much greater than the two originally submitted versions, and absolutely one of, if not my favourite from this dissertation. But getting to that publication point felt personal. When the article got rejected, I felt like one of the many athletes in this research who was dismissed. I remember talking to my colleagues in my lab about crying over the journal responses and receiving empathy, as they reflected they had similar experiences when their first articles were rejected. What I didn't realize at the time was that it was not so much that the article had been harshly critiqued; it was more that I was protective of the athletes and their stories, and that I wanted to make sure they were heard. Genuinely, this experience made it clear that I care about each one. They shared deeply personal things about their experiences, and it was my job to do something to make sure their stories were heard. So, the concept of rejection didn't feel like a critique of my work alone. It felt like a rejection of *us*, and I took that personally.

I feel this is reflective of many other instances in my doctoral journey, where initially I wanted to make strides in my personal academic pursuits, but as the research continued, it became more about making strides with and for my co-researchers. This journey was a rollercoaster of ups and downs; a balancing act of advancing in my degree and doing justice for those who invested in this process. We built a team and wanting to perform for my team, as I had as an athlete, became my driving purpose over anything else. And while having approached this research through a different paradigmatic or methodological lens could have yielded potentially valuable results, I would not change it. The connection I developed with the co-researchers along the way and the purpose I grew to love during this process brought meaning to my personal journey that, in my view, is irreplaceable. It helped me make sense of my own experiences of

concussions, further realize and advocate for my own role as an MPC in supporting athletes, and overall, enjoy the process of discovering meaning while contributing to applied and research communities. I feel this is apparent in the main themes that became evident from re-reading my reflections from throughout my degree. This became more than a project for me; I grew professionally and academically, learned how to adapt when confronted with new challenges, and experienced a transformation in aspirations from trying to advance my career to making large scale change through challenging the status quo. I believe this level of personal transformation would not have been possible had I not allowed the participatory process to take me where it was going. My anxieties, frustrations, and internal pressure became footnotes once I began to let go and participate in the research, instead of attempting to guide it and maintain control. Ultimately, this enabled me to enjoy the process whole-heartedly, and shifted the project from an initial goal of increasing understanding of the SRC experience, toward challenging the field to make important changes in how we research and support athletes with SRCs. I feel the resulting thesis is greater as a result.

Conclusions

Growth in the fields of SRC research and practice over the last two decades has yielded some substantially positive improvements regarding the management of SRCs. Recent calls for diversified methodologies and improved communication between applied and research communities provided the impetus for this doctoral research. Collectively, this novel approach yielded significant contributions for both applied and research domains. Complimented by the doctoral candidate's unique positioning as a former elite athlete with a history of SRC, a current MPC, and a researcher, the unique combination of research lenses and approaches enabled a new form of exploration of this complex, multifaceted injury.

The four articles included within this dissertation were purposely designed to address gaps in knowledge across the SRC landscape. Article 1 was designed to help readers understand psychosocial and sociocultural factors and implications pertaining to the lived concussion experience. Through the use of composite narratives and Bronfenbrenner's EST, the interrelatedness of factors and implications were presented. Article 2 aimed to combine experiential and professional expertise by considering psychological and social needs from the lens of elite athletes and MPCs in high-performance sport. Together, Articles 1 and 2 identified psychological (i.e., athletic identity, acceptance, normality, confidence, self-efficacy), social (i.e., trust in relationships, social support), cultural (i.e., tough sport culture), and other factors (i.e., advocacy, concussion protocols, timing related to major events and recovery) that influence experience and recovery. In Article 3, the collaboratively developed knowledge from the focus groups and CoP helped clarify the role of the MPC within concussion management processes. Through the sharing of best practices and considerations, Article 3 specifically targeted the applied field of mental performance service delivery to bring current research into practice, to

ultimately explore how MPCs might support psychological and social needs during SRC recovery. Lastly, Article 4 presented MPC co-researchers' experiences of value as members of the CoP. This article also provides information on structural elements and strategies that other service providers could consider if they seek to leverage an intradisciplinary or interdisciplinary social learning space.

Collectively, these four articles reveal how the absence or presence of psychosocial support during SRCs can impact athletes' lived experiences of these complex injuries. The articles also demonstrate that diversified approaches and theoretical lenses can help shed light on gaps between and within research and practice, as well as support communication across these two domains within the SRC landscape. Between the use of narratives (Articles 1 and 3), combined experiential perspectives (Article 2), and the strategic publication of results in journals which target both academic and applied audiences, the results of this dissertation were purposefully disseminated to support improved knowledge translation.

This dissertation as a whole represents a novel approach to SRC research. Through the identification of psychological and social needs, support mechanisms, diversified theoretical lenses, and the integration of results into current models of concussion management, this document is intended to challenge the status quo, critique methods of knowledge production, and widen the lens through which we examine the SRC experience. While the increasing use of lived experience research and qualitative approaches are facilitating a positive shift towards exploring aspects of SRC experience as interconnected and interrelated, we cannot stop here. It is clear that communication between research, applied, and disciplinary silos is still a significant issue. As researchers, we have a continued responsibility to collaborate across disciplines, improve the manner in which knowledge is translated, and ensure that those actually affected by SRCs are

involved across all phases of research. As such, this dissertation stands as a model for future researchers who are ready to be courageous and answer the call for more diversified and creative methods of inquiry.

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Appendix A: Recruitment Text - Athlete Focus Groups (Phase A)

Rethinking Concussion Support: From Psychological and Social Needs to Leveraging Mental Performance Consultants

Cassandra Seguin, MHK
Doctoral Candidate
Faculty of Health Sciences
School of Human Kinetics
University of Ottawa

Diane M. Culver, PhD
Associate Professor
Faculty of Health Sciences
School of Human Kinetics
University of Ottawa

Hello High-Performance Athletes,

My name is Cassandra Seguin and I am a doctoral candidate at the University of Ottawa in the School of Human Kinetics, supervised by Dr. Diane Culver. This letter is to invite you to participate in a study within my overall doctoral research. This study is focused on learning about the experience of high-performance athletes who have had at least one concussion and/or protracted symptoms (i.e., symptoms that lasted more than 14 days after the concussion incident). This project is part of a larger study focused on the co-development, implementation, and dissemination of a psychological skills training program for concussed high-performance athletes. As a former high-performance athlete who has had multiple concussions, I understand how difficult these experiences can be. With this project, we are hoping to learn more about high-performance athletes' experiences with concussions, so that mental performance consultants (and other sport psychology practitioners) can be better informed to support the psychological and social aspects of the concussion experience that are often overlooked, and hopefully, better support recovery.

As a participant, you will be engaging in the first phase of this doctoral research. Within this important phase, you, the high-performance athlete, can share your experience(s) with concussion(s) you've had in the past. This information will inform the researchers on what psychological and/or social symptoms and experiences need to be addressed in order to help us better support athletes in the future. Specifically, you will be asked to participate in a small focus group (i.e., no more than four athletes per group), to share your experiences. You may also be asked to participate in a single (1) follow-up interview should additional information or clarification be needed. Follow-up questions may also be asked via email, should you prefer this option.

Focus groups will either be held in person (i.e., if you are within driving distance of the University of Ottawa) or over a video conferencing service (i.e., Zoom). If you choose to participate, focus groups will take place at a time and location that is convenient for you, the other athlete(s), and the interviewing researcher. Each focus group will run approximately 30-90 minutes.

Your participation in this research is completely voluntary and you may choose to resign your participation at any point during the study, without consequence. High-performance athletes will be accepted for participation in this research on a first come/first serve basis. This research is

being conducted through the University of Ottawa and is not affiliated with the organizations which have distributed this letter of recruitment. If you are interested in participating in this study and contributing to the fields of sport psychology and concussion management, please contact me so that we may further discuss this exciting opportunity.

Thank you for your time and consideration,

Cassandra Seguin, MHK

Appendix B: Consent Form - Athlete Focus Groups (Phase A)

Rethinking Concussion Support: From Psychological and Social Needs to Leveraging Mental Performance Consultants

Cassandra Seguin, MHK
Doctoral Candidate
Faculty of Health Sciences
School of Human Kinetics
University of Ottawa

Diane M. Culver, PhD
Associate Professor
Faculty of Health Sciences
School of Human Kinetics
University of Ottawa

Invitation to Participate: I have been invited to participate in a research project conducted by Cassandra Seguin and Dr. Diane Culver through the School of Human Kinetics at the University of Ottawa. This study is being conducted as part of Cassandra's doctoral degree requirements.

Purpose of the Study: I understand that the general purpose of the study is to learn about high-performance athletes' experiences with concussions. By learning about my experience and the experiences of other high-performance athletes who have had one or more concussions, the researchers hope to better inform the work of mental performance consultants (e.g., sport psychology practitioners) in their efforts to support high-performance athletes with concussions. Furthermore, my experience will help inform and influence the development of a psychological skills training program for concussed athletes.

Participation: My participation in this study will consist of engaging in one (1) small focus group (i.e., a maximum of four athletes per group) with one of the investigating researchers. Each focus group will run approximately 30-90 minutes, during which I will discuss matters related to my high-performance career and concussion experience(s). This focus group will be audio recorded (with my prior consent) and research notes will be taken during this activity. This focus group will take place at an agreed upon time and location that is convenient for myself, the other athlete(s) who wish/wishes to participate, and the interviewing researcher. Should an in-person option not be convenient, focus groups may take place via a video conferencing service (i.e., Zoom). I may be asked to participate in a follow-up interview should further clarification or information be required. Alternatively, follow-up questions may be asked via email, should I prefer this option. Following my participation, I will be asked to review a transcript of my contributions to the focus group to ensure what was transcribed is an accurate representation of my contributions, experience, etc. I may also be invited to collaborate in data analysis processes to support the dissemination of results.

Assessment of risks: My participation in this study entails very limited foreseeable risks. However, if I experience any discomfort, the interviewing researcher has assured me that she will make every effort to minimize this discomfort. I may decide to stop my participation at any time, without consequence.

Benefits: By participating in this research, I will have an opportunity to share my experiences and engage with others who have also experienced concussions. My participation in this research will also contribute to the fields of sport psychology and concussion management. Specifically,

my participation will help to enhance the current understanding of the concussion experience at the high-performance level. What I share within this study will help inform the work of mental performance consultants (and other sport psychology practitioners), so that they can better support athletes who experience concussions in the future.

Privacy of participants: I have received assurance from the researcher that the information I share during the activity (i.e., focus group) will remain strictly confidential. The content from this and any subsequent discussions will be used for the completion of this doctoral research and other publications for dissemination. I understand that the information discussed during these meetings is to remain confidential. Specifically, only the two researchers listed on this form will have access to the data, and pseudonyms will be used in any publications to ensure anonymity.

Confidentiality and conservation of data: I have been assured that the written recordings and transcripts will be encrypted and kept in a secure manner on a password-protected computer. All physical data will be stored and conserved by the researcher in a locked cabinet. In five years after the completion of this doctoral research project, all material data will be shredded and electronic data will be erased. As I am participating in a focus group, I agree to not share any information about the other athlete(s) in this research. However, due to the group nature of participation, confidentiality cannot be guaranteed.

Voluntary Participation: I am under no obligation to participate and if I choose to participate, I may withdraw from the study at any time and/or refuse to answer any questions, without suffering any negative consequences. If I choose to withdraw, I understand that my contributions made to the point of withdrawal cannot be destroyed, due to the interdependent nature of the data.

Acceptance: I, _____, agree to participate in the above research study conducted by Cassandra Seguin and Diane Culver, PhD, in the School of Human Kinetics, at the University of Ottawa. I am in no way waiving my right to withdraw from this study.

If I have any questions about the study, I may contact Cassandra Seguin.

If I have any questions regarding the ethical conduct of this study, I may contact:

Office of Research Ethics and Integrity
University of Ottawa, Tabaret Hall
550 Cumberland Street, Room 154
Ottawa, ON K1N 6N5
Tel.: (613) 562-5387
Email: ethics@uottawa.ca

There are two copies of the consent form, one of which is mine to keep.

Participant's name:	**Signature:**	**Date:**
Researcher's name:	**Signature:**	**Date:**

Appendix C: Semi-Structured Focus Group Script (Phase A)

1) What sport do/did you compete in?
    a) How long have/did you compete(d) in that sport?
2) How many concussions have you had?
    a) Diagnosed vs. Undiagnosed?
    b) How long did this/these concussion(s) last?
3) What was that/were those experiences like?
    a) (If multiple concussions) Did you experience any similar symptoms or similar experiences across your concussions?
    b) (If multiple concussions) Were there any differences between your experiences?
4) What kind of symptoms did you have?
    a) How long did they last?
    b) Have any symptoms stayed with you?
5) (If it hasn't been answered and multiple concussions) Which concussion would you say most impacted your career?
    a) How did it impact your career?
6) What was the hardest thing about being concussed?
7) Did you have support through your experience(s)?
    a) What kind? (family, friends, team, sports organization, medical, sport psych, etc.)
    b) Did you find any of that helpful?
        i) If so, what support was most helpful?
        ii) If not, what support was least helpful?
    c) Was there any additional support that you wish you had in your rehabilitation/transition process?
8) Have you ever worked on mental skills/sport psychology?
    a) If "yes" – describe?
    b) If "no", what do you know about it?

Present PSTP (Seguin & Durand-Bush, 2019)

9) Do you think this program might have helped you during your concussion experience?
    a) If so, why?
    b) If not, hypothetically, what would need to change in this program for it to have had an effect on you?

Appendix D: Application of Thematic Analysis

Phases of Thematic Analysis	**Phase 1: Familiarization** The primary researcher began by familiarizing herself with the data through a process of reading and noting in an effort to begin engaging with the data analytically.
	Phase 2: Coding The data was coded using a systematic and rigorous scope to identify data at either at the semantic or latent level that was of interest to the research question(s). This process evolved and was refined as a result of the participatory nature of the research. Evolutions required multiple forms and variations of coding from different lenses (e.g., inductive vs. deductive).
	Phase 3: Theme Development The coded data were organized into themes, which fell into clusters of overarching themes, themes, and subthemes that were relevant to the research questions.
	Phase 4: Theme Refinement Theme refinement was a co-operative process whereby themes were discussed by the doctoral candidate and supervisor, in an effort to enable us to tell the story of our research in a coherent and compelling way.
	Phase 5: Theme Defining and Naming The naming of the themes was thoroughly considered, as names of themes needed to be contextualized within concussion research to align with (or redefine) concepts and provide relevant descriptions of each theme (i.e., overarching themes, themes, subthemes) in order to ensure the themes were both representative of the data and were efficiently telling the important stories of the co-researchers.
	Phase 6: Writing the Report This phase of the analysis comprised data reporting across the articles, and was an integral and ongoing part of the research, rather than a step that was completed at the end of the project.

Note. The above was developed based on the work of Braun and colleagues (2016) in order to reflect the phases of thematic analysis that guided the qualitative data analysis of the overall research.

Appendix E: Recruitment Text - MPC Focus Groups (Phase B)

Rethinking Concussion Support: From Psychological and Social Needs to Leveraging Mental Performance Consultants

Cassandra Seguin, MHK
Doctoral Candidate
Faculty of Health Sciences
School of Human Kinetics
University of Ottawa

Diane M. Culver, PhD
Associate Professor
Faculty of Health Sciences
School of Human Kinetics
University of Ottawa

Hello Mental Performance Consultants,

My name is Cassandra Seguin and I am a doctoral candidate at the University of Ottawa in the School of Human Kinetics, supervised by Dr. Diane Culver. This letter is to invite you to participate in a study within my overall doctoral research. This study is focused on learning about the experiences of mental performance consultants (MPCs) who have worked with concussed high-performance athletes (with or without protracted symptoms). This project is part of a larger study focused on the co-development, implementation, and dissemination of a psychological skills training program for concussed high-performance athletes. As a former high-performance athlete who has had multiple concussions, I understand how difficult these experiences can be. Furthermore, as a mental performance consultant, I understand the potential positive impact that we can have on these athletes during this difficult time. With this project, we are hoping to learn more about the needs and experiences of high-performance athletes and MPCs who are confronted with this complex injury. Furthermore, we hope to better inform the work of MPCs in this domain, in order to better support the psychological and social needs of concussed athletes that are often overlooked externally, and hopefully, to better support recovery.

As a participant, you will be engaging in the second phase of this doctoral research. Within this important phase, you, the MPC, will be asked to share your experience(s) working with (a) concussed high-performance athlete(s). This information will inform the researchers on which psychological and/or social symptoms and experiences need to be addressed in order to help us (MPCs) better support athletes in the future. Specifically, you will be asked to participate in a focus group (i.e., no more than four MPCs per group) to share your experiences. You may also be asked to participate in a single (1) follow-up interview should additional information or clarification be needed. Follow-up questions may also be asked via email, should you prefer this option.

Focus groups will either be held in person (i.e., if you are within driving distance of the University of Ottawa) or over a video conferencing service (i.e., Zoom). If you choose to participate, focus groups will take place at a time and location that is convenient for you, the other MPC(s), and the interviewing researcher. Each focus group will run approximately 30-90 minutes.

Your participation in this research is completely voluntary and you may choose to resign your participation at any point during the study, without consequence. MPCs will be accepted for participation in this research on a first come/first serve basis. This research is being conducted through the University of Ottawa and is not affiliated with the organizations which have distributed this letter of recruitment. If you are interested in participating in this study and contributing to the fields of sport psychology and concussion management, please contact me so that we may further discuss this exciting opportunity.

Thank you for your time and consideration,

Cassandra Seguin, MHK

Appendix F: Consent Form - MPC Focus Groups (Phase B)

Rethinking Concussion Support: From Psychological and Social Needs to Leveraging Mental Performance Consultants

Cassandra Seguin, MHK
Doctoral Candidate
Faculty of Health Sciences
School of Human Kinetics
University of Ottawa

Diane M. Culver, PhD
Associate Professor
Faculty of Health Sciences
School of Human Kinetics
University of Ottawa

Invitation to Participate: I have been invited to participate in a research project conducted by Cassandra Seguin and Dr. Diane Culver through the School of Human Kinetics at the University of Ottawa. This study is being conducted as part of Cassandra's doctoral degree requirements.

Purpose of the Study: I understand that the general purpose of this study is to learn about the experiences of mental performance consultants (MPCs) who have worked with concussed high-performance athletes. By learning about my experience working with one or more high-performance athletes who have had a concussion, the researchers hope to gather information to better inform the work of MPCs and other sport psychology practitioners in their efforts to support high-performance athletes with concussions. Furthermore, my experience will help inform and influence the development of a psychological skills training program for concussed athletes.

Participation: My participation in this study will consist of engaging in one (1) small focus group (i.e., a maximum of four MPCs per group) with one of the investigating researchers. Each focus group will run approximately 30-90 minutes, during which I will discuss matters related to my experience and perceptions of working as an MPC with one or more concussed athletes. I will be audio recorded (with my prior consent) and research notes will be taken during this activity. This focus group will take place at an agreed upon time and location that is convenient for myself, the other participating MPC(s), and the interviewing researcher. Should an in-person option not be convenient, focus groups may take place via a video conferencing service (i.e., Zoom). I may be requested to participate in a follow-up interview should further clarification or information be required. Alternatively, follow-up questions may be asked via email, should I prefer this option. Following my participation, I will be asked to review a transcript of my contributions to the focus group to ensure that what was transcribed is an accurate representation of my contributions, experience, etc.

Assessment of risks: My participation in this study entails very limited foreseeable risks. However, if I experience any discomfort, the interviewing researcher has assured me that she will make every effort to minimize this discomfort. I may decide to stop my participation at any time, without consequence.

Benefits: By participating in this research, I will have an opportunity to share my experiences and engage with others who have also worked with concussed athletes. My participation in this research will contribute to the fields of sport psychology and concussion management.

Specifically, my participation will help to enhance our current understanding of the concussion experience at the high-performance level, as well as to understand the experiences and needs of MPCs working with this population. What I share within this study will help inform the work of MPCs, so that they can better support athletes who experience concussions in the future. Additionally, participating in this focus group may serve as a growth opportunity, in that I will be reflecting on my experiences and practice.

Privacy of participants: I have received assurance from the investigating researcher that the information I share during the activity (i.e., focus group) will remain strictly confidential. The content from these discussions will be used for the completion of this doctoral research and other publications for dissemination. I understand that the information discussed during these meetings is to remain confidential. Specifically, only the two researchers listed on this form will have access to the data, and pseudonyms will be used in any publications to ensure anonymity.

Confidentiality and conservation of data: I have been assured that the recordings and transcripts will be kept in a secure manner on a password-protected computer. All physical data will be stored and conserved by the researcher in a locked cabinet. In five years after the completion of the doctoral dissertation, all material data will be shredded, and electronic data will be erased. As I am participating in a focus group, I agree to not share any information about the other MPC(s) in this research. However, due to the group nature of participation, confidentiality cannot be guaranteed.

Voluntary Participation: I am under no obligation to participate and if I choose to participate, I can withdraw from the study at any time and/or refuse to answer any questions, without suffering any negative consequences. If I choose to withdraw, I understand that my contributions made to the point of withdrawal cannot be destroyed, due to the interdependent nature of the data.

Acceptance: I, _____, agree to participate in the above research study conducted by Cassandra Seguin and Diane Culver, PhD, in the School of Human Kinetics, at the University of Ottawa. I am in no way waiving my right to withdraw from this study.

If I have any questions about the study, I may contact Cassandra Seguin.

If I have any questions regarding the ethical conduct of this study, I may contact:

Office of Research Ethics and Integrity
University of Ottawa, Tabaret Hall
550 Cumberland Street, Room 154
Ottawa, ON K1N 6N5
Tel.: (613) 562-5387
Email: ethics@uottawa.ca

There are two copies of the consent form, one of which is mine to keep.

Participant's name:	**Signature:**	**Date:**
Researcher's name:	**Signature:**	**Date:**

Appendix G: Semi-Structured Focus Group Script (Phase B)

1) How long have you been working as an MPC?
2) Is there a population or group that you work with most (e.g., high-performance athletes, musicians, military members)?
3) How did you come to work with high-performance athletes?
    a) (If not the most frequently worked with group) How often have you worked with high-performance athletes?
4) How many concussed athletes have you worked with?
    a) Did you work with them pre-/post- and/or during their concussion(s)?
        i) (Depending on answer) Did you have a working relationship with this/these athlete(s) prior to them becoming concussed?
    b) (If "yes") How long had you been working with this/these athlete(s) prior to their concussion?
    c) (If "no") Did you find this difficult?
        i) How did you build a relationship with them at this time?
5) How often did you meet with this/these athlete(s) (prior to concussion, during concussion, and post-concussion)?
    a) What kind of symptoms did they have?
    b) How long did their symptoms last?
6) What was that/were those experience(s) like?
    a) (If multiple concussions) Did you notice any significant similarities in working with these athletes?
    b) (If multiple concussions) Did you notice any significant differences?
    c) Did this/these athlete(s) fully recover from their concussion?
    d) Did this/these athlete(s) return to sport?
7) (If worked with athlete(s) during concussion) What was your role in the athlete's/athletes' concussion rehabilitation/recovery process(es)?
    a) Were you working alone with the athlete(s) or within a team of professionals (e.g., collaborating with a physiotherapist)?
    b) Did you feel you were effective in your work with this/these concussed athlete(s)?
        i) (If "yes") Why?
        ii) (If "no") Why not?
8) From a mental performance perspective, what was/were the challenge(s) of working with a concussed athlete?
9) What do you believe concussed athletes need during the concussion experience (Prompt examples if needed: e.g., support, specific skills…)?
10) Is there anything you can point to in your work that you viewed as significantly helpful in working with this/these athlete(s)?
    a) Helpful to the athlete(s).
    b) Helpful for you as the MPC.

11) What information did you have that informed your work with this/these athlete(s) around their concussion(s)?
    a) Where did you learn about this?
    b) Did you find it helpful?
    c) Is there information or a tool or something else that you believe would have benefited your work with this/these concussed athlete(s)?
12) Have you worked with athletes or other high-level performers during injuries?
    a) (If "yes") Do you feel that there are similarities between these experiences?
        i) Do you feel that there are any differences between these experiences?
        ii) If anything, what did you apply with your concussed athlete(s) that you use with athletes (or other high-performers) with other types of injuries?
13) What do you feel is of utmost importance in working with injured athletes?
14) What do you feel is of utmost importance in working with concussed athletes?
15) What do you feel you would need to be the most effective in working with concussed athletes?

Present PSTP (Seguin & Durand-Bush, 2019)

16) Do you think this program or something similar might help you work with concussed athlete(s)?
    a) If so, why?
    b) If not, hypothetically, what would need to change in this program to better meet the needs you feel concussed athletes have, in your experience?
    c) If not, hypothetically, what would need to change in this program for it to meet your needs as an MPC?

Appendix H: Recruitment Text - MPC CoP (Phase C)

Rethinking Concussion Support: From Psychological and Social Needs to Leveraging Mental Performance Consultants

Cassandra Seguin, MHK
Doctoral Candidate
Faculty of Health Sciences
School of Human Kinetics
University of Ottawa

Diane M. Culver, PhD
Associate Professor
Faculty of Health Sciences
School of Human Kinetics
University of Ottawa

Hello Mental Performance Consultants,

My name is Cassandra Seguin and I am a doctoral candidate at the University of Ottawa in the School of Human Kinetics, supervised by Dr. Diane Culver. This letter is to invite you to participate in a study within my doctoral research. This study is focused on the creation and use of a community of practice (CoP) designed to collaboratively discuss the needs of concussed high-performance athletes. Within this CoP, we will co-develop a psychological skills training program (PSTP) for mental performance consultants (MPCs) to use with concussed high-performance athletes. Specifically, this PSTP will be used to help inform the work of MPCs in order to support psychosocial aspects of the concussion experience and ultimately, recovery. As a former high-performance athlete who has had multiple concussions, I understand how difficult these experiences can be. Furthermore, as a mental performance consultant, I understand the potential positive impact that we can have on these athletes during this difficult time. With this project, we are hoping to co-develop and provide better tools for supporting the psychosocial aspects of concussions.

As a participant, you will be engaging in three (3) or four (4) sessions over a period of six to eight weeks via an internet-based sharing space (i.e., Basecamp) and a video conferencing service (i.e., Zoom). Within this community of practice, we will regularly and openly discuss thoughts and perspectives on data generated from focus groups with formerly concussed high-performance athletes and with MPCs who have worked with concussed high-performance athletes. We will also discuss an existing PSTP which has been developed specifically for this population, in order to modify, expand, and/or further develop it to meet the needs of both athletes and MPCs. Furthermore, discussions will center on existing literature and barriers MPCs and athletes might face with regard to the PSTP's delivery, acceptance, and enactment.

If you choose to participate, each session will take place at a time that is most convenient for the community. Each session will run approximately 60-90 minutes. Additional information (e.g., concussion resources) will be available for online discussion throughout the six to eight weeks of this phase of the research via Basecamp.

Your participation in this research is completely voluntary and you may choose to resign your participation at any point during the study, without consequence. For this phase of the research, we are seeking MPCs who have worked with one or more concussed and/or injured athletes during their rehabilitation. Those who have worked with concussed high-performance athletes

will be prioritized, but MPCs will be accepted for participation in this research on a first come/first serve basis. This research is being conducted through the University of Ottawa and is not affiliated with the organizations which have distributed this letter of recruitment. If you are interested in participating in this study and contributing to the fields of sport psychology and concussion management, please contact me so that we may further discuss this exciting opportunity.

Thank you for your time and consideration,

Cassandra Seguin, MHK

Appendix I: Consent Form - MPC CoP (Phase C)

Rethinking Concussion Support: From Psychological and Social Needs to Leveraging Mental Performance Consultants

Cassandra Seguin, MHK
Doctoral Candidate
Faculty of Health Sciences
School of Human Kinetics
University of Ottawa

Diane M. Culver, PhD
Associate Professor
Faculty of Health Sciences
School of Human Kinetics
University of Ottawa

Invitation to Participate: I have been invited to participate in a research project conducted by Cassandra Seguin and Dr. Diane Culver through the School of Human Kinetics at the University of Ottawa. This study is being conducted as part of Cassandra's doctoral degree requirements.

Purposes of the Study: I understand that the general purpose of the study is to collaboratively discuss, build upon, and modify an existing psychological skills training program (PSTP) designed to support concussed athletes. This will be done through the creation of a community of practice (CoP) for mental performance consultants (MPCs) who have and/or currently work with high-performance athletes.

Participation: My participation in this study will involve participating in three (3) or four (4) community of practice sessions over a period of six to eight weeks. Along with the other MPCs who elect to participate, and the researchers involved in this project, we will discuss the findings from two earlier phases in this doctoral research project, and openly share thoughts, perspectives, and expertise regarding the needs of concussed high-performance athletes. This discussion and collaboration will be conducted through a video conferencing service (i.e., Zoom) and through an online sharing space (i.e., Basecamp). I also will be provided with select resources on sport-related concussions during this phase of the study, which I will be able to discuss within the CoP. Additionally, I will be asked to contribute to the further conceptualization of an existing PSTP for concussed high-performance athletes to meet their psychological and social needs, as well as to discuss barriers to program acceptance and delivery. Video recordings of the research activities (i.e., CoP proceedings) will be used as a data generation instrument. However, these videos will also be used to enable access to those within the CoP, should a participant be unable to attend the activity at the time it is held. Thus, a participant within the CoP may access the video at a time that is convenient to them.

Assessment of risks: My participation in this study entails very limited foreseeable risks. However, if I experience any discomfort, the primary researcher has assured me that she will make every effort to minimize this discomfort. I may decide to stop my participation at any time, without consequence.

Benefits: My participation in this research will contribute to the fields of sport psychology and concussion management. Specifically, my participation will help to enhance our current understanding of the concussion experience at the high-performance level, as well as to understand the experiences and needs of MPCs working with this population. My opinions,

experience, and expertise shared within the CoP will enhance our current understanding of the concussion experience and contribute to the conceptualization of a PSTP designed to support the psychological and social needs of concussed high-performance athletes. Additionally, participating in this community of practice may serve as a personal growth opportunity, in that I will be critically reflecting on my experiences and practice. I will also be able to network with other professionals working within the high-performance sport, consulting, and concussion domains, as well as access relevant and up-to-date information on sport-related concussions.

Privacy of participants: I have received assurance from the researcher that the information I share during the activities (i.e., video/audio conferencing and online discussions) will remain confidential. As a participant in this community of practice, I agree to not share any information or details pertaining to the proceedings of the community or its members without their explicit permission. The content from these community of practice discussions will be anonymized and used for the completion of this doctoral research and other publications for dissemination. I understand that the information discussed during these meetings is to remain confidential, unless explicitly stated otherwise. However, due to the participatory nature of the CoP, confidentiality cannot be guaranteed.

Confidentiality and conservation of data: I have been assured that the video/audio recordings and transcripts will be kept in a secure manner on a password-protected computer. All physical data will be stored and conserved by the researchers in a locked cabinet. In five years following the completion of all data generation for this project, all material data will be shredded, and electronic data will be erased.

Voluntary Participation: I am under no obligation to participate and if I choose to participate, I may withdraw from the study at any time and/or refuse to partake in any discussions, without suffering any negative consequences. If I choose to withdraw, I understand that my contributions made to the point of withdrawal cannot be destroyed, due to the interdependent nature of the data.

Acceptance: I, _____, agree to participate in the above research study conducted by Cassandra Seguin and Diane Culver, PhD, in the School of Human Kinetics, at the University of Ottawa. I am in no way waiving my right to withdraw from this study.

If I have any questions about the study, I may contact Cassandra Seguin.

If I have any questions regarding the ethical conduct of this study, I may contact:

Office of Research Ethics and Integrity
University of Ottawa, Tabaret Hall
550 Cumberland Street, Room 154
Ottawa, ON K1N 6N5
Tel.: (613) 562-5387
Email: ethics@uottawa.ca

There are two copies of the consent form, one of which is mine to keep.

Participant's name:	**Signature:**	**Date:**

Researcher's name:	**Signature:**	**Date:**

Appendix J: Value Creation Story Template (Phase C)

		Your story:
1.	**<u>Activity</u>**: Describe a meaningful activity you participated in and your experience of it (e.g., a conversation, a working session, a presentation)	
2.	**Output**: Describe a specific resource this activity produced for you (e.g., an idea or document) and why you thought it might be useful.	
3.	**<u>Application</u>**: Describe how you used this resource in your practice and what it enabled that would not have happened otherwise.	
4)	**Outcome**: a) **Personal**: Explain how it affected your success (e.g., being a better MPC, job satisfaction) b) **Organizational**: Has your participation contributed to the success of your team/organization (e.g., approaches they use)	
5.	**New definition of success**: Sometimes, such a story changes your understanding of what success is. If it happened this time, then include it here.	

Note. A version of the value creation story template above (with additional fillable space), was adapted from Wenger et al. (2011, p. 47), and sent to MPC co-researchers to explore their value creation stories during and after the CoP.

Appendix K: Personal Value Narrative Template (Phase C)

	How participation is changing **me as a professional** (e.g., skills, attitude, identity, self-confidence, feelings)	How participation is affecting **my social connections** (e.g., number, quality, frequency, emotions)	How participation is helping **my professional practice** (e.g., ideas, insights, material, procedures)	How participation is changing **my ability to influence** my world as a professional (e.g., voice, contribution, status, recognition)
Reasons for participation (e.g., challenges, aspirations, professional development goals, meeting people)				
Activities, outputs, events, networking (e.g., meeting material, discussion, guest speakers)				
Value to me (e.g., being a better professional, handling difficult situations, improving organizational performance)				

Note. The personal value narrative template, adapted from Wenger et al. (2011, p. 44), is modifiable and was sent to MPC co-researchers to explore their personal narratives. Follow-up probe questions were provided when additional information and/or clarity was desired.

Appendix L: Application of Content Analysis

Phases of Qualitative Content Analysis	**Phase 1: Familiarization** The doctoral candidate began by familiarizing herself with the data by watching the video recording of the CoP meeting and reviewing her reflective journal from that meeting.	**Example from Analysis** Meeting 8 Video review: listening to discussion, review, and feedback on existing PSTP
	Phase 2: Coding Notes were taken during the review of the audio recording of the meeting, whereby the doctoral candidate noted semantic and/or latent meaning that was of interest to the group's goal of disseminating information on concussion support to MPCs. Similarly, sections of the reflective journal were highlighted and coded as well.	"I think monitoring progress is huge [...] I had a client recently who said 'I'm now at a 5 or 6', and I responded 'do you realize you used to be a 9 before?' He had forgotten because he wasn't tracking" (MPC, Meeting 8) - Coded as: "Importance of tracking/monitoring symptom experiences and trajectories"
	Phase 3: Categorization The codes from Phase 2 were then organized into categories, which helped connect codes around similar context and/or meaning.	"MPC-Athlete engagement" & "Recovery process"
	Phase 4: Category Definition & Refinement Theme refinement was a co-operative process whereby themes were discussed by the doctoral candidate and supervisor, in an effort to enable us to tell the story of our research in a coherent and compelling way.	"MPC's scope of practice" "Phase of injury"
	Phase 5: Writing the Article This phase involved sharing the categories with the co-researchers and collectively writing Article 3 with the categories as our guide.	

Note. The above table was developed based on the work of Hsieh & Shannon (2005) and White & Marsh (2006). An example is depicted on the right for the reader to visualize how the content analysis process was applied to the recordings from Phase C.

Appendix M: Value Creation Questions to Support Thematic Analysis (Phase C)

Value Cycle	Key Questions That Informed Analysis
Immediate Value	***What happened and what was my experience of it?*** *What were significant events?* (What happened? How much participation was there? What was the quality of the mutual engagement? Was it fun, inspiring, convivial? How relevant to me was the activity/interaction? With whom did I interact or make connections? Which connections are most influential on my own development?)
Potential Value	***What has all this activity produced?*** *How has my participation changed me?* (Have I acquired new skills or knowledge? Has my understanding of the domain or my perspective changed? Do I feel more inspired by the work I do? Have I gained confidence in my ability to engage in practice? *How has my participation changed my social relationships?* (What access to new people have I gained? Do I know them well enough to know what they can contribute to my learning? Do I trust them enough to turn to them for help? Do I feel less isolated? Am I gaining a reputation from my participation?) *What access to resources has my participation given me?* (Do I have new tools, methods, or processes? Do I have access to documents or sources of information I would not have otherwise?) *What position has the community acquired?* (Has the community changed the recognition of our expertise? Have we acquired a new voice through our collective learning?) *How has my participation transformed my view of learning?* (Do I see opportunities for learning that I did not see before? Do I now see opportunities for convening a community of practice or network in the service of learning that I did not see before?)
Applied Value	***What difference has it made to my practice/life/context?*** (Where have I used the products of the community/network? Where did I apply a skill I acquired? When did I leverage a community/network connection in the accomplishment of a task? Was I able to enlist others in pursuing a cause I care about? When and how did I use a document or tool that the community produced or made accessible? How was an idea or suggestion implemented? At what level – individual, team/unit, organization?)
Realized Value	***What difference has it made to my ability to achieve what matters to me or other stakeholders?*** (What aspects of my performance has my participation in the CoP/network affected? Did I save time or achieve something new? Am I more successful generally? How? What effect did the implementation of an idea have? Did any of this affect some metrics that are used to evaluate performance? What has my organization been able to achieve because of my participation in the CoP/network?)

Transformative Value	***Has it changed my or other stakeholders' understanding and definition of what matters?*** (Has the process or social learning led to a reflection on what matters? Has this changed someone's understanding of what matters? Does this suggest new criteria and new metrics to include in evaluation? How has this new understanding affected those who have the power to define criteria of success? Has this new understanding translated into institutional change? Has a new framework or system evolved or been created as a result of this new understanding?
Strategic Value	***Has the community been directly connected to the strategic imperative?*** (Should the community be part of strategic conversations? What conditions are needed for these strategic conversations to take place? Have these strategic conversations taken place? What are the indicators that would suggest this is either desirable or happening? What kind of data was collected to assess the level of strategic engagement?)
Enabling Value	***Have you received the support you would ideally need?*** (What enabling factors were secured? Under what conditions was the support available? Was the right level of support available? Was this support evident? Has it been on-going?)
Orienting Value	***Reach beyond the learning space and its stakeholders, taking into account the broader landscape; orienting towards the landscape*** *Internal and external orienting values* Internal orienting (e.g., participants immersed in context relaying back to group; joint timeline integration of participant stories) External orienting (e.g., honouring and recognizing previous work; preparing resources for those external to the social learning space; inviting external experts to contextualize experiences)

Note. The eight value creation cycles are noted, along with key questions documented by both Wenger and colleagues (2011) and E. Wenger-Trayner and Wenger-Trayner (2015). In addition, key postulates of each cycle are noted in some instances based on the most recent publication of the updated VCF (E. Wenger-Trayner & Wenger-Trayner, 2021). These questions and postulates were used to explore each cycle as experienced by the co-researchers. In particular, these were used during the analysis of the value creation stories and personal value narratives to better understand the value each co-researcher gained from participating in this research project.