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Examining the role of identity following a sport-related concussion among elite athletes

By

Cameron B. Collict

École de kinésiologie et des sciences de l'activité physique, Faculté de médecine

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Examining the role of identity following a sport-related concussion among elite athletes

Presented by

Cameron B. Collict

Evaluated by a jury composed of the following people

Dr. Jason Neva
Président-rapporteur

Dr. Jeffrey Caron
Directeur de recherche

Dr. Mark Eys
Membre du jury

Résumé

Les perturbations de l'identité suite à une commotion cérébrale liée au sport (CCS) ont été explorées du point de vue de l'identité athlétique. Cependant, ces études négligent d'autres constructions identitaires importantes, comme l'identité personnelle (p.ex. la personnalité, les émotions) et sociale (p. ex. la famille) ainsi que le concept de soi, c'est-à-dire l'identité collective, personnelle et sociale. En utilisant l'approche de l'identité sociale pour conceptualiser le concept d'identité, cette étude qualitative multiméthodes a exploré l'impact d'une CCS sur les constructions identitaires de sept athlètes élites *(n* = 6 femmes, *M* = 25,1 ans). Deux entretiens semi-structurés (durée moyenne de 83,7 minutes et 76,9 minutes respectivement) et l'outil nommé *Social Identity Mapping Tool* ont été utilisés pour collecter les données. Suite à une analyse thématique réflexive, trois thèmes ont été développés. Thème A : L'impact de la CCS durant le rétablissement sur les constructions identitaires des participants menace le concept de soi. Le thème B : L'identité post-commotion décrit comment les constructions identitaires des participants ont changé après le rétablissement de la CCS. Le thème C : La gestion de l'identité via l'identité sociale explique comment les dynamiques du réseau social des participants impactent leurs constructions identitaires. Les résultats démontrent que les athlètes élites ayant subi une CCS peuvent éprouver une perturbation allant au-delà de l'identité athlétique. Les futures recherches devraient explorer les interventions nécessaires afin de gérer adéquatement cette perturbation de l'identité.

Mots-clés: commotion cérébrale liée au sport, athlètes d'élite, approche de l'identité sociale, méthodes qualitatives, outil de cartographie de l'identité sociale, blessure sportive, identité athlétique

Abstract

Researchers have explored the impact of a sport-related concussion (SRC) on athletes' identity almost exclusively through the lens of athletic identity. However, this approach neglects other important identity constructs, such as personal (e.g., personality, emotions), and social identity (e.g., family, student), and the self-concept (i.e., collectively, personal, and social identity). Using the Social Identity Approach, this qualitative, multi-method study explored the impact of SRC on the identity constructs of seven (n = 6 female, M = 25.1 years) elite soccer, swimming, ice hockey, and curling athletes. We collected data using two semi-structured interviews (M_{time} = 83.7 and 76.9 minutes, respectively). The second interview included the Social Identity Mapping Tool, a comprehensive visual display of individuals' social identity and social network. We used a reflexive thematic analysis and organized the data into three themes. *SRC Experience Threatening the Self-Concept* (Theme A) explored disruption to participants' identity constructs during SRC recovery. *Post-Concussion Identity* (Theme B) described how participants' identity constructs changed when recovered. *Identity Management Through Social Identity* (Theme C) explained how the dynamics of participants' social identity impacted disruptions to identity constructs throughout the SRC experience. Results highlight that elite athletes with SRCs may encounter identity disruption that extends beyond merely their athletic identity. Although this study expands the knowledge around identity disruption from SRCs, we suggest future research explore potential intervention strategies for managing identity disruption from SRCs.

Keywords: sport-related concussion, elite athletes, Social Identity Approach, qualitative methods, Social Identity Mapping Tool, sports injury, athletic identity

Table of Contents

List of Figures and Tables

List of Signs and Abbreviations

In the order that they appear in text:

CISG: Concussion in Sport Group

SRC: Sport-related concussion

Psychosocial: Psychological and social

AIMS: Athletic Identity Measurement Scale

CC: Cameron Collict, 1st author

SIM: Social Identity Mapping Tool

JC: Dr. Jeffrey Caron, 2nd author

Dedications

This thesis is dedicated to my friends and family. There truly are no words to fully express my gratitude towards everything that you all have done for me. Thank you for your continuous support, especially in the moments when I needed it the most. I am forever grateful for all the love, wisdom, and guidance you have all provided me over the years. I wouldn't have grown into the person I am today without you.

I would also like to dedicate this thesis to all of those who have experienced and continue to suffer from the consequences of a concussion. Thank you to the athletes who shared their story with me. I hope this work has helped you feel understood and that it has helped us move in the right direction to better care and support for concussed individuals.

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Preface

This Master thesis is separated into three chapters. Chapter 1 provides a review of present knowledge surrounding sport-related concussions and identity within sport psychology literature. This chapter also includes the contemporary knowledge of the Social Identity Approach as well as the research questions and objectives for this thesis. Chapter 2 is a manuscript that presents results and discussion of this study. Chapter 3 concludes the thesis with a brief summary and offers some suggestions for future research.

Chapter 1

Introduction and Literature Review

Chapter 1 of this thesis is divided into three subsections. First, we introduce sport-related concussions (definition, incidence, and common signs and symptoms) before describing the psychological and social implications of this injury, with an emphasis on the impact to athletes' identity. Second, we define identity and the self-concept as well as describe research conducted on these topics in social psychology. Third, we describe the Social Identity Approach, including the two underlying theoretical perspectives, Social Identity Theory and Self-Categorization Theory, and explain why we believe the Social Identity Approach offers a more comprehensive framework to study identity disruptions that can stem from sport-related concussions.

Sport-Related Concussions

The first attempt at defining a "concussion" can be traced back to the 10th century by an Arabic physician, Rhazes (McCrory & Berkovic, 2001). Since this initial definition, countless descriptions of concussions have been produced (Gasquoine, 2020; McCrory & Berkovic, 2001), leading to a proliferation of concussion knowledge and further refinement of existing definitions (Casper, 2018). Definitions of a concussion have also been forwarded by major healthcare and medical groups (e.g., Centres for Disease Control and Prevention; CDC, 2020), governments (e.g., Canadian Government; Public Health Agency of Canada, 2018), national sports committees (e.g., National Hockey League Public Relations; National Hockey League Public Relations, 2016), and various clinicians and researchers (Gasquoine, 2020). Taken together, there are currently multiple operational definitions of a concussion with no universally accepted definition at this time (Hainline & Ellenbogen, 2017; Halstead et al., 2018; Voss et al., 2015).

In the 1990s and early 2000s, health professionals were becoming increasingly concerned with concussions in sport, as it was clear that concussions had become a prominent injury (Gasquoine, 2020; Kazl & Torres, 2019). It was also apparent that there was a need to develop a sport-specific definition of this injury (Gasquoine, 2020). In 2001, the International Ice Hockey Federation, the Fédération Internationale de Football Association, the International Olympic Committee, and various clinicians, scientists, and researchers identified this need and formed the Concussion in Sport Group (CISG), which has held five total meetings since 2001 with a 6th planned for October 2022 (Aubry et al., 2002; McCrory et al., 2005, 2009, 2013; McCrory, Meeuwisse, et al., 2017). The CISG is comprised of leading clinicians, scientists, and researchers with expertise in fields such as neurology, neurosurgery, neuropsychology, sports medicine, epidemiology, physiotherapy, athletic therapy, among others. For over two decades, the CISG has provided recommendations for *sport-related concussion* (SRC) evaluation and management, including the widely used Sport Concussion Assessment Tool (Aubry et al., 2002; McCrory, Meeuwisse, et al., 2017).

The CISG's recommendations are widely considered the "gold standard" for SRC management, which includes the most frequently cited organizational definition of SRC (Gasquoine, 2020; McCrory, Meeuwisse, et al., 2017; Pusateri et al., 2018). The CISG defines SRC as a type of traumatic brain injury induced by biomechanical forces (e.g., contact with another player, equipment, the playing field) resulting in a multitude of clinical signs and symptoms (McCrory, Feddermann-Demont, et al., 2017). Additionally, SRC can be resultant of direct contact to the head, but can also occur with indirect contact to the body containing an impulsive force towards the head (McCrory, Meeuwisse, et al., 2017; O'Connor et al., 2017).

Due to the CISG's expert group of allied health professionals, we have chosen to inform our understanding of SRCs through the CISG's consensus statements.

Incidence of Sport-Related Concussions

Sport participation is associated with individuals' health and well-being. Despite this, engaging in sport places individuals at a higher risk of injury (Biese et al., 2019; Hootman et al., 2002; Post et al., 2017), including SRCs (Kazl & Torres, 2019). For instance, in Canada, almost 50% of the estimated 38 million residents, 12 years of age or older, report being physically active for at least 150 minutes per week (Statistics Canada, 2017). Among those who are physically active, 25% of Canadians indicate regular participation in sport (Statistics Canada, 2019). Resultingly, approximately 66% of adolescents and 33% of adults involved in sports experience some form of sport-related injury in Canada each year (Billette & Janz, 2011). In particular, SRC is a prominent sport injury that has incidence rates as high as 1,153 per 100,000 residents within some Canadian provinces (Langer et al., 2020). In fact, in sports such as rugby, ice hockey, and ringette, SRCs comprise as many as 44% of all reported injuries (Public Health Agency of Canada, 2020).

Researchers have found higher incidence rates of SRCs in high contact (e.g., soccer, basketball) and collision (e.g., American football, ice hockey, rugby) team sports when compared to non-contact sports (e.g., swimming, track and field, cross country; Gardner et al., 2019; Kerr et al., 2019; Zuckerman et al., 2015). For example, the incidence rate of SRCs in male American football was found to be as high as 35.82 per 10,000 athletic exposures[1], whereas male track and field athletes displayed an incidence rate of 0.40 per 10,000 athletic exposures (Kerr et al., 2019). Incidence of SRCs also differs based on sex, age, and level of competition

[1] One athletic exposure is equivalent to one athlete participating in one practice, competition, or performance (CDC, 2006).

(Marshall et al., 2015; Pfister et al., 2016; Theadom et al., 2020; Zuckerman et al., 2015). For instance, researchers have found that female athletes experience higher incidence rates of SRCs in comparison to males in sex-matched sports (Cheng et al., 2019; Covassin et al., 2018). In some studies, researchers have even found that females are almost 2.5 times more likely to sustain SRC in sex-matched sports (Kerr et al., 2019). However, although female and male athletes seem to possess similar concussion-related knowledge, researchers have found that males were 4 to 11 times more likely to not report a concussion for reasons that included not wanting to upset/disappoint their parents or coach, thinking they will let their teammates down, and thinking they will be viewed as weak by their teammates (Wallace et al., 2017). Differences in SRC incidence rates can also occur between ages with adults and adolescents (e.g., ≥18 years of age) displaying higher rates of SRCs in contrast to children and youth (Langer et al., 2020; Tsushima et al., 2019). Finally, university and college athletes have been found to experience higher incidence rates of SRCs when compared to high school and youth athletes (Dompier et al., 2015). Taken together, understanding the incidence rate of SRCs requires careful consideration of a number of variables, including type of sport, sex, age, and level of competition, and there is evidence that incidence rates of SRCs are evolving over time.

Between 1988 and 2014, data from the National Collegiate Athletic Association revealed an increase in the SRC incidence rate in American football from 0.32 to 1.36 per 1000 athletic exposures (Dick et al., 2007; Hootman et al., 2007; Houck et al., 2016). In the National Hockey League, there has been an increase in reported SRCs since the 1986-1987 season to the 2011-2012 season with approximately 0.42 to 4.88 concussions per 100 games (Kuhn & Solomon, 2015). Furthermore, in a recent study exploring the surveillance of injuries in the English Premiership Rugby League, the incidence of SRCs increased from approximately 6.0 to 21.0 per

1000 player-match hours between the 2002-2003 and 2018-2019 seasons (West et al., 2020). Also, over the seasons between 2008 to 2017 in the English Premier League and Major League Soccer, the SRC incidence rates increased from approximately 16.0 to 25.0 and 6.0 to 37.0 per 1000 athletic exposures, respectively (Ramkumar et al., 2019). Although the abovementioned examples would appear to demonstrate that incidence rates of SRCs are increasing in the aforementioned sports (Gardner et al., 2019), it is unclear if the statistics reflect better awareness of this injury (and thus better identification and diagnosis) or an actual increase in the incidence of SRCs. In any case, the available statistical trends have helped warrant scholars to explore the etiology and signs and symptoms of SRCs in more detail.

Sport-Related Concussion Symptoms

As noted by the CISG, athletes who suffer SRC often experience signs and symptoms rapidly after impact (McCrory, Meeuwisse, et al., 2017). In the most recent consensus statement, the CISG noted that signs and symptoms of SRCs can include one or more of the following domains: *somatic* (e.g., headache, nausea, tinnitus; Mullally, 2017), *cognitive* (e.g., memory deficits, decreased reaction time, "feeling in a fog"; Sandel et al., 2017), *emotional* (e.g., mood disturbances, impulsivity, aggression; Covassin et al., 2017; Rice et al., 2018), *physical* (e.g., loss of consciousness, balance disturbances; Teel et al., 2017), and *sleep disturbances* (Murdaugh et al., 2018). SRC signs and symptoms are typically a result of a functional disturbance in the brain; physical abnormalities within brain structure are not usually detected on standard medical imaging techniques (e.g., computed tomography, magnetic resonance imaging; Bigler, 2018; McCrory, Meeuwisse, et al., 2017). Also, SRC symptom resolution is commonly observed within 2-weeks in adults (Leddy et al., 2017; McCrory, Meeuwisse, et al., 2017) and 1-month in children and youth (Halstead et al., 2018; Purcell et al., 2016).

Despite extensive research on SRC symptomatology, this remains a complex topic in SRC literature. This is due, in part, to the non-specific, heterogeneity of symptoms and variability in severity between individuals (Feddermann-Demont et al., 2017; Hobbs et al., 2016; Kenzie et al., 2017). First, obvious signs of SRC (e.g., loss of consciousness, gross gait disturbances) are often not present following the acute injury, which can result in SRCs being overlooked (Buchler & Boublik, 2020). Second, while the majority of concussed individuals present symptoms immediately following SRC, some individuals can develop symptoms over the course of hours to days following acute injury (McCrory, Meeuwisse, et al., 2017; Olson et al., 2020). Third, unlike other musculoskeletal injuries (e.g., sprains, tears, fractures), athletes who experience SRCs are not given a clear timeline for recovery (Collins et al., 2016). In fact, approximately 20% of adults and 30% of children and youth experience protracted symptoms past the typical 2-week and 1-month recovery timeframe, respectively (Asken et al., 2018; Davis et al., 2017; Kontos, Elbin, et al., 2019; Makdissi et al., 2017; Zemek et al., 2016).

A considerable amount of concussion literature has begun to explore the long-term sequelae and impact of prolonged recovery/protracted symptoms of SRCs (Manley et al., 2017). Researchers have found when SRC is improperly managed or untreated entirely, symptoms may last months to years past the initial impact and can be detrimental to athletes' future health (André-Morin et al., 2017; Caron et al., 2013; Meehan et al., 2013). More specifically, researchers have found that individuals with a history of concussions have decreased long-term cognitive functioning, worse psychomotor performance, and more atrophy in brain structures when compared to individuals without a history of concussions (Brush et al., 2018; Cunningham et al., 2020; Leddy et al., 2017; Sicard et al., 2018). Changes in brain chemistry and early signs of neurodegenerative conditions (e.g., Alzheimer's, Dementia) have also been reported in those

who have previously experienced SRCs (Koerte et al., 2015; McKee et al., 2013; Mez et al., 2017). Furthermore, athletes experiencing protracted SRC symptoms have reported feelings of isolation, mood/emotional disturbances, frustrations with stagnant recovery, and psychological distress from lifestyle changes (André-Morin et al., 2017; Bloom et al., 2020; Caron et al., 2013, 2017; Dean, 2019). Collectively, these findings highlight the potential impact of protracted symptom recovery on athletes' biological, psychological, and social health and well-being (Buchler & Boublik, 2020; Gardner et al., 2019; Resch et al., 2016; Sufrinko et al., 2017).

Psychosocial Implications of a Sport-Related Concussion

Research on SRCs has focused primarily on the cognitive and physical symptoms, leading to less attention being afforded to the psychological and social (i.e., psychosocial) implications (Bloom et al., 2020; Kontos, 2017). Consequently, it is generally accepted that physical symptoms, more precisely headaches, are the most commonly reported and/or present the largest concern in concussed individuals (Ashina et al., 2019). However, in a recent study by Kontos, Sufrinko, et al. (2019), they discovered that athletes reported psychosocial implications as approximately the same level of concern. More specifically, the authors compared the clinical profiles in 236 concussed individuals and found that their primary concern with their SRC was headaches (n = 61 or 26% of patients), followed by psychosocial symptoms (n = 56 or 24% of patients), such as mood and emotional disturbances (Kontos, Sufrinko, et al., 2019). Other researchers have also reported that athletes experienced psychosocial symptoms within both short- (Covassin et al., 2017) and long-term (Caron et al., 2013) recoveries. Thus, there appears to be a need for further research in this area of study (Bloom et al., 2020; Covassin et al., 2017; Valovich McLeod et al., 2017; Wilmoth et al., 2019).

There has been more attention afforded to psychosocial aspects of SRCs in recent years (Bloom et al., 2020). Some of the investigated topics within this new area of study have included *mood and emotional disturbances* (Carlson et al., 2020; Grubenhoff et al., 2016; Rice et al., 2018; Yrondi et al., 2017), *pressure* (Kroshus, Garnett, et al., 2015), and *feelings of isolation* (André-Morin et al., 2017; Caron et al., 2017). For example, Kroshus, Garnett, et al. (2015) explored the pressures that athletes experience when recovering from SRC, especially the pressure to return to sport. Kroshus, Garnett, et al. (2015) surveyed a sample of United States collegiate athletes with respect to their concussion reporting behaviour and perceived pressure from coaches, teammates, fans, and parents. Results indicated that more than 25% of athletes experienced pressure to continue to play after a head impact from one of these sources, more sources of pressure were associated with the lowest reporting intention group, and approximately 50% indicated playing with symptoms of a potential concussion (Kroshus, Garnett, et al., 2015). Researchers have also found that concussed athletes may experience a sense of isolation from their social network as a result of being removed from their sport environment (André-Morin et al., 2017; Caron et al., 2017). In the André-Morin et al. (2017) study, the research team examined the challenges associated with prolonged SRC recovery and the factors that impeded or facilitated recovery. Among the results, athletes mentioned that being isolated from their sport and social environment was a challenging aspect of their recovery and it significantly impacted their emotional and behavioural response to their SRC recovery (André-Morin et al., 2017).

Athletic Identity and Sport-Related Concussions. Another emerging area related to the psychosocial implications of SRCs is athletic identity disruption (Caron et al., 2017, 2021; Dean, 2019; Engström et al., 2020; Kroshus, Kubzansky, et al., 2015). However, to better understand and interpret the results of these studies, it is important to first clarify the conceptualization of

"identity" within these studies. In the early 1990s, sport psychology researchers became interested in the concept of *athletic identity* (Brewer et al., 1993; Ronkainen et al., 2016). Athletic identity is defined as "The degree to which an individual identifies with the athlete role, within the framework of a multidimensional self-concept" (Brewer et al., 1993, p. 273). Brewer and colleagues (1993) were one of the first researchers to conceptualize and study athletic identity and are credited for developing the Athletic Identity Measurement Scale (AIMS). This 10-item questionnaire included questions and statements regarding athletic identity, such as: "I consider myself an athlete," "Sport is the most important part of my life," and "I feel bad about myself when I do poorly in sport" (Brewer et al., 1993). The AIMS is scored on a 7-point Likert scale from 1 (*strongly disagree*) to 7 (*strongly agree*). Higher reported scores on the AIMS suggests a stronger and more exclusive identification with the athlete role (Brewer et al., 2010; Brewer & Cornelius, 2001). This conceptualization of athletic identity has been applied to topics, including *career transitions* (Sanders & Stevinson, 2017; Stambulova & Samuel, 2020), *participation in sport* (Lamont-Mills & Christensen, 2006; Tasiemski & Brewer, 2011), and *sport injury* (Petrie et al., 2013; Podlog et al., 2011). As such, Brewer and colleagues' (1993) theoretical conceptualization and definition of athletic identity continues to be the dominant framework to study identity in sport (Renton et al., 2021; Ronkainen et al., 2016).

Perhaps unsurprisingly, the limited research that has been conducted on identity following SRC has been largely conceptualized through the lens of athletic identity (Caron et al., 2021; Dean, 2019; Engström et al., 2020). Dean (2019) conducted a qualitative autoethnography of their own SRC experience, where they described significant events, thoughts, and behavioural consequences of their SRC recovery. Throughout Dean's recovery, Dean stated that they felt they had to put on a "mask" when interacting with other individuals to uphold their "normal,

healthy, able-bodied" athletic identity (Dean, 2019, p. 25). Dean also explained that during their SRC experience their identity as a lacrosse player (i.e., athletic identity) was lost and their future sense of self was at the doctor's discretion. Although Dean stated they were given extensions on their school assignments and exams, they felt that this was pointless and noted "what good is that when you're just a student" (Dean, 2019, p. 27). Dean mentioned that they had nothing to strive for without sport, no friends, nothing to look forward to, and no one that they felt would listen to them. Dean also acknowledged that their SRC experience and athletic identity impacted other avenues of their life, such as distancing themself from their friends and family, education (i.e., their major for school was chosen so they could focus on lacrosse everyday), and interactions with others and their social network. Finally, the author stated more globally that they were lost and confused, had no sense of belonging, no clear social status, and did not know who they were without lacrosse.

Another qualitative study came from Caron and colleagues (2021), where they explored the social dynamics between three different athlete-teammate-coach triads using semi-structured interviews. The three triads were made up of university-level athletes, teammates, and coaches with the goal of exploring how the psychosocial dynamics in sport teams may help or hinder an athlete's SRC recovery. In one of the athlete-teammate-coach triads the main theme involved identity where the athlete, "Cassie" (a pseudonym for the university rugby player who suffered SRC), reported having difficulties with their identity by quoting "I didn't know who I was anymore. It was kind of [like] a loss of identity" (Caron et al., 2021, p. 4). Cassie was also described by their teammate (who was also their friend and university roommate) as no longer being viewed as a teammate whilst injured and out of the lineup. Upon Cassie's return to sport, they were treated as a "rookie" despite being a senior on the team. As such, during Cassie's

return to sport they faced the added task of re-establishing their identity as an athlete and leader on the team. Although, instead of returning to this identity, Cassie was placed as a reserve player often with minimal playing time and no travel with the team.

One other qualitative study came from Engström et al. (2020), where they investigated former elite Swedish ice hockey players who were forced to end their hockey playing career and retire due to SRCs. Engström and colleagues interviewed players who had previously played for their national team and/or at the professional level to explore their perspective of forced retirement as a result of SRCs. Within this study, the major theme from the interview data was "Losing one's (athletic) identity," which was constructed from five smaller sub-themes. Among this main theme, former elite ice hockey players described different ways in which they had to shift their athletic identity or lose it altogether, as well as the impact on their current and future lives. In retirement, athletes revealed the difficulties of being reminded of their lost athletic identity (e.g., interactions with fans, journalists, prior teammates) and felt a sense of "emptiness" at the beginning of a new sports season. More specifically, Participant 6 stated that they felt like they were "empty-handed, without anything, with no card left to play in life" (Engström et al., 2020, Forming a post career identity section, para. 4). This lost and empty feeling was mentioned by many athletes as there was a general sense that they had lost their identity and didn't know who they were, where they should go, or what they should do next. Furthermore, Engström and colleagues found that athletes' SRC experience left them a different person entirely that was noticed by their friends and family: "I've been a completely different person and had difficulties finding out who I am, what I want and what I can do" (Participant 6; Engström et al., 2020, Being limited in everyday life section, para. 7).

Thinking more critically about the studies from Dean (2019), Caron et al. (2021), and Engström et al. (2020), it appears as though the athletes in these studies describe more than a shift and/or loss in *athletic* identity. For example, Dean (2019) noted that they were lost and confused with no sense of belonging or a clear social status despite acknowledging other social statuses in their life: "What good is that when you're just a student" (Dean, 2019, p. 27). Another example is from the Caron et al. (2021) study. "Cassie" mentioned losing their sense of identity and how it not only impacted their relationships with their teammates, but also with their friends and roommates. Finally, participants in the Engström et al. (2020) study highlighted how their current and future identities were altered as a result of their SRC experience, most notably in their family and professional life. Taken together, participants in previous research appear to be describing a shift and/or loss in identity that encompasses more global factors of their identity, such as their viewpoint as a student (Dean, 2019), disrupted relationships with friend groups (Caron et al., 2021), and perspectives about who they are as an individual (Engström et al., 2020). For researchers in domains outside of sport, it has been well established that human beings have social (e.g., school friend group, homeless shelter volunteer group, ethnic group) and personal (e.g., I am smart, funny, strong, driven) identities that are interrelated and comprise our complex *self-concept* (i.e., what comes to mind when individuals think about themselves and how they view themselves; Hogg, 2020; Hogg et al., 1995; Oyserman et al., 2012). Thus, in order to better understand the impact of SRCs on elite athletes' identity, we must explore research that has been conducted on the self-concept and identity in other domains.

Identity and Self-Concept

Research on the self-concept and identity in social and behavioural psychology can be traced back to the pioneering work of William James in the late 1800s (James, 1890; Ronkainen

et al., 2016). William James, a renowned psychologist, produced a number of influential theories and perspectives (e.g., consciousness, emotion, identity), and James was credited for distinguishing the field of psychology from philosophy (Myers, 1985). However, it wasn't until the 1960s and 1970s where researchers within social psychology began extensive research on James' work on identity (Erikson, 1968; Hornsey, 2008; Ronkainen et al., 2016; Tajfel, 1969, 1978; Tajfel & Turner, 1979). From this research, it can be surmised that individuals hold more than one identity (i.e., identities) where each identity may include traits and characteristics, social relations, roles, and/or a social group membership that helps define that individual (Oyserman et al., 2012). Furthermore, it was established that individual identities are embedded within individuals' self-concept, which is comprised of individuals' overall conception and understanding of their various identities, thoughts, feelings, personality, and memories of who they are within their perceived self (Owens & Samblanet, 2013; Oyserman et al., 2012; Stets & Burke, 2003). Together, identity and the self-concept have also been used to form the basis for influential theoretical perspectives in social psychology, most notably within the *Social Identity Approach* (Hogg, 2016; Hornsey, 2008; Oyserman et al., 2012).

Social Identity Approach

The roots of the Social Identity Approach are largely owed to work conducted within social psychology (Hogg, 2020; Hornsey, 2008; Tajfel, 1978; Tajfel & Turner, 1979). In particular, researcher Henri Tajfel became heavily invested in intergroup relations, social categorization, and social comparison after the events that occurred during World War II (Hogg, 2020). As a Polish individual of Jewish faith living in Europe during the 1930s and 1940s, Tajfel wanted to understand how prejudice, discrimination, and intergroup conflict interacted with their research on social categorization and perception (Hogg, 2016; Tajfel, 1969). This resulted in a

series of experiments throughout the 1970s that focused on in- and out-group behaviour (S. A. Haslam et al., 2020; Tajfel, 1970; Tajfel et al., 1971). In these experiments, researchers found that when individuals were arbitrarily categorized into groups, they tended to heavily favour the group they had been placed into even though they had never met their group members (nor out-group members), had no future with these groups, were focused on trivial tasks, and had no benefit outside of the studies (Billig & Tajfel, 1973; Hornsey, 2008; Tajfel, 1970; Tajfel et al., 1971). In order to better understand these social behaviours exhibited by participants, Henri Tajfel, along with colleague and former graduate student, John Turner, developed *Social Identity Theory* (i.e., the first of two theoretical perspectives that comprise the Social Identity Approach; Hogg et al., 1995; Tajfel, 1978; Tajfel & Turner, 1979; Turner et al., 1987).

Social Identity Theory

Social Identity Theory remains as one of the most influential theories in social psychology and is often used as the basis to understand identity, group processes, and intergroup relationships (R. Brown, 2000; Ellemers & Haslam, 2012; Hogg, 2020; Scheepers & Ellemers, 2019; Trepte & Loy, 2017). At the core of Social Identity Theory, the focus is on the self-concept and *personal* and *social identity* (Hogg, 2016). Personal identity is the attitudes, memories, behaviours, beliefs, personality, and emotions that defines and distinguishes an individual from others (Hitlin, 2003; Hornsey, 2008). Social identity is the social groups to which individuals belong to and the emotional significance and evaluative consequences (i.e., with in- and out-group members) involved with this membership (Hornsey, 2008; Tajfel, 1972, 1978). As a member of a social group, individuals conceptualize a social identity associated to that group. This social identity describes and prescribes attributes of the group, such as who they are and how they should think, feel, and behave (Hogg et al., 1995). Individuals strive for a

positive social identity by constantly categorizing, comparing, and evaluating in- versus out-group members (Trepte & Loy, 2017). This categorization process is what helps individuals understand who is "us" versus "them" so they can determine which part of their self-concept and identity to activate (Hornsey, 2008). However, John Turner, sought to refine Social Identity Theory with *Self-Categorization Theory* as Social Identity Theory did not explain intragroup processes nor fully explain which social identity became salient and in what context (Turner et al., 1987).

Self-Categorization Theory

Though Self-Categorization Theory was developed to refine and expand upon Social Identity Theory, the two theories are based in the same theoretical perspectives and share similar assumptions (Hornsey, 2008). Both theories acknowledge that people exist within a socially structured world rooted in social groups that impact humans' perception, cognition, and behaviour (Turner & Reynolds, 2011). Social categorization is also used in both theories where people are defined and understood as individuals, but also as members of social groups and categories (e.g., age categories, cultural categories, economic categories; Trepte & Loy, 2017). However, Self-Categorization Theory extends Social Identity Theory's focus on intergroup relations to intragroup behaviour and group behaviour in general (Hornsey, 2008; Reicher et al., 2010). Moreover, Self-Categorization Theory elaborates on context in relation to identity activation by explaining that depending on the salience of the social context, the individual's behaviour may be driven by either a social identity, their personal identity, or a varying combination of both (Trepte & Loy, 2017). This distinction between which identity will be salient and, subsequently, how an individual's behaviour will be impacted is made due to a social category's *accessibility* and *fit* (Abrams & Hogg, 2010). A social category is made more

accessible if the category is important to the individual, is used frequently, is relevant to the social context, and/or the individual is primed and motivated to use the category (Abrams & Hogg, 2010; Trepte & Loy, 2017). The social category is more likely to fit if the category makes sense of social behaviour within the social context and when the distinction between intercategories and intracategories are maximized and minimized, respectively (Abrams & Hogg, 2010; Hornsey, 2008). Thus, with the complimentary nature of Self-Categorization Theory to Social Identity Theory, both theories can be viewed and applied together as the collective Social Identity Approach (Abrams & Hogg, 2010; Hogg, 2016; Hornsey, 2008; Reicher et al., 2010).

Taken together, Social Identity Theory and Self-Categorization Theory provide a more comprehensive framework for understanding identity and group processes, known as the Social Identity Approach (Hogg, 2020; Hornsey, 2008; Trepte & Loy, 2017). In recent years the Social Identity Approach has been applied to the sport and exercise context (Bruner & Benson, 2018; Rees et al., 2015). The Social Identity Approach has proven to be an effective framework to understand sport-related behaviours, sport group formation and development, effective sport leadership, and among others (Bruner & Benson, 2018; Rees et al., 2015). However, the Social Identity Approach has not been applied to the study of SRC recovery and return to sport (Caron et al., 2017, 2021; Dean, 2019; Engström et al., 2020; Kroshus, Garnett, et al., 2015). The over-reliance on "athletic" identity has potentially omitted other important aspects of identity (i.e., personal, and social identity, and the self-concept). The Social Identity Approach appears to provide a more comprehensive understanding to these identity constructs (i.e., athletic, personal, and social identity, and the self-concept), how they impact individuals' thoughts, beliefs, and behaviours, and provides perspective on the intertwined nature of identity (Hogg et al., 1995; Reicher et al., 2010; Tajfel, 1978; Tajfel & Turner, 1979; Turner et al., 1987).

Objective and Research Questions

The goal of this research was to explore the impact of SRCs on elite athletes' identity constructs (i.e., athletic, personal, and social identity, and self-concept). Specifically, we were interested in elite athletes' conceptualization of a shift and/or loss in identity following SRC.

Chapter 2

Presentation of the Manuscript

Examining the role of identity following a sport-related concussion among elite athletes

Cameron B. Collict & Jeffrey G. Caron

Faculty of Medicine - School of Kinesiology and Physical Activity Sciences, Université de Montréal

Centre for Interdisciplinary Research in Rehabilitation

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Abstract

Researchers have explored the impact of a sport-related concussion (SRC) on athletes' identity almost exclusively through the lens of athletic identity. However, this approach neglects other important identity constructs, such as personal (e.g., personality, emotions), and social identity (e.g., family, student), and the self-concept (i.e., collectively, personal, and social identity). Using the Social Identity Approach, this qualitative, multi-method study explored the impact of SRC experience on the identity constructs of seven (n = 6 female, M = 25.1 years) elite soccer, swimming, ice hockey, and curling athletes. We collected data using two semi-structured interviews (M_{time} = 83.7 and 76.9 minutes, respectively). The second interview included the Social Identity Mapping Tool, a comprehensive visual display of individuals' social identity and social network. We used a reflexive thematic analysis and organized the data into three themes. *SRC Experience Threatening the Self-Concept* (Theme A) explored disruption to participants' identity constructs during SRC recovery. *Post-Concussion Identity* (Theme B) described how participants' identity constructs changed when recovered. *Identity Management Through Social Identity* (Theme C) explained how the dynamics of participants' social identity impacted disruptions to identity constructs throughout the SRC experience. Results highlighted that elite athletes with SRCs may encounter identity disruption that extends beyond merely their athletic identity. Although this study expands the knowledge around identity disruption from SRCs, we suggest future research explore potential intervention strategies for managing identity disruption from SRCs.

Keywords: sport-related concussion, elite athletes, Social Identity Approach, qualitative methods, Social Identity Mapping Tool, sports injury, athletic identity

Examining the role of identity following a sport-related concussion among elite athletes

Though it is well documented that sport participation can lead to improvements in health and wellbeing, sport involvement is also associated with an increased risk of injury (Biese et al., 2019; Hootman et al., 2002; Post et al., 2017), including a sport-related concussion (SRC; Kazl & Torres, 2019). Incidence rates of SRCs are as high as 1,153 per 100,000 residents in some Canadian provinces (Public Health Agency of Canada, 2020) and consist of upwards of 44% of all injuries in some sports (e.g., ringette, ice hockey, rugby; Langer et al., 2020). Additionally, higher incidence rates of SRCs are associated with certain demographics such as, females (Kerr et al., 2019), adults and adolescents (Langer et al., 2020; Tsushima et al., 2019), a higher level of sport participation (Dompier et al., 2015), as well as participation in contact (e.g., soccer, basketball) and collision sport (e.g., American football, ice hockey, rugby; Zuckerman et al., 2015). Furthermore, evidence suggests that incidence rates of SRCs are increasing in some major sports leagues like the National Collegiate Athletic Association (Dick et al., 2007; Hootman et al., 2007; Houck et al., 2016), Premiership Rugby League (West et al., 2020), the English Premier League, and Major League Soccer (Ramkumar et al., 2019).

Athletes suffering from SRC often experience a complex symptomatology of *somatic* (e.g., headache, tinnitus; Mullally, 2017), *cognitive* (e.g., memory deficits, decreased reaction time; Sandel et al., 2017), *emotional* (e.g., mood disturbances, impulsivity; Covassin et al., 2017; Rice et al., 2018), *physical* (e.g., loss of consciousness, balance disturbances; Teel et al., 2017), and *sleep disturbance* domains (Murdaugh et al., 2018). While resolution of SRC symptoms typically occurs within 2-weeks in adults (Leddy et al., 2017; McCrory, Meeuwisse, et al., 2017), approximately 20% of adults experience prolonged symptom recovery past this timeframe (Asken et al., 2018; Davis et al., 2017; Kontos, Elbin, et al., 2019; Makdissi et al., 2017; Zemek

et al., 2016). This is particularly concerning as SRC symptoms may last months to years post-impact and may negatively impact athletes' well-being when SRC is improperly managed (André-Morin et al., 2017; Caron et al., 2013; Meehan et al., 2013). Specifically, a mismanaged SRC can result in long-term consequences, such as changes in brain chemistry and early signs of neurodegenerative conditions (e.g., Alzheimer's, Dementia; Koerte et al., 2015; McKee et al., 2013; Mez et al., 2017) as well as psychological and social (i.e., psychosocial) consequences (e.g., feelings of isolation, mood/emotional disturbances; André-Morin et al., 2017; Bloom et al., 2020; Caron et al., 2013, 2017; Dean, 2019).

There remains a dearth of empirical literature on the psychosocial consequences of SRCs (Bloom et al., 2020; Kontos, 2017). The lack of literature on the psychosocial consequences of SRCs can be partially attributed to the misconception of physical symptoms (i.e., headaches) being the only concern for concussed individuals (Ashina et al., 2019). Kontos, Sufrinko, and colleagues (2019) found that concussed individuals in their study reported psychosocial and physical symptoms with approximately the same level of concern. Headaches *(n* = 61, 26% of patients) and psychosocial symptoms (i.e., mood and emotional disturbances*; n* = 56, 24% of patients) were the top two primary symptom concerns for concussed individuals within this study (Kontos, Sufrinko, et al., 2019). Mood and emotional disturbances are just one noted example of the psychosocial implications of SRCs (Carlson et al., 2020; Rice et al., 2018; Yrondi et al., 2017), but researchers have also explored other psychosocial consequences of SRCs, such as external and internal pressures to return to sport (Kroshus, Garnett, et al., 2015), feelings of isolation (André-Morin et al., 2017; Caron et al., 2017), and athletic identity disruption (Caron et al., 2017, 2021; Dean, 2019; Engström et al., 2020; Kroshus, Kubzansky, et al., 2015).

In particular, literature on the disruptive impact of SRCs on individuals' identity has begun to grow (Caron et al., 2017, 2021; Dean, 2019; Engström et al., 2020; Kroshus, Kubzansky, et al., 2015). Within this literature, identity disruption has been conceptualized and examined through individuals' *athletic identity*. Athletic identity is defined as "The degree to which an individual identifies with the athlete role, within the framework of a multidimensional self-concept" (Brewer et al., 1993, p. 273). Along with this definition, Brewer and colleagues (1993) created the 10-item Athletic Identity Measurement Scale (AIMS) to assess the exclusivity and strength in which an individual identifies with their athlete role. This understanding and assessment of identity has been used in sport-related literature in areas such as career transitions (Sanders & Stevinson, 2017; Stambulova & Samuel, 2020), participation in sport (Lamont-Mills & Christensen, 2006; Tasiemski & Brewer, 2011), and sport injury (Petrie et al., 2013; Podlog et al., 2011). As such, Brewer and colleagues' (1993) conceptualization of athletic identity remains as the dominant theoretical framework to explore identity within sport (Renton et al., 2021; Ronkainen et al., 2016).

In recent years, qualitative literature on the impact of SRC experience on individuals' athletic identity has begun to emerge (Caron et al., 2021; Dean, 2019; Engström et al., 2020). For example, Dean (2019) conducted an autoethnography of their own SRC experience in collegiate lacrosse where they stated about their athletic identity disruption that they had "a self that was lost and confused without guidance, or a sense of belonging. I had no clear-cut social status and did not know who or what I was without it" (p. 26). Additionally, Caron et al. (2021) explored three different athlete-teammate-coach triads and their perspectives of the athletes' SRC experience. One of the athlete-teammate-coach triads centred around identity disruption where the athlete stated, "I didn't know who I was anymore. It was kind of [like] a loss of identity"

(Caron et al., 2021, p. 4). Furthermore, Engström et al. (2020) explored the identity disruption of professional ice hockey players who were forcibly retired due to their SRC(s) where one athlete stated, “It felt like I was empty-handed, without anything, with no card left to play in life” (Engström et al., 2020, Forming a post career identity section, para. 4). Though these studies highlight the athletic identity disruption associated with SRC experiences, athletes appear to be discussing identity disruption that goes beyond the athlete role, and researchers fail to consider other important aspects of identity (i.e., personal, and social identity, and self-concept; Hogg, 2020; Hogg et al., 1995; Oyserman et al., 2012).

The Social Identity Approach is a theoretical perspective that has been used to examine identity within social psychology (Hogg, 2020; Hornsey, 2008; Tajfel, 1978; Tajfel & Turner, 1979). The Social Identity Approach is based in a few aspects of identity (i.e., personal, and social identity, and self-concept) and is largely comprised of two theoretical perspectives, *Social Identity Theory* and *Self-Categorization Theory* (Hogg, 2020; Hornsey, 2008; Tajfel, 1978; Tajfel & Turner, 1979; Trepte & Loy, 2017). Social Identity Theory focuses on the social identity that is attributed to individuals’ specific social group memberships and the categorization process that determines in- and out-group members for these social groups (Hornsey, 2008). Self-Categorization Theory extends Social Identity Theory’s focus of intergroup behaviour to the intragroup behaviour and group behaviour in general (Hornsey, 2008; Reicher et al., 2010). Additionally, Self-Categorization Theory attempts to examine the contextual factors that might activate a particular social or personal identity, or a combination of the both (Trepte & Loy, 2017). Taken together, the Social Identity Approach appears to offer a more comprehensive theoretical framework for understanding identity disruption and group processes related to SRC experiences in athletes.

Objective and Research Questions

The aim of this study was to explore the SRC experiences in elite athletes and the subsequent impact to their identity constructs (i.e., athletic, personal, and social identity, and self-concept). Specifically, we explored elite athletes' conceptualization of their shift and/or loss in identity from a qualitative perspective using the Social Identity Approach as our identity conceptual framework.

Methodology and Methods

Philosophical Positioning

The present study was situated within an *interpretivist* paradigm, which attempts to understand the subjective meaning that individuals create for their lived experiences and the world around them (Goldkuhl, 2012; Kivunja & Kuyini, 2017; Potrac et al., 2014; Willis et al., 2007). We adhered to a *critical realist* ontology, which assumes that one reality/universe exists independent from the individual, but also acknowledges that we may not fully understand this reality (Poucher et al., 2020). We also adhered to a *subjectivist and transactional* epistemological position, where we viewed knowledge as being created through interactions with the participant and that knowledge is shaped by previous interpretations of our (participants' and researchers') experiences (Denzin & Lincoln, 2017; Kivunja & Kuyini, 2017).

Methodology

Methodology in qualitative research refers to the framework (i.e., procedures, philosophical positioning, and methods) that guides the way a study is conducted (Skinner et al., 2020). Researchers must choose the "best fit" to address their research problem and based on their philosophical position (Opoku et al., 2016; Skinner et al., 2020), as the methodology ultimately impacts the methods (i.e., specific research techniques used within a study, such as

participant recruitment, data collection, etc.; Mills & Birks, 2014; Willig, 2008) as well as the results. The methodology selected for this study was a *Generic Qualitative Approach*, as it provides researchers with a lens to investigate subjective phenomena, attitudes, behaviours, thoughts, and beliefs of individuals' experiences within the world around them (Percy et al., 2015). To conduct a rigorous study using generic qualitative approach methodology, Caelli et al. (2003) posited four key aspects of inquiry that must be addressed: 1) philosophical position, 2) the researcher's theoretical positioning (i.e., motives, reasoning, and personal history with the study the topic), 3) congruency between methodology and methods, and 4) establishing rigour strategies. Each of these points will be discussed in the remainder of this chapter (with the exception of philosophical positioning, which was articulated in the previous paragraph).

Participants and Sampling

We used *criterion purposeful sampling* (i.e., predetermined eligibility criteria that individuals must meet in order to participate in the study; Moser & Korstjens, 2018) to target the elite athlete population for recruitment. Elite athletes were chosen because they report a stronger athletic identity when compared to lower level athletes and as such, may be more likely to experience a significant disruptive shift and/or loss to identity when removed from sport (Lamont-Mills & Christensen, 2006; Swann et al., 2015). We used Swann and colleagues' (2015) four elite athlete classifications (i.e., semi-elite, competitive-elite, successful-elite, and world-class elite) to guide our understanding of participants' sport level. We recruited participants using online social media posts on Cameron Collict's (CC) public Facebook, Twitter, and Instagram accounts to help overcome geographical barriers, increase recruitment cost-effectiveness, reduce recruitment time, and connect with hard-to-reach populations (i.e., elite athletes; Benedict et al., 2019; King et al., 2014; Whitaker et al., 2017).

Athletes were eligible to participate within this study if they were: 1) 18 years of age or older, 2) previously experienced at least one medically diagnosed SRC with protracted symptom recovery (≥ 4 weeks; Leddy et al., 2017; McCrory, Meeuwisse, et al., 2017), 3) have no current symptoms of SRC that would be exacerbated by participation in the study, 4) participated in sport as at least a semi-elite athlete (as defined by Swann et al., 2015)[2] for one season/year or longer, and 5) sustained their SRC with protracted symptom recovery while competing as at least a semi-elite athlete.

Seven elite athletes met the eligibility criteria to participate in this study (See Appendix A for further information on participant demographics). Sample size was determined based off the sample size of prior studies utilizing similar methods of data collection, which were semi-structured interviews and the Social Identity Mapping Tool (SIM; refer to the Data Collection section for further detail on these proposed methods; Cascagnette et al., 2021). Additionally, we followed Braun and Clarke's (2021b) suggestion that when using a reflexive thematic analysis (refer to the Data Analysis section for further detail on this proposed method), it is difficult to determine the "right" number of participants/data items needed to reach saturation. As such, when using a reflexive thematic analysis, the authors note that researchers should keep in mind that the data is constantly evolving and never "complete" (Braun & Clarke, 2021). Researchers using a reflexive thematic analysis must use their discretion to determine when analysis is complete and they have collected sufficient participants/data items to answer their research questions and produce coherent themes (Braun & Clarke; 2021b). As a result, we felt that collecting multiple sources of qualitative data (i.e., SIM and semi-structured interviews; See

[2] The lowest elite athlete classification is a semi-elite athlete, which are athletes who compete below the top level/league/division while still having the opportunity to reach the highest level in their respective sport (e.g., talent development programs, American Hockey League, university/college sport; Swann et al., 2015).

Data Collection section for more details) with seven elite athletes provided us with enough information to interpret and link themes. At the time of data collection, we asked each athlete if they could state their sex (n = 6 females and n = 1 male), however we did not solicit participants' gender and pronoun usage. Thus, in accordance with the American Psychological Association 7th edition guidelines, we decided to use gender neutral pronouns "they/them" when referring to study participants (APA, 2020). To provide a better understanding of the participants' identity constructs, we have provided detailed participant profiles based on the discussion during the interviews and participants' social identity maps (See Appendix B). Names, locations, and other key identifying features of the athletes have been changed to maintain the confidentiality of participants.

Data Collection

Procedure

We collected data with each elite athlete over the course of two *semi-structured interviews*, which involved using the *Social Identity Mapping Tool* (SIM; See Appendix C for an example and abbreviated guide). In line with our interpretivist philosophical position (Goldkuhl, 2012; Kivunja & Kuyini, 2017; Potrac et al., 2014; Willis et al., 2007), the data for this study were largely generated through the conversations between CC and the athletes, participants' social identity maps, as well as CC's interpretations of both the interview conversations and the social identity maps. Interview #1 (See Appendix D for interview guide #1) lasted on average 83.7 minutes (range = 76 to 95 minutes). Approximately one week later, interview #2 was conducted (See Appendix E for interview guide #2) and lasted on average 76.9 minutes (range = 62 to 108 minutes). Also, within interview #2 athletes completed the SIM to produce a map of their social identity and social network. While this is a general overview of our procedure, each

interview and the SIM will be described in further detail in subsequent paragraphs. Due to the COVID-19 pandemic, all interviews were conducted via videoconference.

Semi-Structured Interviews

Interviewing is one of the most commonly used methods in qualitative research (Jamshed, 2014; McGannon et al., 2019; Smith & Sparkes, 2016a, 2020). This method allows two or more individuals to engage in an in-depth conversation about the social world around them and the participant's perspective, lived experiences, feelings, emotions, and/or behaviours of interest (D. Barrett & Twycross, 2018; Smith & Sparkes, 2016a; Sparkes & Smith, 2013). We chose to conduct semi-structured interviews because they are a flexible hybrid of a structured and unstructured interview that allows the researcher to prepare pre-determined questions while still allowing the participant freedom to express knowledge they feel is relevant to the study (Brinkmann, 2020). The questions for both semi-structured interview guides in this study were informed by other relevant interview guides (e.g., Caron et al., 2021; Cascagnette et al., 2021), the AIMS (Brewer et al., 1993), the Social Identity Questionnaire for Sport (Bruner & Benson, 2018), and SIM (Bentley et al., 2020; Cruwys et al., 2016). The goal for interview #1 was to understand athletes' SRC experience(s), their identity constructs in general, and how their identity constructs may have been impacted by the SRC experience(s). The aim for interview #2 was to provide an opportunity to follow up on thoughts/questions from interview #1, complete the SIM, and discuss the participants' social identity map in further detail.

Social Identity Mapping Tool

The SIM was selected as a data collection method for this study because it provides a comprehensive visual overview of individuals' social connections and their self-reflections of those connections (Cruwys et al., 2016; Jetten et al., 2010). Specifically, the SIM is similar to a

"mind map," whereby individuals construct a comprehensive visual representation of their social identity constructs and the social groups to which they belong to for comparison, reflection, and assessment (Bentley et al., 2020; Cruwys et al., 2016).

The pen-and-paper version of the SIM was used in this research because it is free to use and requires minimal supplies (i.e., paper, sticky notes of varying sizes, and a pen or pencil; See Appendix C for an example and abbreviated guide). Using these supplies, participants were asked to create a visual map of the groups they belong to, interrelations between the groups, similarities/differences in their groups, and their feelings and perspectives of their group involvement (Bentley et al., 2020; Cruwys et al., 2016). Although participants were offered to be sent the materials required to complete the SIM, each participant declined and subsequently used materials they had at their disposal.

Participants typically began the SIM by writing the names of their social groups on sticky notes (i.e., larger the sticky note, the more important that group is perceived to their identity constructs). Participants were asked to answer Likert-style questions about their involvement in their specific social groups on each sticky note placed on their map (i.e., top left = I feel a sense of being "connected" with other members in this group [1 to 10 scale, 10 as the most connected], top right = In general, being a member of this group is an important part of who I am [1 to 10 scale, 10 as the most important], bottom left = Generally, I feel good when I think about myself as a member of this group [1 to 10 scale, 10 indicating feeling the best], bottom right = In a typical month, how many days would you engage in activities [i.e., in-person or virtual] related to this group [0 to 30 scale], and bottom centre = For how many years have you been a member of this group [0 to current age scale]). Given that the Likert questions on the SIM are not standardized, they can be modified to fit the study's needs. As such, we borrowed questions one

to three from Bruner and Benson's (2018) Social Identity Questionnaire for Sport, and questions four and five were borrowed from Cruwys and colleagues' (2016) pen-and-paper version of the SIM. Next, spatial organization of the sticky notes were used to indicate group similarity (i.e., the closer the groups are to one another, the more similar they are perceived and vice versa). Finally, lines were drawn to connect groups to indicate compatibility between groups (i.e., no line indicates no compatibility, a straight line denotes high compatibility, a squiggly line indicates moderate compatibility, and a more jagged line denotes low compatibility; See Appendices F-L for the participants' completed social identity maps).

Researcher

Within qualitative research, it is generally accepted that the researcher has some base knowledge of the topic of inquiry whether that be through their own lived experiences or research/educational background (Clark & Vealé, 2018; Percy et al., 2015). In line with Caelli and colleagues' (2003) four key aspects to a generic qualitative approach and also to be transparent throughout the research process, qualitative researchers should address their experiences and potential biases by outlining their background, assumptions, and beliefs related to the study (A. Barrett et al., 2020; Clark & Vealé, 2018; Dodgson, 2019; Johnson et al., 2020; Smith & McGannon, 2018). As the principal researcher of this study, I (CC) have a background in kinesiology and sport psychology. I have participated in competitive collision (i.e., ice hockey and rugby) and contact (i.e., soccer and volleyball) sports, but have not competed at the elite level. I have never been medically diagnosed with SRC throughout my sport participation, but I have experienced a concussion due to a car accident. I also have not experienced a significant sudden change in identity conceptualization, but I believe all aspects of identity are dynamic constructs that are subject to change over the course of our lives.

Data Analysis

We conducted a thematic analysis because it is a theoretically flexible method that can apply to many different research methodologies and philosophical positions (Braun & Clarke, 2021a; Maguire & Delahunt, 2017; Percy et al., 2015). Specifically, we used a *reflexive thematic analysis*, as it is not linked to any methodology and it allows subjectivity in theme development, promotes rigour, and applies well to the congruency of a generic qualitative approach and our interpretivist paradigm (Braun & Clarke, 2021a; Caelli et al., 2003). With a reflexive thematic analysis, the researcher is critical to the analysis because their prior knowledge, experiences, and involvement in the study helps shape the findings and generated themes (Braun & Clarke, 2021a; Terry & Hayfield, 2020). The reflexive aspect is the researcher acknowledging, reflecting, and thinking internally throughout the analysis on the ways in which their experience, interests, values, and training influences themselves, the themes being formed, and the overall analysis (Terry & Hayfield, 2020; Trainor & Bundon, 2020). CC used his reflexive journaling and his thesis advisor, Dr. Jeffrey Caron (JC), as a critical friend (See Methodological Rigour section for further details) for methods of reflexivity in this study.

Phase one of the reflexive thematic analysis, *familiarization*, began with the lead researcher, CC, immersing himself in the data by conducting and transcribing all interviews (data were stored using the NVivo software package), performing reflexive journaling after each interview (also performed throughout phases 2-6), and reviewing the interview transcripts, interview videos, and participants' social identity maps for clarity. Phase two, *coding*, was performed to generate codes (i.e., something within the data that is viewed as interesting, relevant, or important; Braun & Clarke, 2021a) from the data. To help maintain a consistent understanding of each participant's SRC experience(s), identity constructs, and disruption to

identity, CC coded each participant's data one by one in its entirety. This process continued until CC completed one full readthrough and subsequent coding passthrough of each participant. Phase three, *generating initial themes*, followed shortly after coding where CC developed initial broad first-, second-, and third-level themes. Typically, a theme attempts to capture patterns within the data that work to tell a rich story of the data while meaningfully answering the research questions (Clarke & Braun, 2014; Scharp & Sanders, 2019). During this phase, JC assisted CC by providing another perspective to help further promote reflexivity and critical thinking of the developing themes.

Phase four, *reviewing and developing themes*, was initiated by CC conducting another passthrough of each participant's data in a similar manner to phase one with the goal of revising the coded extracts selected for each theme developed in phase three. Phase five, *refining, defining, and naming themes,* had the aim of refining and defining each theme for what they encompass and how they interrelate. With assistance from JC, CC developed a visual depiction of the study's themes and their interrelatedness (See Figure 9), and a table of the themes were created (See Appendix M). Finally, phase six, *writing up*, was completed by CC in collaboration with JC by producing the written report of the study's themes and their specific examples from the data and their relation to the research questions as observed in the remaining sections below.

Methodological Rigour

As previously mentioned, the explicit use of rigour strategies in qualitative research is a part of Caelli and colleagues' (2003) four key aspects to produce a reliable and credible generic qualitative approach. We adhered to S. Burke's (2016) *relativist approach* to demonstrate rigour in the current study, as it aligns with our interpretivist philosophical paradigm (S. Burke, 2016). We propose two criteria to judge the quality of this study: *width* and *transparency*. Width is the

criteria that assesses the comprehensiveness of evidence and quality of data collection and analysis (S. Burke, 2016). Given that only 10% of recent qualitative sport psychology studies have used multiple data collection methods (McGannon et al., 2019), this multi-method study allowed us to obtain an in-depth knowledge of elite athletes' identity disruption from their SRC experience. Transparency is the assessment of whether the researchers were open with the research process and provided clear descriptions of the findings (S. Burke, 2016). We used two modes of transparency within this study, *critical friends* and *reflexive journaling*. JC acted as CC's critical friend to encourage reflexivity by challenging each other's interpretation of the data and construction of knowledge (Cowan & Taylor, 2016; M. Meyer & Dykes, 2019; Smith & McGannon, 2018). CC conducted reflexive journaling by producing an ongoing trail of thoughts, potential biases, and interpretations throughout data collection (i.e., after each interview) and data analysis to help facilitate reflection of the research process and improve his awareness of his positionality and how this might influence the research findings (Dodgson, 2019; Hadi & José Closs, 2016; K. Meyer & Willis, 2019; Rettke et al., 2018).

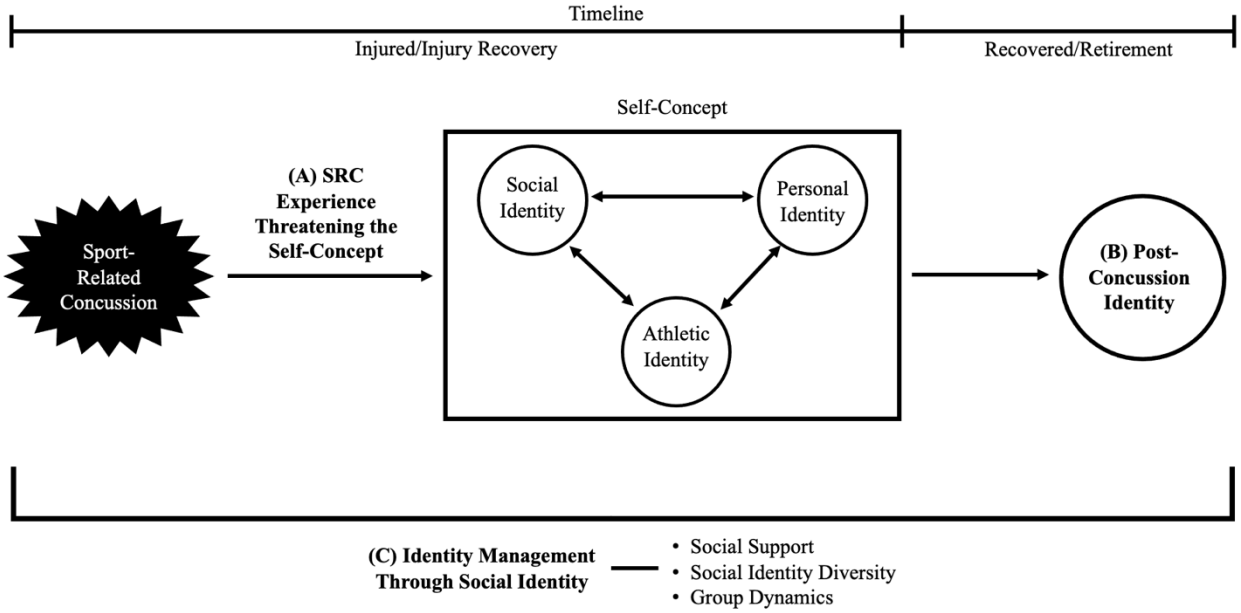
Results

This section will present the three first-level themes from our reflexive thematic analysis: (A) SRC Experience Threatening the Self-Concept, (B) Post-Concussion Identity, and (C) Identity Management Through Social Identity. Figure 9 was developed based on our interpretation of athletes' comments during the interviews (including participants' explanations of their social identity map) in relation to their identity constructs (i.e., athletic, personal, and social identity, and self-concept). Overall, we interpreted that the athletes endured global threats (i.e., perceiving disruptions, alterations, or loss) to their identity constructs from their SRC experience, which impacted them from SRC impact and recovery to when recovered (i.e.,

returned to sport and/or in retirement), but the dynamics of the athletes' social identity and social network were an important factor throughout the entire process.

Figure 9

Visual depiction of themes and their impact to participants' identity constructs



Note: This figure depicts the interconnectedness of the themes formed within this study across the athletes' SRC experience. In line with our conceptualization of identity, guided by the Social Identity Approach (Hogg, 2020; Hornsey, 2008; Trepte & Loy, 2017), we viewed athletic, personal, and social identity as interrelated and influential on one another under the collective self-concept. As such, we interpreted that the athletes in this study experienced a threat to their various identity constructs due to their SRC experience (Theme A). Regardless of the return to sport outcome, each athlete experienced differing changes to their identity constructs that carried with them into their return to sport and/or retirement (Theme B). Finally, based on the participants' comments, it appeared that the make-up and dynamics of athletes' social identity impacted and managed their identity threats (Theme C).

SRC Experience Threatening the Self-Concept (Theme A)

This theme describes how the self-concept (i.e., their collective athletic, personal, and social identities) of the elite athletes in this study appeared to be impacted by their SRC during their SRC injury/injury recovery (i.e., injury timeframe). Our interpretation of the interview data and the athletes' social identity maps was that SRC experience threatened the athletes' various

identity constructs during their SRC injury timeframe, leaving some questioning who they were without sport.

All athletes in this study mentioned how their elite athlete status, their athletic role, and generally, their identification with their respective sports were important to how they viewed themselves as an individual. Specifically, we interpreted comments and descriptions from participants, which included "I am athletic/an athlete" and "Sport is my life," as being consistent with the athletic identity construct (Brewer et al., 1993). For example, Stella, who was a competitive-elite ice hockey player at the time of the interviews, was asked how their different social groups impacted their perspective of themselves. We interpreted from Stella's response that Stella had a strong attachment to their athletic identity, despite noting that some family members disagreed with their pursuit of an ice hockey career:

> *Stella:* This [ice hockey] is what I'm doing with my life. I chose to be here and play hockey. All I'm doing is playing hockey, so I feel like I'm a hockey player [Laughs]—strictly a hockey player. Sometimes people ask me "Oh, what do you do? What's your job?" I'm like, "I'm a professional athlete. Like, that's literally it."

Each participant also included at least one sport-related social group on their social identity map, regardless of their playing status at the time of the study. For example, Larissa, a retired ice hockey player, indicated that nine out of the 12 social groups in their social network were directly related to ice hockey (including their partner whom they met through ice hockey; See Appendix L).

Given that the elite athletes in this study appeared to strongly identify with their athletic identity, it was not surprising that participants described experiencing a threat to their athletic identity as a result of being out of the lineup during their SRC injury timeframe. As an example,

when Jessica was asked how they felt their SRC experience impacted perceptions of themselves, they described feeling lost with no purpose and questioned who they were without swimming:

> *Jessica*: When something is taken from you suddenly that's such a big part of your life it definitely makes you question everything and who you are without it. …I just had nothing then. It was like, "This is happening. You have to recover. I have no purpose anymore."

The threat to participants' athletic identity during their SRC injury timeframe seemed to invoke negative emotional responses (i.e., fear, frustration, and sadness) about being removed from play and unable to participate with their team and in sport. For example, when Jessica was asked about the psychological and social consequences of their SRC, Jessica expressed feeling fearful that being removed from sport due to SRC would impact their social relationships within their swim team upon their return:

> *Jessica:* I basically only hung out with swimmers. We were with each other 18 hours a week. You have a lot of classes together. We live together. So, my fear was that if I fall too far behind [in performance], I'm going to lose all my friends.

The potential loss of all of Jessica's swimming and university friends due to SRC was also included in Jessica's social identity map (See Appendix K). As illustrated on Jessica's map, the main social group that was physically present for Jessica during their SRC experience was their university swim team (depicted as "university swim alumni")—not the remaining social groups, such as "family," "childhood school friends," and "swim coach job[3]."

The athletes in this study also talked about the impact of their SRC on their personal identity during the injury timeframe. We interpreted athletes' general descriptions of their

[3] Was not working as a swim coach at the time of their SRC experience

personality, such as being "extroverted" and "hard-working," as a part of their personal identity (Hitlin, 2003; Hornsey, 2008). Although SRC experiences appeared to impact each athlete differently, some athletes expressed that during their SRC injury recovery their personal identity was impacted through feeling as if specific aspects of their personal identity were threatened and/or they felt that they were a different person entirely. For instance, Tyler said that soccer was an important part of feeling confident in everyday life. When pushed to describe how their confidence was affected by their SRC, Tyler mentioned experiencing a decrease in confidence, which we interpreted as going beyond simply their soccer [athletic] identity, and impacting their personal identity as well:

> *Tyler:* I think when you lose that part of your identity, where you're like "I am playing soccer and I am a soccer player"—I think it affects you in all walks of life. Not just interacting with other soccer players and stuff.

Part of our interpretation of Tyler's statement was guided by CC's previous concussion experience, whereby CC recalled feeling less confident in his ability to return to his "normal" capabilities in school, work, and sport following SRC. Thus, we inferred from Tyler's statement that the SRC injury recovery not only impacted their confidence as an athlete, but also as an individual (i.e., personal identity) in all aspects of everyday life.

Athletes who reported experiencing mood disturbances that impacted them outside of sport during their SRC recovery timeframe were also interpreted as threats to their personal identities. Mood disturbances discussed included irritability, impatience, anxiety, and depression. For example, within the conversation, Stella was asked about some of the psychological and social implications they may have had during the SRC injury timeframe. Stella responded by describing their struggles with controlling their mood and emotions during this time: "I was

angry and lashing out. I was pacing. I was dizzy. I was just like, 'Why me?'" Stella expanded on this thought later in the interview by stating, "I was worried how I handled it [the SRC]. …I was trying to stay happy on the outside, but behind closed doors, I was swearing, losing my shit, and trying to keep it together." Furthermore, Olivia believed that suffering from the impacts of SRC during their injury recovery timeframe contributed to the onset of their clinical depression:

> *CC:* How do you think your concussion impacted how you viewed yourself at the time [of your SRC]?
>
> *Olivia*: Oh, really bad. Really, really bad. Which is why, like, I had very bad clinical depression. It was to the point where I wanted to die. Um, sorry. I need to cry [Crying].

Olivia's statements and emotional responses to questions about the impact of the SRC experience on their identity during their SRC injury timeframe made it clear that depression and feelings of sadness had a serious impact on their personal identity.

Athletes also described the impact of their SRC experience during injury recovery on their social groups and overall social identity. We considered athletes discussing their social network (i.e., social groups they are involved with and their roles within these groups) and the members within their social groups as consistent with our understanding of social identity (Bruner & Benson, 2018; Cruwys et al., 2016; Hornsey, 2008). In particular, athletes' SRC injury recovery timeframe seemed to threaten their ability to maintain their role within their various social groups, especially as university or collegiate athletes. After being asked to describe their SRC experience, Tara highlighted that managing the expectations to continue their role and participation within sport (e.g., observe practices/games, travel with the team, attend team social events) and school left them feeling exhausted:

> *Tara:* It was truly a very exhausting period of time. Not being able to play soccer, but having to be [around] the team. Having to travel and not play, and then having to do schoolwork on top of it. Yeah, it was a lot.

Athletes also expressed feeling isolated from their social network during SRC recovery. For some, it was because they moved far away from home to pursue sport and, as a result, they did not feel as supported by their social network while symptomatic of SRC. However, as Olivia explained, some felt isolated from their social network despite living within the same city:

> *Olivia:* I was also a little bit isolated. I was living at home at the time. My parents were obviously there, but I still spent most of my time at home because I was laying in the dark. I didn't really interact with my friends. I had no idea what was going on [with my friends].

Although the athletes could easily connect with their social network via phone, social media, etc., participants explained that a lack of physical presence from their social network during their SRC recovery timeframe created difficulties. For example, Tyler was asked how their social identity map made them think about their SRC experience. Tyler explained that three out of four social groups (i.e., "family," current recreational "soccer" team, and "co-workers"), who were a part of their social network at the time of the interviews (See Appendix I), were not physically present during their SRC recovery. Tyler noted experiencing less difficulty connecting with their social network because they had some childhood friends, who were not a part of the university soccer team, follow them to university, which was far away from home. Tyler also acknowledged that this additional social group (i.e., childhood friends), who were physically with them at university, might not be the same case for some other soccer teammates who travelled a long way to live near and attend university. Tyler added to this point by mentioning

that elite sport (in Tyler's case university sport) often requires significant time investment that impacts their ability to create and maintain other social groups:

> *Tyler:* When you're playing soccer at university it doesn't leave a lot of time to build new connections outside of soccer and outside of who you already know. …You're basically just seeing every week your housemates and your teammates.

The inability to be physically present with social groups during SRC recovery is something CC also experienced while he was attending university away from friends and family during his concussion recovery. Consequently, CC's previous experiences helped shape our interpretations of Tyler's comments on the physical presence of social groups during SRC recovery.

Overall, we interpreted that the athletes in this study experienced threats to their athletic, personal, and social identity (i.e., their self-concept) during their SRC injury timeframe. Generally, participants' athletic identity and sport participation appeared to be threatened by their SRC experience. Impacts to athletes' personal identity were interpreted through expressed changes to personal identity (i.e., feelings of being a different individual) and mood disturbances, which impacted athletes in all avenues of their life during this time. Perceived threats to social identity appeared to manifest in athletes' ability to manage and maintain their social groups as well as with creating new social groups. Some threats to their identity were temporary, whereas others appeared to last throughout their entire SRC injury timeframe and from months to years post-recovery (i.e., retirement and/or return to sport).

Post-Concussion Identity (Theme B)

This theme explains how athletes' perceptions of their identity constructs were changed when recovered from their SRC (i.e., after returning to sport and/or retirement). Changes to personal identity appeared to vary because some athletes perceived that their personal identity

was disrupted during their injury recovery, but returned to their pre-injury conceptualization when recovered, whereas others felt it did not return to pre-injury conceptualization. Some athletes who returned to sport seemed to change their athlete role (i.e., athletic identity) to be more cautious, whereas athletes who were forced to retire found themselves either forming a new athletic identity (e.g., participating in lower-level sport, coaching) or losing that identity altogether. When recovered from the SRC, alterations to athletes' social identity appeared to be resultant of changes to existing group memberships or gaining membership to new groups. Finally, regardless of the return to sport outcome, the athletes felt they developed a new self-concept that was less centered around their athletic identity.

The degree of change to personal identity appeared to vary between athletes, as some felt their personal identity may have been different while out of sport with their SRC, but not when recovered. In response to being asked how the SRC experience impacted their perspective of themselves, Jamie noted that their personal identity returned to normal upon returning to sport:

> *Jamie:* I don't think it [the SRC] impacted how I viewed myself in the long run [when recovered]. I think it impacted how I was viewing myself in those four weeks [of recovery]. .... I don't think it impacted how I viewed myself, like my personality [personal identity].

However, we interpreted that some athletes felt that aspects of their personal identity were also changed when they returned to sport/in retirement. For example, Jessica described themselves as a leader with a "Type A" personality. When asking Jessica if their identity went back to normal upon returning to sport following their SRC, Jessica seemed to continue to perceive a reduction in their self-esteem and leadership qualities for years after SRC recovery and into retirement:

> *Jessica:* Sometimes you're like, "What if I didn't get a concussion? How would have my swim season gone? Would I have really just taken off and become captain?"—because I used to feel like I had those personality [personal identity] traits.

In looking at Jessica's social identity map, we can see that their current "swim coach job" group holds the smallest importance to their identity (as represented by sticky note size; See Appendix K). As such, we inferred that Jessica's perceptions of their changed ability to represent their Type A and leadership personality characteristics may have contributed to identification with their current coaching role. As another example, Larissa mentioned that after retiring from sport due to SRC, they felt they now needed to take a more active role in managing their own emotional responses to situations. When asked about the impact of their SRC experiences on their current ice hockey coaching role, Larissa noted, "I tell myself like, 'You need to either stop the conversation or hold it [the emotions] inside.' I know it's [the SRCs] hindered my emotional control." We inferred from this statement that Larissa once felt their personal identity involved having strong emotional control in various situations, but that changed following the SRCs and continued into retirement. Overall, some of the athletes in this study felt their personal identity was only threatened during their SRC injury timeframe, whereas others described long-term changes to their personal identity into return to sport or retirement.

Athletes who returned to sport when recovered from their SRC appeared to perceive changes to their athletic identity. Stella, who was still playing elite ice hockey at the time of the study, was asked how their identity had been impacted since their return to sport from their SRC experiences. We interpreted from Stella's response that their identity as an ice hockey player had changed upon returning to sport. Specifically, Stella mentioned that they felt the need to change

their role as an ice hockey player by playing more cautiously and avoiding situations that might cause physical contact with other players:

> *Stella:* I am more cautious now because I feel like I have a bruised brain. I have to take into consideration everything I'm doing, so I'm smarter in a sense with my actions. Going into corners [of the ice rink] and stuff like that. Positioning wise, I have to keep that in mind. Anything that will rattle my brain hurts, so I have to consider that.

Although CC did not participate in sport as an elite athlete, our inferred understanding of Stella's comments came, in part, from CC's acknowledgement that he felt his concussion shaped him into a more hesitant athlete and reduced his desire to participate in high contact and collision sports. As such, we interpreted that when Stella returned to sport following the SRCs, their pre-SRC athlete role (i.e., athletic identity) shifted from a more aggressive and rugged playstyle to being more cautious.

Unsurprisingly, athletes who were forced into retirement from their SRC expressed feeling like they could no longer consider themselves an athlete. This was best explained by Tyler when responding to a question about coming to terms with forced retirement. Tyler's response included when they made the realization of no longer feeling like a soccer player and when they shouldn't derive all their self-confidence from sport, "It was probably immediately after getting off the phone with the coach saying that I wasn't going to be able to play anymore. Putting the phone down and being like, 'Well, I can't say I'm a soccer player anymore.'"

The athletes who were forced to retire also appeared to feel like they needed to develop a new athletic identity in retirement (e.g., coaching, participating in lower-level sport) or avoid sport and physical activity altogether. For instance, Larissa found becoming an ice hockey coach helped them avoid the emptiness in their identity that many athletes experience in retirement.

This seemed to be consistent with Larissa's social identity map because Larissa's new coaching social group (i.e., "college hockey staff") was one of their most important social groups to their identity (i.e., larger sticky note size), they felt a strong sense of being connected with the members of this group (i.e., "10"/10), this group was an important part of who they are (i.e., "9"/10), and generally, they felt good when they thought about themselves as a member of this group (i.e., "9"/10; See Appendix L).

Other athletes who were forced to retired from sport due to SRCs said they avoided sport and physical activity for an extended period after retiring. Tara mentioned there was approximately a two-year period where they didn't associate with soccer and physical activity. To inquire further, Tara was asked how long the SRC experience impacted their identity into retirement:

> *Tara:* I came back [home] April 2017. It wasn't until October 2019 that I decided like, "Okay, you have to get out of the slump of disassociating from soccer" —because I pushed it [soccer] away. I didn't want to play anymore. …I didn't want to do anything. I did not pick up a weight. I did not even want to play soccer afterwards.

An identity construct of participants that was also changed in the long-term when recovered from the SRC was athletes' social identity because some athletes felt they endured changes to their social group membership. As an example, Tara explained that during the SRC recovery timeframe their soccer teammates did not respect their SRC recovery needs (e.g., rest, providing social support, assistance with schoolwork). As such, when retiring from soccer and leaving university, Tara felt the need to disassociate from their university soccer social group (as also noted by the lack of this social group in their social identity map; See Appendix F). However, Tara mentioned that they also gained their "gym friends" social group, which may not

have developed without this SRC experience and leaving soccer and university. Like Tara, CC also experienced losing and gaining social group memberships due to his concussion experience, which assisted with our interpretation of Tara's comments and social identity map. Although CC acknowledged he lost friend groups who did not support his concussion recovery, his interest in concussions from this experience helped him gain social groups through his involvement in concussion research.

Another long-lasting change to athletes' social identity when recovered appeared to be their perceptions of their connectedness and identification within social groups retained throughout the SRC injury timeframe to when they were recovered. For instance, Tyler was asked about how their social groups impacted the SRC recovery. Tyler responded by claiming their removal from sport and subsequent retirement from soccer provided an opportunity to spend quality time with their social groups outside of soccer:

> *Tyler:* I really wasn't tied up in playing soccer. I think my friends that I had outside of soccer going into [university] was the reason for that. …Working where I am working [at a healthcare clinic] and spending more time with my family and friends did make me realize that maybe there's more to being the cocky star athlete. …I think stepping away from that [university soccer] made me realize that I've got a lot going on without that.

Conversely, some athletes, like Olivia, mentioned that their SRC experience negatively impacted perceptions of their connectedness and identification with some of their social groups outside of sport when recovered. Olivia discussed that some members of their family reacted poorly to the SRC experience, which we interpreted as downplaying Oliva's descriptions of the mental and cognitive symptoms they were experiencing. Consequently, Olivia felt that this reaction impacted their relationship and feelings of connectedness within their family in the long-term

when recovered. We inferred that this may have contributed to the low score provided to the question "Generally, I feel good when I think about myself as a member of this group" (i.e., "4"/10) and the smaller sticky note size (i.e., lower importance to their identity) for Olivia's "family" social group (See Appendix G). Though athletes expressed different changes to social identity, it was clear that athletes in this study experienced long-term changes to perceptions of their connectedness and identification within their social groups (from themselves and/or other group members) that remained a part of their social network from the SRC injury timeframe into the long-term when they were recovered.

Changes to participants' identity constructs when recovered from their SRC also included alterations to the perceptions of their self-concept. Specifically, we interpreted that participants' SRC experience helped them develop a more broadly defined self-concept that was no longer largely constructed by their athletic identity. For example, Stella experienced two SRCs within the same season, which caused them to consider retirement. When asking Stella how they felt about the prospect of retiring, Stella mentioned that they did not want to jeopardize the remainder of their life, "I don't want to put my whole life away because of hockey. …I feel like there's more to life than hockey." Later in the interviews Stella was asked about the long-term impacts of their SRC experience where they expanded further on this thought:

> *Stella:* In the long-term [when recovered], I started to realize that hockey isn't my entire life and there's life outside of hockey. After my concussions I started to realize like, I need to kind of figure out what I want to do [outside of hockey].

Another example comes from Olivia who felt that their SRC experience helped them develop a self-concept that was more well-rounded when recovered by exploring social identities outside of sport and developing social groups that were more closely aligned to their personal identity. Our

interpretation of this new well-rounded self-concept came, in part, from the following excerpt from the conversation with Olivia: “I think it [my identity] never went back. …I don’t think I’ve ever been back to the ‘I am curling, and that’s all I have going for me.’ I think it’s [the SRC experience] helped morph back [my self-concept] into a more well-rounded person.” This was also depicted in Olivia’s social identity map, where five new post-SRC social groups were noted including their “school exchange friends” group, “work group 2,” “music artist Discord” group, “Reddit” group, and their new “curling” group (See Appendix G).

In sum, the SRC experiences described by participants seemed to alter their perception of their identity constructs in the long-term when recovered from the SRC (i.e., returned to sport and/or in retirement). Although some athletes seemed to experience changes to their personal identity, others found it stayed relatively the same. Participants who returned to sport appeared to have an altered sense of their athletic ability (i.e., athletic identity) and a change in their playstyle, whereas those forced to retired felt the need to either reform a new athletic identity or forgo it altogether. Alterations to social identity seemed to present as changes to social group involvement as well as perceptions of connectedness and identification within retained social groups throughout the entire SRC experience. Finally, participants seemed to develop a broader definition of their self-concept that was less focused on their athletic identity.

Identity Management Through Social Identity (Theme C)

This theme describes how athletes’ social identity and the interactions with their social group members and individuals around them influenced their perceptions of identity disruption during SRC recovery and when recovered. Most notably, the structure of athletes’ social network and the type of *social support* received influenced their perceptions of identity disruption. More specifically, athletes with a sport-focused social network appeared to exhibit more disruption to

their identity constructs. Also, we inferred that there were five different types of social support contributing to identity disruption: a) belief that support was available, b) emotional support, c) guidance and knowledge support, d) esteem support, and e) tangible support. Finally, two other aspects of athletes' social network that seemed to contribute to their identity disruption included negative perspectives of being a non-athlete and elite sport participation in general and conflicting views with social group members.

Many athletes discussed having a sport focused social network with few non-sport related social groups at the time of the study, but also during their SRC experience. As such, we interpreted that the athletes with a less diverse social network (i.e., more sport-focused with less and/or weaker connections to non-sport related social groups) experienced more significant disruptions to identity during SRC recovery and when recovered. For example, Jessica discussed how their social network was heavily swimming related, especially at the time of SRC recovery:

> *Jessica:* My whole social network is very swimming [related]. I married a swimmer. My mother in-law is a swim coach. My sisters are swimmers. Everything revolves around that [swimming]. If it [the SRC] does impact one area of my life, it impacts everywhere because it all stems from the sport of swimming.

The interrelated nature of Jessica's social and athletic identity also appeared to be supported with their social identity map (See Appendix K). Two out three of the social groups that were a part of Jessica's social network during their SRC recovery and when returned to sport (i.e., "university swim alumni" and "family") were noted to be swimming related. Thus, Jessica's statement in conjunction to the noted lack of diversity in their social network during their SRC experience was interpreted to negatively contribute to their perceptions of identity disruption.

Although many athletes described instances of receiving social support from members of their social groups, a few athletes described instances when they did not believe they had social support available to them. This lack of belief in their social support availability appeared to negatively impact their perceived identity following SRC, a point that we did not find surprising given that CC had a similar belief that the availability of social support to an individual (e.g., during SRC recovery) could greatly impact the individual and their response/outcome. For example, Olivia mentioned enduring negative mental health outcomes (i.e., clinical depression) from their SRC during recovery. However, within Olivia's SRC injury timeframe, Olivia overheard a friend, who was a university mental health counsellor, make a comment that impacted their perceptions of the social support available to them, "I offhand heard her [university counsellor friend] make a comment being like 'Oh, I'm so tired of these anxiety, depression, and eating disorders. Can't you come up with something interesting?'" When following up about how this impacted Olivia's self-concept, Olivia said that they felt judged about their depression symptoms, and consequently began withdrawing from their university friend group. Olivia also inferred that this interaction led to an unwillingness to seek support from friends as well as at the university wellness centre.

Athletes who received emotional social support (e.g., compassion, empathy) from members of their social network seemed to describe how this helped them manage their identity disruptions. For Tyler, it seemed that dissociating from their university soccer team and semi-elite soccer athletic identity in general were impacted, in part, by the lack of emotional support from their teammates during SRC recovery and the subsequent forced retirement. Thus, when Tyler was asked to compare their SRC in first year university to a concussion sustained outside of soccer during second year, they stated:

> *Tyler:* I'm not saying that my teammates thought I was faking, or that I was soft, or whatever [with the SRC]. But there was kind of the impression of like, "Well, what's wrong with you?" …I would say it reaffirmed my preconceived notion that maybe the people on the soccer team didn't really have my best interests at heart.

Conversely, when Stella was asked to reflect on their social identity map, part of their response alluded to the impact of the emotional social support provided by some of their friends:

> *Stella:* If anything, it [SIM] made me realize my friends were of small importance. But then, my best friends were way more important because they were the ones that I talked to, and stuff like that. They kind of got me through it [both SRCs], in a sense.

Both groups mentioned by Stella (i.e., "best friends" and "friends"; See Appendix H) appeared to help Stella better manage their perceptions of identity disruption during SRC recovery. However, the differences noted by Stella in the emotional support received by these two groups may have contributed to their present identification with these groups. Thus, these two examples seem to display the positive and negative implications of emotional social support for athletes' identity constructs following SRC.

Participants who described instances when members of their social groups and individuals around them were knowledgeable of SRCs and their recovery needs seemed to encounter less severe identity disruptions. In contrast, Tara noted many instances with individuals at university who were not knowledgeable of SRC recovery needs and did not provide them with the guidance to support their recovery. Specifically, when Tara was asked to describe the SRC experience, Tara outlined how their professors seemed to be unaccommodating and/or unaware of how to support their SRC recovery, "The [university's] supports weren't the greatest. The professors would just eventually be like, 'Okay, where's your assignment?' They

wouldn't help you build new due dates around how long it might take you to do things at that point." Tara's experience appeared to contribute, in part, to an eventual disassociation from their university soccer team, athletic identity, and social identity as a student at their university.

Athletes appeared to discuss how members of their social groups provided social support in the form of promoting self-esteem (e.g., affirming their self-worth, ability as an athlete). Athletes also mentioned how this esteem promoting social support helped solidify their identity within the associated social group and help reduce disruptions to identity from their SRC. In particular, it seemed that Jamie alluded to how not receiving this form of social support impacted their athletic identity and self-concept. After Jamie was asked about the psychological and social implications of their SRC recovery, they responded by claiming that they felt pressure from their university swim coach to compete in a major swim competition before symptom resolution. Although Jamie decided to not go to this event, Jamie discussed how going to this event before they were recovered would have made them feel:

> *Jamie:* I'm going to come [to the swim meet] and I'm going to do poorly, and then feel worse. He [the coach] was suggesting that I just take it easy. Still come to the competition and compete, but not go as hard. I didn't want to do that because I knew that was going to just upset me more. …My times on the scoreboard would just be really embarrassing.

Based on the conversation with Jamie, we interpreted the coach's lack of esteem social support contributed to Jamie's disrupted sense of athletic identity and self-concept. However, Jamie was able to find esteem social support from teammates who supported Jamie's decision to avoid returning to sport too soon and having a disappointing performance. The esteem social support received from Jamie's university swimming teammates was interpreted to partially explain the importance on their social identity map (i.e., larger sticky note size) and connectedness (i.e.,

"10'/10 for Likert questions on connectedness, importance to identity, feeling good about group membership) with this group (i.e., "swim friends" group; See Appendix J). Further to Jamie's commentary and social identity map, CC noted in his reflexive journal that he greatly values self-esteem support and feels that this can easily impact individuals' perceptions of themselves and within their social groups. Together, we interpreted that the athletes who received social support from their social group members who improved their self-esteem expressed stronger connections to these associated social groups and less disruptions to their identity constructs.

Although there appeared to be a lack of instances where participants received tangible social support (e.g., financial support, assistance with daily living), there were a few athletes who mentioned when they did not receive this form of social support and how this impacted their identity disruption. For example, Olivia mentioned their struggles with the physical symptoms of their SRC recovery (e.g., headaches, intolerance to screens). When Olivia was asked about the recovery time after first sustaining the SRC, they mentioned that they were not receiving enough help from the university to accommodate their recovery needs:

> *Olivia:* I was the note taker for all my classes, so I got no notes. I had to scrounge around for notes. I couldn't use the Accessible Learning Centre's notes because I was it [the note taker]. …I needed super big font [for my exams]. The only annoying part was they didn't give you a larger sized scantron.

We interpreted from this comment and additional discussion with Olivia that the lack of tangible social support when needed impacted their viewpoint as a student and with their university. While CC also experienced his concussion during university, he was able to empathize and make the connection to how a lack of tangible support in this context can negatively impact perceptions of yourself, group members, and within your social groups. As such, with this

example and prior experience it appears that when athletes did not receive tangible social support that they needed with their SRC recovery and/or when recovered it further exacerbated their perceptions of identity disruption.

Other notable aspects of athletes' social identity and social network that appeared to influence identity disruption following SRC were negative perspectives of being a non-athlete and participating in elite sport as well as conflicting views with group members. With regards to negative perspectives of being a non-athlete, Tyler mentioned how their teammates and other university varsity friends negatively perceived individuals who were not a university athlete by calling them a "N.A.R.P." (i.e., non-athletic regular person). As such, when inquiring further about this term, Tyler stated:

> *CC:* Interesting, so there's almost like this negative connotation to being a N.A.R.P.?
>
> *Tyler:* Yeah. I think that is a by-product of someone ingraining the "varsityness" into their identity. Giving them a, I don't want to say a false sense of confidence because it is an accomplishment, but that kind of feeling of superiority.

Although Tyler appeared to be accepting of losing their elite athlete status (i.e., athletic identity) due to forced retirement, we interpreted that this perspective from their university soccer and varsity sport friends could be conflicting with their social identification with this social group.

Athletes who had pre-existing conflict with members of their social groups and/or conflict that was brought on by their SRC experience appeared to express how this contributed to identity disruption. For instance, Stella mentioned how members of their family disagreed with their decision to pursue an ice hockey career. We interpreted that Stella's two consecutive SRCs within the same season may have provided validation to their family members' perspective. As such, when asking Stella how the SRC experiences made them feel within their social groups,

Stella responded by claiming they felt the need to hide the truth and severity of SRC symptoms from their family, "As for my family, I always brushed it [the SRC] off. I didn't want them to worry, so I was like, 'Oh, I'm okay.' Meanwhile, I was going to doctors' appointments once a week." Therefore, we inferred that Stella's conflicting views with their family on their sport participation appeared to impact how they felt within their family group, their self-concept, and as an athlete (i.e., athletic identity).

In sum, participants' interactions with their social group members and individuals around them appeared to influence their perspectives of identity disruption. We inferred that a sport-focused social network with few and/or weak connections to non-sport related groups negatively contributed to identity disruption. Also, we inferred that when athletes received social support (i.e., belief that support was available, emotional support, guidance and knowledge support, esteem support, and tangible support) they experienced stronger connections to these individuals/social groups and discussed less disruptions to identity. Furthermore, two other aspects of athletes' social network that appeared to influence perspectives of their identity disruption were negative viewpoints of being a non-athlete and elite sport participation in general as well as when athletes had conflict (pre-existing and/or because of the SRC experience) with other members of their social network. Overall, athletes' social identity and the interactions with their social group members and individuals around them were interpreted to interplay on their perspectives of identity disruption from SRC recovery to when returned to sport/in retirement.

Discussion

The purpose of this study was to understand the impact of SRC on a sample of elite athletes' identity constructs (i.e., athletic, personal, and social identity, and self-concept). Our results describe how each of the athletes' identity constructs were disrupted during their SRC

recovery and return to sport/retirement experience. Additionally, the dynamics of athletes' social identity and social network appeared to influence their perceived disruptions to identity.

We found that SRC experiences were disruptive to athletes' various identity constructs (i.e., athletic, personal, and social identity, and self-concept). Previous research on identity and SRCs has examined this topic solely through the lens of athletic identity (Caron et al., 2021; Dean, 2019; Engström et al., 2020; Kroshus, Kubzansky, et al., 2015; O'Rourke et al., 2017). However, a closer examination of previous findings reveals that identity constructs beyond athletic identity have already been mentioned or inferred (Dean, 2019; Newton et al., 2020). Take, for example, the following statements from Dean's (2019) autoethnography about their own athletic identity disruptions that followed their SRC experience as a college lacrosse player: "I am not sure if I recognize myself anymore" (i.e., personal identity; p. 27), "It's now been months, or at least I think so. No sport. No social life. No Friends" (i.e., social identity; p. 25), and "I didn't know what life was beyond lacrosse" (i.e., self-concept; p. 26). Our interpretations of findings from Dean's (2019) study not only align with the findings from our study, but also with contemporary theoretical perspectives of identity (Sim et al., 2014). To help understand the impact of a salient social group (i.e., social identity) on the self-concept, Sim and colleagues (2014) analyzed and found support for the theoretical perspective *adaption account*, which explains that the self-concept may be more flexible to incorporate aspects of a salient social group, but personal identity remains relatively stable to the self-concept and actively displayed within their role in that salient group. Thus, in line with previous literature and theoretical perspectives, our results suggest that when an individual experiences a disruption to a salient social identity (e.g., an individual's athletic identity following SRC), other identity constructs (i.e., other social identities, personal identity, and the self-concept) could also be impacted.

Participants in this study appeared to largely define their self-concept as their athletic identity, which led some athletes to question what their self-concept might be without sport, a point that has previously been discussed or alluded to within sport psychology and SRC literature (Caron et al., 2021; Dean, 2019; Engström et al., 2020; Geary et al., 2022; Lamont-Mills & Christensen, 2006). For instance, researchers have previously discussed *athletic identity foreclosure* (Brewer & Petitpas, 2017; Good et al., 1993), which refers to a strong commitment to the athlete role without properly considering other potential identities. Beamon (2012) explored athletic identity foreclosure in 20 former elite athletes using ethnographic interviews. Among the findings, Beamon (2012) reported that 15/20 participants based most of their self-concept around their athletic identity—even in retirement. Additionally, 14/20 of the athletes in the study discussed difficulties with their transition out of sport, which they related to both self-concept and athletic identity foreclosure (Beamon, 2012). Results from our study support previous research on self-concept and identity foreclosure among athletes (Beamon, 2012; Houle et al., 2010), and extend our understanding of these concepts by adding results from a sample of elite athletes who lost a sense of who they are (i.e., disrupted self-concept) following SRC.

We also found that SRC experiences helped athletes develop a self-concept that was less defined by their athletic identity. Previous literature has outlined how sport injury and SRC experiences have led to a lesser reliance on athletic identity and promoted thinking about other identity constructs (Brewer et al., 2010; Engström et al., 2020; Everard et al., 2021; Perrier et al., 2014). For example, in a study by B. W. Brewer et al. (2010), they explored the self-protective changes (i.e., maintaining a positive perspective of the self-concept) to athletic identity following anterior cruciate ligament injury. The authors administered the AIMS at two time-points: pre-reconstructive operation and 24-months post-operation, and found that there was a significant

reduction in participants' athletic identity strength and exclusivity to their self-concept two years after surgery (Brewer et al., 2010). B. W. Brewer and colleagues (2010) conclude that a decrease in athletic identity may be an athlete's attempt to protect their self-esteem and self-concept. Another study from Engström and colleagues' (2020), which studied athletic identity disruption among elite ice hockey players who were forcibly retired due to SRCs, found that some athletes alluded to how their SRC experience made them prioritize other aspects of their self-concept, "Even though I had been completely rehabilitated, I might not recover from the next [concussion]. I have a responsibility to my family" (i.e., social identity in their family; Forming a post career identity section, para. 2). Taken together, our results appear to be in line with findings from B. W. Brewer et al. (2010) and Engström et al. (2020) as athletes may engage in self-protective mechanisms (i.e., developing a self-concept that is less defined by their athlete role) following SRC to maintain their self-esteem and a positive understanding of their self-concept.

Athletes in this study with a more diverse social identity (i.e., fewer sport-focused social groups with more and/or stronger connections to non-sport related social groups) reported experiencing less disruption to their identity constructs following SRC. A possible theoretical basis for this finding is *social identity complexity*, which is the degree of overlap between individual's various social identities (Roccas & Brewer, 2002). Roccas and Brewer (2002) noted that a low social identity complexity indicates high overlap between social identities, whereas high social identity complexity suggests that social identities are viewed more distinctly (Roccas & Brewer, 2002). The impact of social identity complexity can be observed in the study by C. Haslam et al. (2021), who explored the dynamics of social group membership on athletes' adjustment to life after losing their athletic identity due to retirement. The authors found that the addition of new group memberships after retirement and having multiple group memberships

before retirement helped with this adjustment (C. Haslam et al., 2021). Results from our study appear to add to previous literature by suggesting that athletes who have a more diverse and complex social identity may experience less identity disruption during their SRC recovery and return to sport/retirement experience. This finding suggests the importance for athletes to develop diverse social identities as well as sport stakeholders, which includes parents, coaches, and health care professionals, to help promote and support athletes' development of various social identities so they can better manage the inevitable identity disruptions that occur throughout sport participation.

Athletes in this study who reported receiving *social support* from their social group members and the individuals around them, seemed to encounter less identity disruptions as a result of their SRC. Bianco and Eklund (2001) defined social support as "social interactions aimed at inducing positive outcomes" (p. 85). Researchers have noted that social support encompasses three key aspects: a) *appraisal/perceived* (i.e., individuals' belief that support is available to them), b) *structural* (i.e., number and type of social groups available for support), and c) *functional* (i.e., the provided emotional, informational, esteem, and tangible support; Bianco & Eklund, 2001; Freeman, 2021; Gottlieb & Bergen, 2010; Rees & Hardy, 2000). Social support has shown to impact the psychological and social wellbeing among injured and concussed athletes at all levels (André-Morin et al., 2017; C. J. Brown et al., 2018; Caron et al., 2021; Clement & Shannon, 2011; Hassell et al., 2010). In a recent study by C. J. Brown and colleagues (2018), they explored how social support influences elite athletes' transition out of sport following retirement through semi-structured interviews. Researchers found that athletes expressed that social support received from their friends, family, mentors, and sport (e.g., teammates, coaches) helped them redefine their athletic identity in retirement, reappraise their

self-concept, and reaffirm their self-esteem and self-worth (C. J. Brown et al., 2018). We can interpret from this study that social support can influence athletes' understanding of their various identity constructs (i.e., athletic, personal, and social identity, and self-concept) and feelings of self-worth and self-esteem during threats to identity, such as sport retirement. Thus, when concussed athletes are in a time of need (i.e., suffering SRC symptoms, initially returning to sport, entering retirement), social support from their social group members could potentially reduce and help manage perceived identity disruptions from their SRC experiences.

Our results also indicated that the social *group dynamics* and the disruptions to athletes' social group roles following SRC impacted perceived threats and changes to identity. Group dynamics has been defined as "The actions, processes, and changes that occur within and between groups" (Forsyth, 2014, p. 2), and the interplay between individuals' social group dynamics and identity disruption from injury can be observed within previous literature (Caron et al., 2021; Muldoon et al., 2019; Surya et al., 2015). For example, Surya and colleagues (2015) explored athletes' perceptions of their team's group dynamics and group interactions after their own or a teammate's injury. Part of Surya and colleagues' (2015) findings included how healthy teammates' roles changed to fill the role of the injured teammate, which created tension within the team when multiple players were competing for this role as well as upon the injured teammates return. Additionally, with the injured athlete unable to fill their regular role while recovering, they expressed either finding a new temporary identity within the team (e.g., taking on a more vocal leadership role) or by accepting the injured role identity (Surya et al., 2015). We can interpret from this study by Surya and colleagues (2015) that injury experiences are influenced by social group dynamics and the role changes that not only occur within the injured athlete, but also with the individuals around them. In relation to our study, the dynamics of

athletes' various social groups may contribute either positively or negatively to athletes' identity constructs following SRC. Thus, individuals within athletes' social network should be aware of the potential for role changes and disruptions to group dynamics following SRC, including its implications for athletes' recovery and return to sport/in retirement.

Strengths and Limitations

The first strength of this study was the use of the Social Identity Approach (Hogg, 2020; Hornsey, 2008; Trepte & Loy, 2017) to study identity disruption from SRC experiences. We believe this allowed us to gain a more comprehensive, and thus better, understanding of how disruptions to one identity construct can impact other aspects of identity. A second strength was the use of multiple methods of data collection. A recent review of qualitative studies in sport psychology found that researchers rarely use multiple methods of data collection (McGannon et al., 2019), which is unfortunate because using multiple methods helps researchers gain additional insight into the phenomenon (Braun et al., 2017; Carter et al., 2014; Darbyshire et al., 2005). We used a combination of semi-structured interviews and the SIM (Bentley et al., 2020; Cruwys et al., 2016). Researchers have also found in recent years that less than 4% of qualitative studies in sport psychology use some form of visual data collection method (McGannon et al., 2019). We believe that the additional use of the SIM allowed us to obtain richer insights into the athletes' social identity and be able to better understand athletes' identity disruptions following SRC.

A first potential limitation is that this entire research project was conducted during the COVID-19 pandemic. As such, we cannot be certain how the pandemic impacted athletes' perceptions of their identity disruptions following SRC. A second limitation was that we only obtained social identity maps from participants after they had recovered and/or retired. Being able to compare pre- and post-SRC social identity maps would have been helpful to better

understand changes that occurred to athletes' social identity and social network. A third limitation of this study was the lack of sex or gender comparison. Out of the seven participants, six identified their sex as being female, and we did not obtain gender orientation from participants. As such, we were not able to obtain sex and gender specific implications on SRC experiences and identity disruption. A comparison of sex and gender may provide additional insights, as previous studies display that females are typically underrepresented in concussion literature (D'Lauro et al., 2022), and female elite athletes generally report lower AIMS scores, with the exception of exclusivity, than males (Lamont-Mills & Christensen, 2006). A fourth and final limitation of this study is the participant group consisted of only Caucasian individuals. Although we did not set out to better understand identity disruption following SRC in relation to ethnicity, this lack of diversity may have prevented the discussion of cultural and/or ethnic connections to identity disruptions from SRCs. Not only are ethnic minorities also underrepresented in sport (Renton et al., 2021) and within the academic literature (Roberts et al., 2020), ethnic-specific differences have also been observed in the athletic identity literature. Beamon (2012) explored athletic identity foreclosure and athletic identity disruption in former African American elite athletes and found that many of the participants felt that athletics were important for black children as it is often implied that it is the only way they will "make it" in life as well as they felt their white friends didn't experience the same implied pressure (Beamon, 2012). Previous athletic identity literature, such as Beamon (2012) supports the need to explore ethnic and cultural differences in SRC experiences on identity disruption in elite athletes.

Chapter 3

Conclusion

Guided by the Social Identity Approach (Hogg, 2020; Hornsey, 2008; Trepte & Loy, 2017), this study explored seven elite athletes' SRC experiences and the impact of this SRC experience on their various identity constructs (i.e., athletic, personal, and social identity, and self-concept). Findings from this study provides support for previous literature that SRCs are disruptive for athletic identity (Caron et al., 2021; Dean, 2019; Engström et al., 2020). However, our study extends previous literature by suggesting that other identity constructs (i.e., personal, and social identity, and self-concept) may also be disrupted following SRC. Similar to previous research, participants' perceptions of their self-concept appeared to be largely defined by their athletic identity (Caron et al., 2021; Dean, 2019; Engström et al., 2020; Geary et al., 2022; Lamont-Mills & Christensen, 2006). However, we also found that experiencing SRC helped some to redefine their self-concept to be less focused on their athletic role. Finally, based on our conversations with the athletes, it appears that having a supportive and diverse social identity and social network (i.e., a less sport-focused social network with more and/or stronger connections to non-sport related social groups) helped manage and reduce perceptions of identity disruption.

Based on the findings from this study we suggest a few possible directions for future research. First, we suggest that researchers explore additional identity theoretical perspectives to help understand the nuances that may underpin these identity disruptions from SRC experience. One suggestion is *identity fusion* (Swann Jr. et al., 2012), which describes how a strong sense of "oneness" with a salient social group may create significant overlap between personal identity and the social identity of that salient group whereby activating or disrupting one of these identity constructs may activate or disrupt the other. A second suggestion involves a longitudinal

investigation to comprehensively study how and when identity disruption occurs throughout SRC experience, as well as the factors that helped or hindered athletes' identity disruption (Caruana et al., 2015; Menard, 2002; Smith & Sparkes, 2016b). For example, Cascagnette et al. (2021) explored how perceptions of team environment and team cohesiveness influenced athletes' social identity and experiences on an elite Nordic ski team over the course of one season. Part of the researchers data collection included using the SIM at three different time points within the season to be able to assess changes to social identity and social network connectedness more accurately and critically (Cascagnette et al., 2021). A third suggestion includes exploring the distinction between professional and elite amateur athletes. While many elite athletes compete professionally and use sport as their career (e.g., National Hockey League, Women's National Basketball Association), many compete as amateurs and do not use sport as their primary source of income (e.g., university/collegiate athletes). As such, better accounting for differences between amateur and professional elite sport in future samples may provide unique differences in the athletes' potential identity disruption from SRC. Although this is just one example, it is possible that there are differing dynamics that exist between amateur and professional elite sport that may influence how athletes' identity is disrupted following SRC. A fourth and final suggestion for future research is to explore identity disruption management strategies and tools. For instance, researchers suggest the use of the SIM as a tool for intervention on identity disruption as identity visualization and increasing one's sense of belonginess and connectedness to their important social groups may help with disruptions to identity, such as social isolation, anxiety, and depression (C. Haslam et al., 2016, 2019; O'Rourke et al., 2018; Walton et al., 2014). Hopefully, some of these suggestions will help guide future research and treatment efforts by helping athletes suffering from SRCs to better manage

their identity disruption following SRC, and succeed in returning to school, sport, and their various social groups.

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Appendix A

Participant Demographics

Table 1

Participant demographics

Athlete	Sex (M/F)	Age	Ethnicity	Sport	Elite athlete classification	Current playing status	Return to sport outcome
Tara	F	23	Caucasian	Soccer	Semi-elite	Retired	Forced retirement
Olivia	F	24	Caucasian	Curling	Semi-elite	Retired	Returned
Stella	F	24	Caucasian	Ice hockey	Competitive-elite	Active	Returned
Tyler	M	22	Caucasian	Soccer	Semi-elite	Retired	Forced retirement*
Jamie	F	24	Caucasian	Swimming	Semi-elite	Retired	Returned
Jessica	F	27	Caucasian	Swimming	Semi-elite	Retired	Returned
Larissa	F	32	Caucasian	Ice hockey	Successful-elite	Retired	Forced retirement after 4th SRC

Note: *Tyler experienced a concussion unrelated to sport that forced them into retirement before their return to sport in their second season as a semi-elite athlete

Appendix B

Participant Profiles

Table 2

Participant profiles

Athlete	Identity profile
Tara	Former semi-elite soccer player at the collegiate level who sustained a career ending SRC during their first season at this level. *Personal identity:* Kind, reliable, supportive, funny, gets along with others easily, enjoys helping and comforting others, open-minded, approachable, laidback, and humble. *Athletic identity:* Tenacious, leadership qualities, highly skilled, often disliked by opponents, and a team player. *Social Identity:* Described their social network as large with strong positive connections throughout. Their current social network (See Appendix F) consisted of school friends (i.e., "elementary/high school/university friends"), "gym friends," childhood "soccer team" friends, and "family" (includes their family, their significant other's family, and their best friend). However, the athlete expressed having negative experiences related to their now estranged collegiate soccer team.
Olivia	Former semi-elite curler at the university level who sustained SRC during their second season at this level, which left them out of sport for approximately 2-3 months. *Personal identity:* Anxious, extroverted-introvert, quiet, unique, finds it difficult to relate and connect with others, and enjoys keeping busy. *Athletic identity:* Friendly, nice, a team player, open-minded, introverted, task oriented, and usually passive with their team's decision-making during games. *Social identity:* Described their current social network as diverse, but also limited due to finding it difficult to create meaningful connections with others. Olivia also mentioned notable pre-SRC and ongoing tension and conflict with members of their family. Their current social network (See Appendix G) included their "family," "school exchange friends," two separate "university friend" groups, online friend groups (i.e., "music artist Discord" group and "Reddit" group), two separate "work groups," and their current recreational "curling" team.
Stella	Active competitive-elite ice hockey player who sustained two consecutive SRCs within the same season (i.e., fifth season at this level), which left them out of play for 5 months, collectively (i.e., 8 weeks for the first concussion and 3 months for the second). *Personal identity:* Bubbly, happy, friendly, positive-minded, enjoys joking around, independent, and a music lover. *Athletic identity:* Lighthearted, friends with everyone, a role model, communicative,

	understanding, a good "go-to" player, and always laughing and joking around. *Social identity:* Described as having strong positive connections with their current social network, but also mentioned tension with friends who act in a way where association with them might jeopardize their ice hockey career and image. Additionally, Stella mentioned conflict between members of their family who disagreed with their decision to pursue an ice hockey career causing additional stress and contention with their identity as an athlete. Their current social network (See Appendix H) included their "family," 'best friends," hometown and school "friends," their "current elite level hockey team," and their hometown community (not depicted on their social identity map).
Tyler	Former semi-elite soccer player at the university level who sustained SRC at the beginning of their first season at this level, which left them out of play for the entire season. However, at the beginning of their second season when they returned to sport, they sustained a career ending concussion unrelated to sport. *Personal identity:* Outgoing, easygoing, always joking around, composed, well-tempered, lighthearted, and tends to not take themselves too seriously. *Athletic identity:* similar to their personal identity, but also confident, self-assured, hardworking, easygoing, positive attitude, a good teammate, and always joking around. *Social Identity:* Described their current social network (See Appendix I) as a close tight-knit circle that included social groups consisting of their "family," childhood and university "friends" (including their partner), their current recreational "soccer" team, and their current healthcare clinic job "coworkers."
Jamie	Former semi-elite swimmer at the university level who sustained SRC during their third season at this level, which left them out of play for slightly over 1 month. *Personal identity:* Patient, empathetic, a good listener, shy, quiet, reserved, sociable at times, hardworking, dedicated, responsible, understanding, someone who enjoys helping and working with others, passive, too nice, not very assertive, quirky, goofy, and caring. *Athletic identity: S*imilar to their personal identity with the added characteristics of athletic with leadership qualities. *Social identity:* Described their social connections to their group members as being positive, loving, and caring. However, also mentioned there was tension and conflict within their family, which impacted their identification with this group. While most of their social network (See Appendix J) was rooted in swimming, their social groups consisted of "family," university and childhood "swim friends," their current adult recreational "masters swim group," and their "coworkers."
Jessica	Former semi-elite swimmer at the university level who sustained SRC in their second season at this level, which left them out of play for approximately 4 months. *Personal identity:* "Type A" personality, controlling, efficient and organized, competitive, someone who values their personal relationships, goofy, loud, talkative, confident, but professional and serious when needed. *Athletic identity:* A leader, competitive, comfortable, social, supportive, and at times professional, serious, strict, and intimidating. *Social identity:* Described their social network as being very swimming related with a few exceptions. Also, they generally felt their social network was important to them with

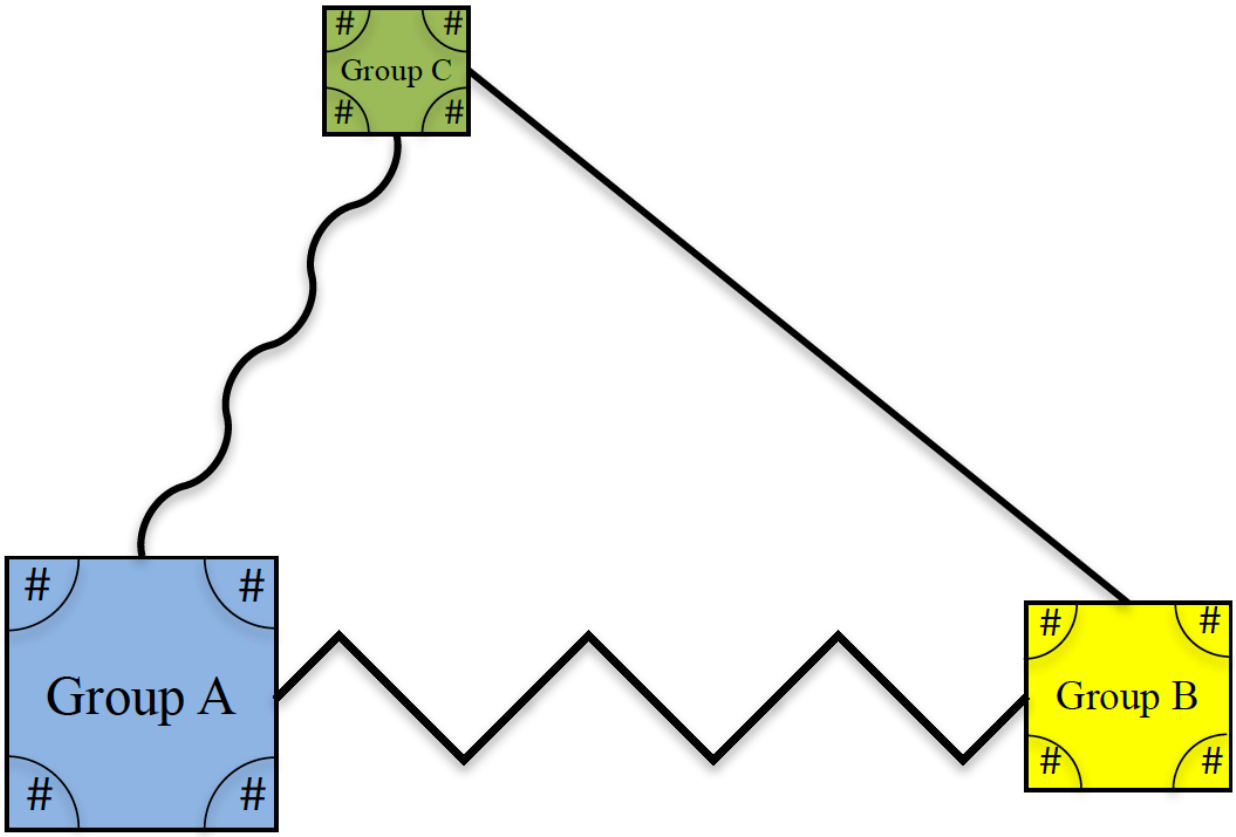
	strong deep connections. Their social network (See Appendix K) consisted of their "family" (both their family and their partner's), "university swim alumni" friends, "childhood school friends," and their current "swim coach job."
Larissa	Former successful-elite ice hockey player who sustained four documented SRCs as an elite-athlete with their fourth one being career ending. The approximate timeline for recovery for these SRCs were 3-4 weeks, 2 weeks, approximately 1 month (athlete mentioned they rushed their recovery and returned before symptom resolution), and career ending, respectively. *Personal identity:* Very introverted, shy, driven, a good leader, positive, energetic, sensitive, laidback, and at times a social extroverted-introvert. *Athletic identity:* Similar to their personal identity, but with the added characteristics of being a workaholic/hardworking, team oriented, morally good, detail oriented, focused, coachable, and holding themselves to a high standard. *Social identity:* Described their social network as being large and mostly related to ice hockey, but also felt in many cases it was either difficult to maintain contact with their social groups or they didn't have strong relationships with them. Their current social network (See Appendix L) consisted of their "family," their "partner" and their "partner's family," various ice hockey friend groups (i.e., "pro hockey team 1 and 2," "provincial hockey team," "college hockey alumni," and childhood "friends [from hockey]"), coaching related ice hockey social groups (i.e., "youth hockey team," "college hockey staff," and "coworkers college hockey"), and their "high school friends."

Appendix C

Social Identity Mapping Tool Abbreviated Guide

Figure 1

Social Identity Mapping Tool abbreviated guide



Note: Exemplar Social Identity Mapping Tool (SIM) from Cruwys et al., (2016) in their Appendix S1. Each box indicates a social group/social identity that the individual holds and associates with. There are four main components: 1) size of each box represents the salience of each group membership (i.e., larger the box, the more important the group is perceived to the individuals identity constructs), 2) the numbers in the corners of each box indicate individuals responses to questions about that specific group involvement on Likert scales; questions are specific to the study and can be fully adapted for study's objective, 3) proximity between groups represents similarity (i.e., the more similar a group is perceived to another, the closer groups are and vice versa), and 4) lines connecting the groups indicate group compatibility (i.e., no line means zero compatibility with a compatibility line range between a solid line as highly compatible to a heavily jagged line as very little compatibility). Note: this is a shortened protocol by Cruwys et al., (2016) with adaptations from the online version protocol by Bentley et al. (2020).

Appendix D

Elite Athlete Semi-Structured Interview #1 Guide

Pre-interview

- Introduction & build rapport.

- Review information and consent form.

Main Interview Questions

- Demographic questions (Date of birth, sex, ethnicity, educational background, history with sport participation and current team involved with [or most recently involved with at the elite level, if retired], and injury history in sport).

- Describe your experience with concussions.
    - Duration of your recovery, severity of symptoms (physical, psychological, social, etc.).
    - Challenges with recovery and return to sport.

- How would you describe yourself to someone else? In the sport context?
    - How do you think others describe you? In the sport context?

- How would you describe your social network and the groups you are involved with?
    - What are the important social groups in your life? What are some less important groups?
    - How do you think these social groups impact how you view yourself?

- How do you think, if at all, your concussion(s) impacted how you viewed yourself at the time of the injury?
    - Since then, do you think your concussion experience(s) have continued to impact the way you think about yourself? Or how others think about you?
    - How do you think your concussion impacted your identity with your sport team or other groups that you are involved in?

Summary Questions

- Is there anything else you would like to add to our conversation?

- Do you have any questions or comments for me?

Post-interview

- Briefly explain the SIM and protocol.

Appendix E

Elite Athlete Semi-Structured Interview #2 Guide

Pre-interview

- Provide a summary and review of interview #1. Do you have any questions or comments that you would like to add?

- Review the SIM protocol and have participant complete the SIM.

Main Interview Questions

- How did this exercise make you think about your identity?
    - If at all, how did this exercise change how you viewed yourself?
    - How did the SIM impact the way you viewed your concussion experience?

- Looking at the different groups or identities that are important to you, which were most impacted by your concussion experiences?
    - Did your sense of belonging to any of these identities or groups shift or change as a result of your concussion?
    - If you feel as if any identities or groups were lost, describe the details surroundings these lost identities or groups.

- How do you think a tool or activity like this might help athletes struggling with an identity disruption from their concussion experience? What else you would suggest?

- If you could go back in time, what type of advice would you give to yourself about your concussion recovery and return to sport?

Summary Questions

- Would you like to add any information to our discussion about your concussion experiences?

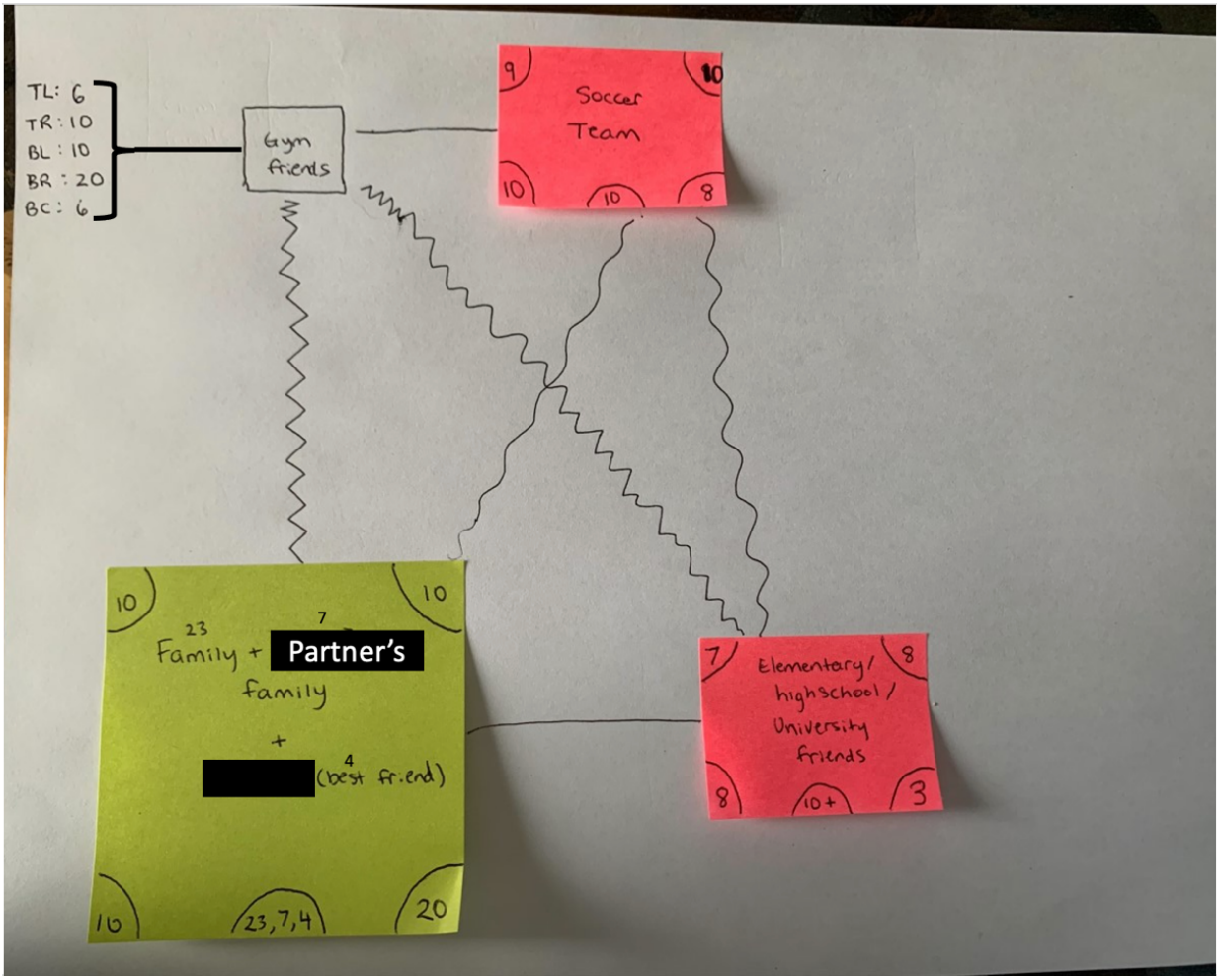
- Do you have any other questions or comments?

Appendix F

Tara's Social Identity Map

Figure 2

Tara's present Social Identity Map from the Social Identity Mapping Tool; semi-elite soccer player

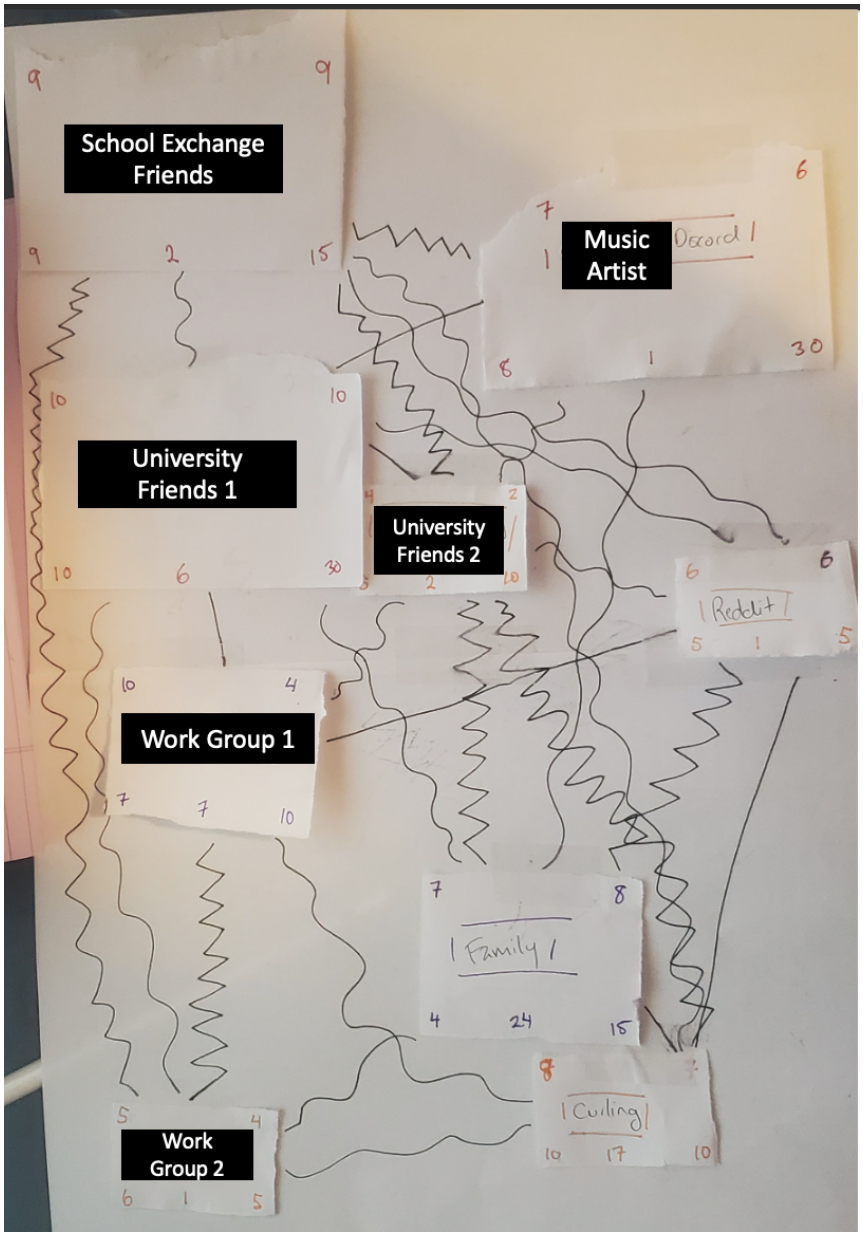


Appendix G

Olivia's Social Identity Map

Figure 3

Olivia's present Social Identity Map from the Social Identity Mapping Tool; semi-elite curler

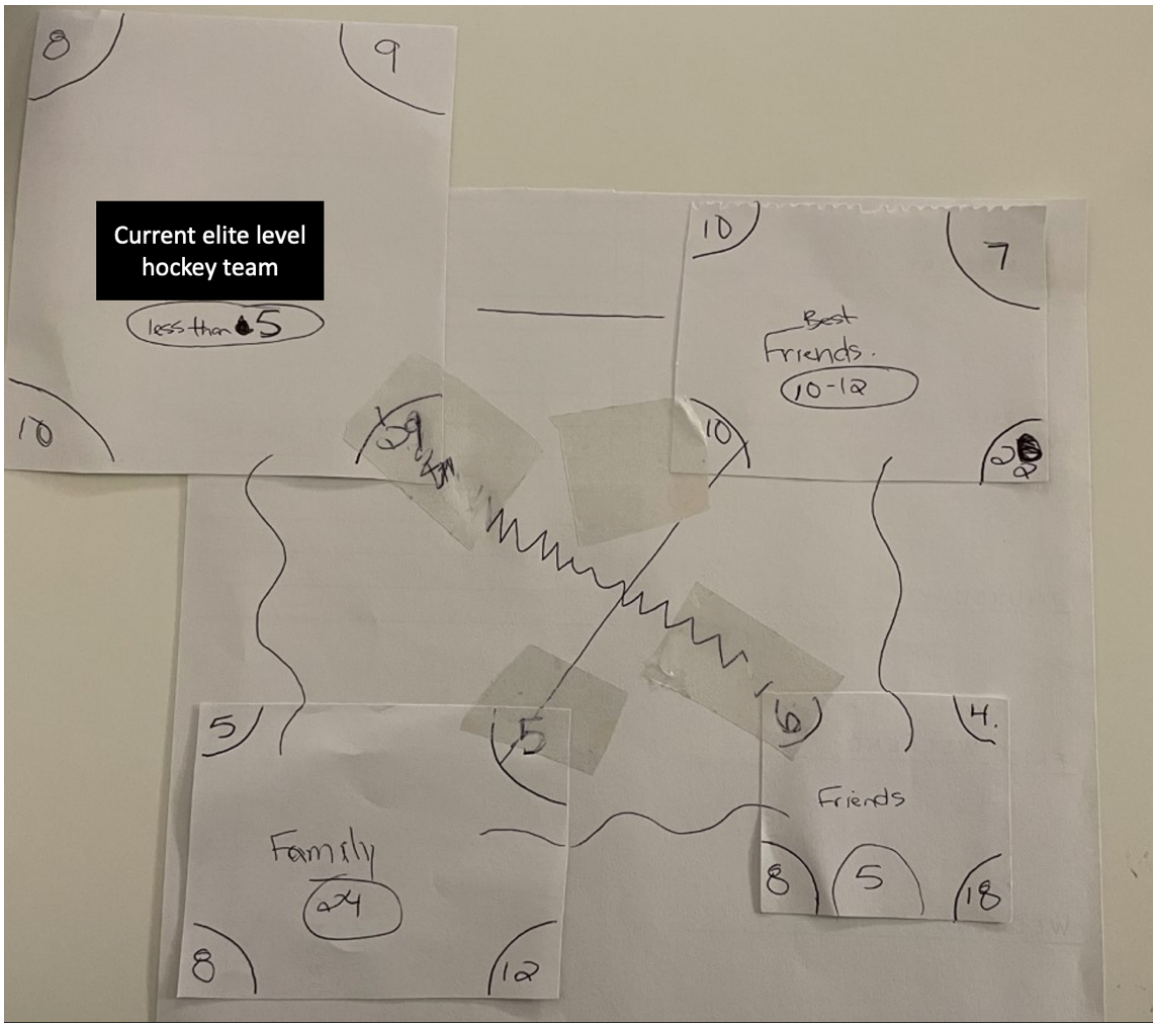


Appendix H

Stella's Social Identity Map

Figure 4

Stella's present Social Identity Map from the Social Identity Mapping Tool; competitive-elite ice hockey player

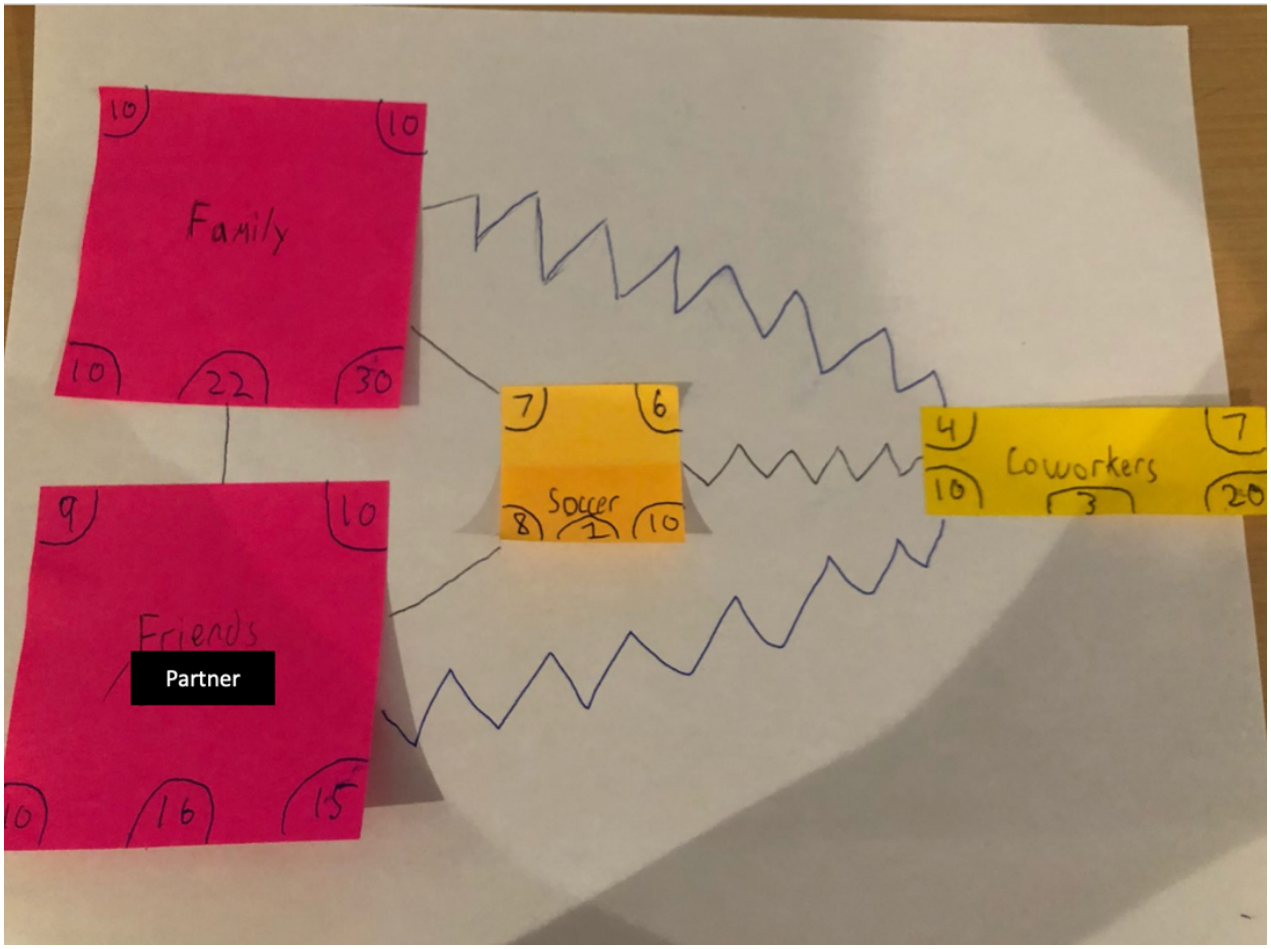


Appendix I

Tyler's Social Identity Map

Figure 5

Tyler's present Social Identity Map from the Social Identity Mapping Tool; semi-elite soccer player

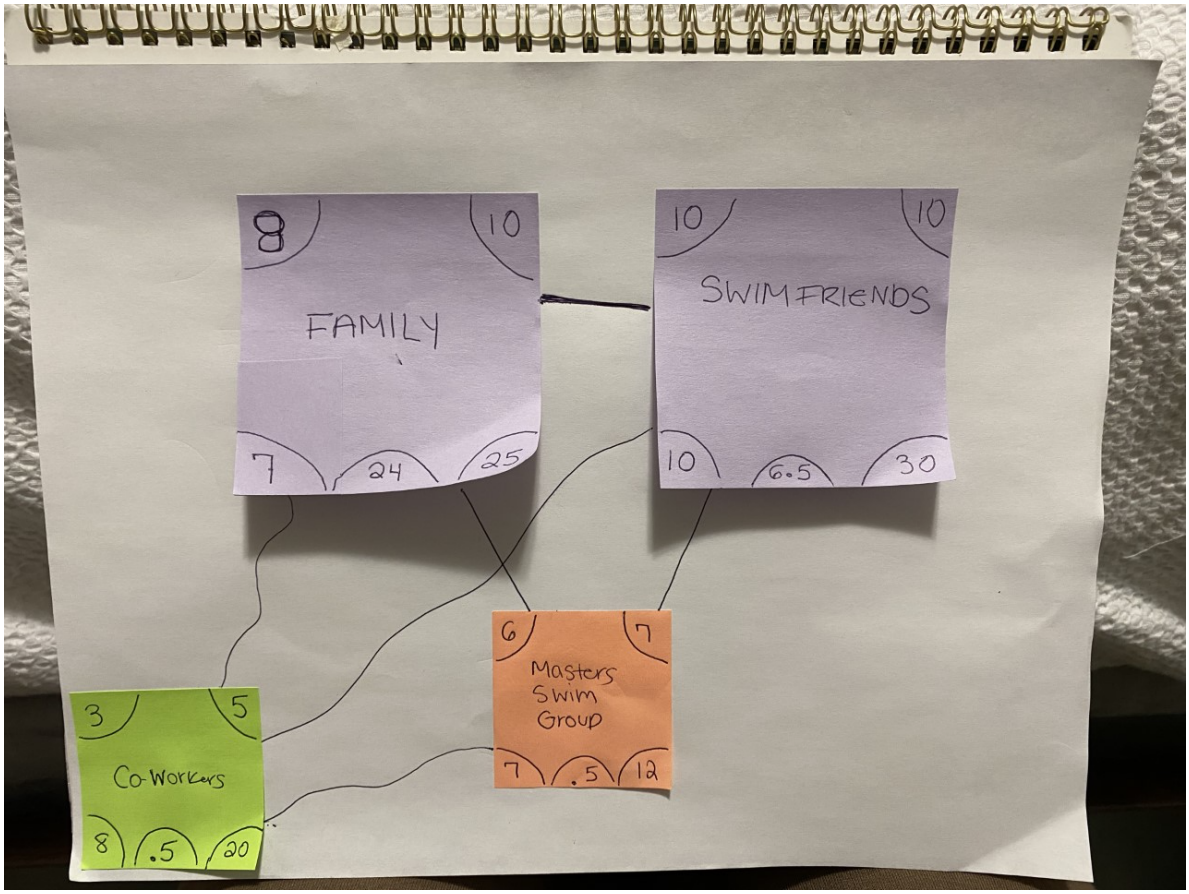


Appendix J

Jamie's Social Identity Map

Figure 6

Jamie's present Social Identity Map from the Social Identity Mapping Tool; semi-elite swimmer

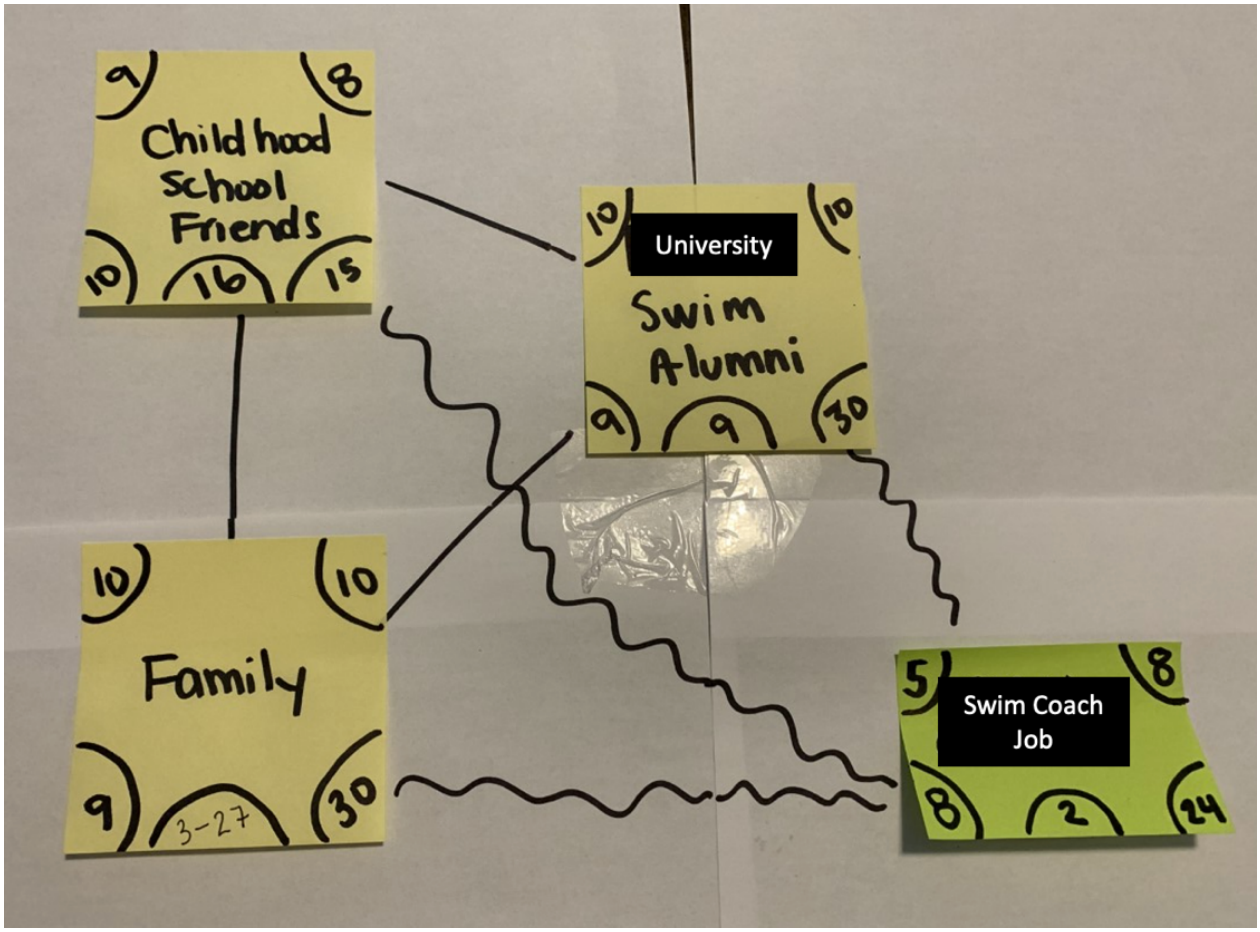


Appendix K

Jessica's Social Identity Map

Figure 7

Jessica's present Social Identity Map from the Social Identity Mapping Tool; semi-elite swimmer

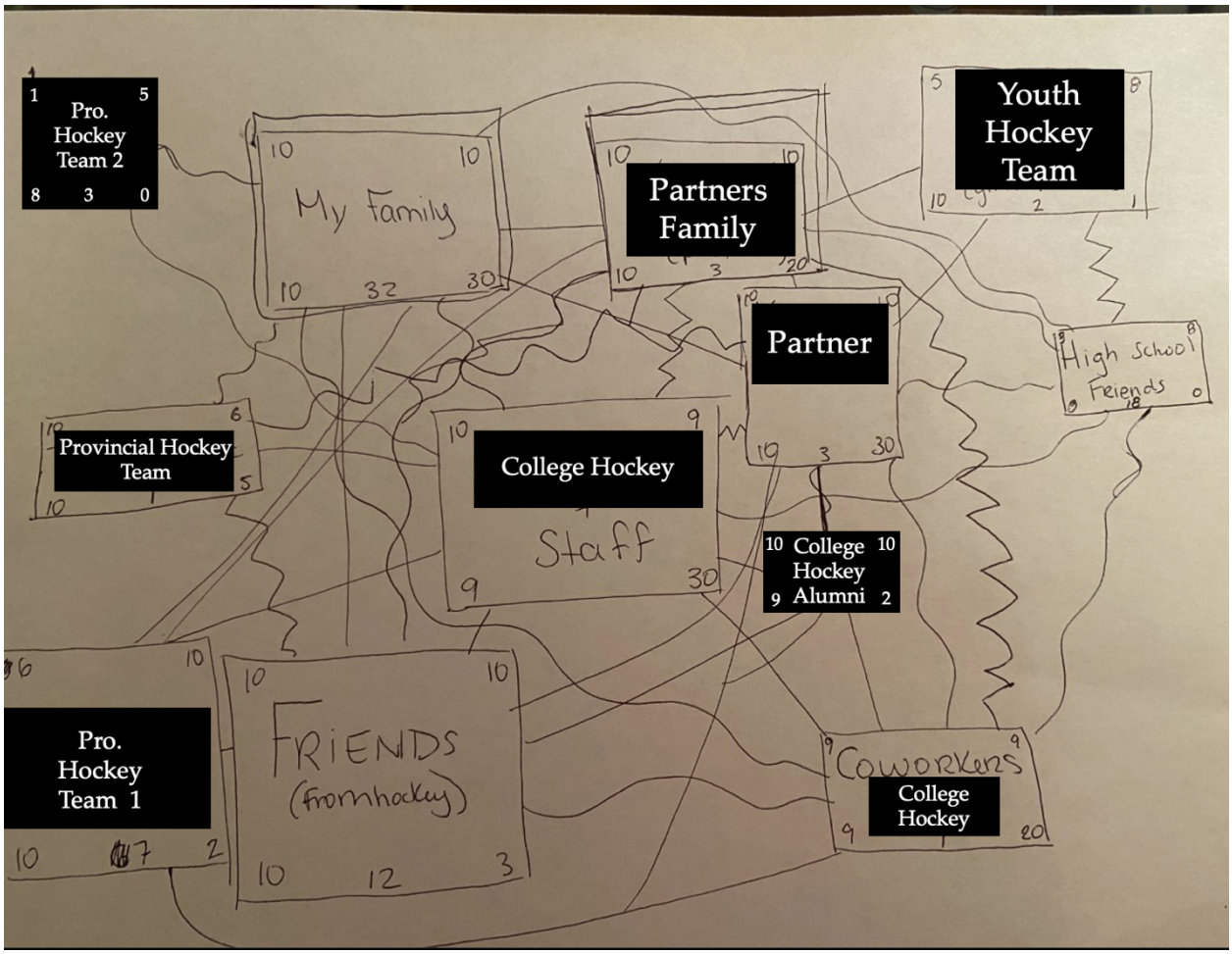


Appendix L

Larissa's Social Identity Map

Figure 8

Larissa's present Social Identity Map from the Social Identity Mapping Tool; successful-elite ice hockey player



Appendix M

Overview of Developed Themes

Table 3

First-, second-, and third-level themes along with their descriptions developed within this study

First-level theme	Second-level theme	Third-level theme	Second-/Third-level theme description
(A) SRC Experience Threatening the Self-Concept	Impacting a valued athletic identity		Participants mentioned that the athlete status and being an athlete contributed to their development as an individual and was important to how they viewed themselves. Maintaining their athletic identity and sport participation often took precedence in their lives (i.e., growing up, while competing, and during the SRC experiences). Negative emotions (i.e., sadness, fear, frustration) were reported by athletes when discussing their removal from sport and the associated social groups due to their SRC experience during recovery.
	Feeling like a different person		Disruptions to athletes' personal identity as a result of their SRC experience during their SRC recovery included general feelings of being a different person, alterations to cognitive functioning, and mood/emotional changes.
	Difficulty managing social status and network		Athletes mentioned the difficulties of gaining new social groups as well as managing and maintaining their roles and status within their various social groups outside of sport (e.g., school, friend groups, family) during SRC recovery. Specifically, athletes discussed general difficulties managing their social roles/groups, feeling limited in their ability to interact with their social network due to the SRC symptoms, feeling isolated from their social network, and internal (i.e., from themselves) and external (i.e., from others) pressures to return to their pre-injury identity.

	Prolonged identity change and acceptance		Despite some athletes discussing that their identity is fluid and bound to change over the course lives regardless of injury, participants expressed changes to their identity constructs that continued to impact them in various avenues of their life for weeks, months, to years when recovered and/or retired.
(B) Post-Concussion Identity	Acknowledging life beyond sport		Athletes mentioned how their SRC experience(s) helped them develop a new self-concept that was less defined by their athletic identity when recovered and/or retired. For athletes who knew that they would be retiring by a certain time (e.g., end of college/university), had thought about the end of their career, and/or expressed a perceived lack of strong athletic identity seemed to be more accepting of losing their elite athletic identity status.
	Reforming a new athletic identity in retirement		Athletes who were forcibly retired from their SRC felt like they needed to develop a new athletic identity in retirement (e.g., participation in lower-level sport, coaching), whereas others felt there was a period where they needed to disassociate from sport and physical activity altogether.
(C) Identity Management Through Social Identity	Social support influencing identity disruption	Perceived Social Support	Athletes found that a lack of social support, a lack of understanding about SRC recovery, and general conflict with members of their social network negatively impacted their perceptions of their identity constructs and contributed to their identity disruption during their SRC experience. Conversely, athletes felt that when they believed there was social support available to them and when they received emotional, guidance and knowledge, esteem, and/or tangible social support they perceived less disruptions to their identity constructs from their SRC experience.
		Social identity diversity	Athletes who appeared to have a more diverse social network and social identity perceived less identity disruption during their SRC recovery and when recovered/in retirement.

The role of group dynamics	Athletes discussed how the various dynamics of their team, their sport in general, and within their social groups before, during, and after their SRC experience impacted identity disruption from their SRC(s). More specifically, athletes outlined the changes to their roles within their social groups and how this impacted their perceptions of identity disruption.