

Running head: VARSITY FOOTBALL STUDENT-ATHLETES WITH A SPORT-RELATED CONCUSSION

Constraints and Facilitators in Academic and Athletic Settings for Varsity Football Student-Athletes with a Sport-Related Concussion

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### Abstract

Sports-related concussions are a growing public health concern affecting numerous varsity football student-athletes. This study used the social ecological model to identify intrapersonal, interpersonal, and environmental factors. The purpose of this study is to identify constraints and facilitators in academic and athletic settings for varsity football student-athletes with a sport-related concussion. Twelve current varsity football student-athletes from one institution who suffered a sport-related concussion took part in semi-structured interviews. Data were thematically analyzed. Results indicate that varsity football student-athletes with a sport-related concussion perceived numerous constraining and facilitating social ecological factors in the academic and athletic settings. Intrapersonal constraints revolved around loss of motivation, loss of social identification, stress, anxiety and depression, injury-specific issues (i.e. difficulty thinking clearly, remembering, drowsiness), internal pressure to return, while intrapersonal facilitators included prior experiences of enjoyment in academic and athletic activities, seeing improvements in the recovery process, and not giving up. Interpersonal constraints related to insufficient social support, lack of awareness and guidance on concussion knowledge, external pressure to return, and lack of academic support post-concussion, while interpersonal facilitators included passionate therapy staff, and sport psychologist. Environmental constraints pertained to return-to-play and return-to-learn protocols, while environmental facilitators included having access to concussion-based resources. Findings suggest that there remains a need to address constraining and facilitating factors in the academic and athletic settings for varsity football student-athletes with a sport-related concussion.

## Chapter 1

### **Introduction**

Sport in today's society includes a vast number of athletes participating in a variety of youth, high school, university, professional, and recreational sports. Participation in sport has been associated with benefits to overall quality of life, cognitive development, physical, social, and psychological health (Carron, Hausenblas, & Estabrooks, 2003). For instance, a social support network derived through participation in university athletics could lead to a greater quality of life in the university environment because social support is claimed to positively influence an individual's emotions, cognitions, behaviours, and both adherence and compliance to activity programs (Carron et al., 2003). As well, participating in sport has been shown to reduce the risk of heart disease, cancer, stress, anxiety, and depression and has been shown to improve overall body composition. Although participating in sport provides abundant benefits, participating in sport carries the risk of injury. While there is no universal definition of a sport injury, participating in sport exposes athletes to the risk of sustaining a wide variety of head, bone, ligament, tendon, and nerve injuries, triggered by direct trauma and/or repetitive stress (Powell, 2001). The risk of injury derives from the nature of the sport and the specific activities of the participant. For example, contact sports such as football inherently have more acute traumatic injuries as opposed to sports such as swimming and sprinting (Powell, 2001). When a student-athlete sustains a serious injury, what are the academic and athletic impacts? Moreover, what are the academic and athletic challenges of a sport-related concussion for varsity athletes?

Injury patterns in sport tend to be catered towards the specific sport. Concussion is an injury typically associated with sport and is often identified with football (Kontos et al., 2013). In

spite of evolutionary developments in protective equipment, head injuries remain prevalent in football. Due to the combination of high speeds and full contact, football players are susceptible to a variety of injuries during games and/or practice. Common injuries football players suffer are head injuries and ligament injuries (Kontos et al., 2013). These types of injuries have the potential to negatively affect a student-athlete's involvement in the classroom, and on the playing field.

Sport-related concussions are a growing concern affecting a large number of student-athletes. According to the Centers for Disease Control and the Brain Injury Research Institute, about 1.6 to 3.8 million individuals suffer from a sport-related concussions in the United States (Satarasinghe, Hamilton, Buchanan, & Koltz, 2019). In addition, according to Brain Injury Canada (2019), brain injuries currently impact 1.5 million Canadians, another 160,000 Canadians experience a brain injury every year. Specifically, sport-related concussion in the sport of football has gained significant attention largely due to several professional athletes who have died from chronic traumatic encephalopathy (Yi, Padalino, Chin, Montenegro, & Cantu, 2013). Furthermore, due to the rigorous schedule of a varsity football student-athlete, there can be missed classes due to team travel obligations, late nights as a result of game and/or practice schedule, and inconsistent eating and sleeping patterns (Kontos et al., 2013). This schedule becomes more challenging to manage for student-athletes who are suffering and recovering from a sport-related concussion. It is thus essential for coaches, and educators to recognize the potential constraints an injury can pose on regular academic and athletic activities (Kontos et al., 2013). To better understand the potential that an injury can pose on student-athletes, the focus of this research study will identify constraints and facilitators in the academic and athletic settings for varsity football student-athletes with a sport-related concussion.

### **Purpose of Study**

The purpose of this study is to identify constraints and facilitators in academic and athletic settings for varsity football student-athletes with a sport-related concussion.

### **Objectives**

1. To identify intrapersonal, interpersonal, and environmental constraints and facilitators in the academic and athletic settings for varsity football student-athletes with a sports-related concussion.
2. To explore strategies how varsity football student-athletes continue academic and athletic endeavours following a sport-related concussion.
3. To examine the effectiveness of current returning-to-play, and returning-to-learn protocols for varsity football student-athletes.

### **Importance of Study**

The study is one of the few produced from a qualitative Canadian-based perspective to identify the constraints and facilitators in academic and athletic settings for university level varsity football student-athletes with a sport-related concussion. The study will make a unique contribution to research as it will help improve the service industry, the way preparation and training precautions take place for a student-athlete pre and post-concussion diagnosis, and it will further understanding on existing guidelines and policies in place regarding returning-to-play and returning-to-learn protocols for student-athletes recovering from a sport-related concussion.

The findings of this study have the potential to benefit society considering that concussion based research is gaining significant momentum following recent insight into the severe detriments a concussion can pose. Thus, academic and athletic officials, student-athletes, and researchers can apply the recommended approach derived from the findings of this study to educate, raise awareness, and support student-athletes who sustained a sport-related concussion. Additionally, the study has the potential to help uncover critical areas in the academic and athletic process for students returning to the classroom and on the playing field.

Moreover, studies that do explore the impacts of concussion have been predominately focused on high school student-athletes (Powell, 2001), and are primarily conducted in the United States using a quantitative perspective. The current study depicts a Canadian-based qualitative perspective, something that has been scantily researched. This study will encourage researchers to broaden their scope and uncover new insight with a focus on university level student-athletes. This research study has the potential to reveal insight on the current issues of returning-to-play and returning-to-learn protocols on the integrity, vulnerability, and effectiveness as it relates to student-athletes recovering from a sport-related concussion, that may be useful to those researching the impact of sport-related injuries.

Further, this study is beneficial for universities across Canada in an effort to enhance current understanding and knowledge of a concussion. This would heighten the awareness of concussion management and could potentially reveal new possible threats that may affect student-athletes capabilities in the classroom and on the playing field. Therefore, through a qualitative phenomenological approach, this study gathered the perception of varsity football athletes with a sport-related concussion to gain a deeper understanding of the factors

constraining and facilitating academic and athletic activities. Findings will be utilized to develop/implement interventions to increase academic and athletic success in this population.

Finally, this study will further enhance knowledge by increasing awareness on constraints and facilitators in academic and athletic activities for varsity football student-athletes with a sport-related concussion. The study may thus be practical for coaches, educators, student-athletes and researchers to understand, and address the potential impacts a concussion can pose on academic and athletic activities.

### **Operational Definitions of Key Terms**

The following section presents the definitions of key terms that will be used throughout the study in an effort to familiarize and enhance understanding of the topic under consideration.

**Sport-Related Concussion:** As conceptualized by McCrory et al., (2017) sport-related concussion is defined as “a traumatic brain injury induced by biomechanical forces” (p. 2). According to McCrory et al., (2017) common features used in clinically defining a concussion include: sport-related concussion may result from a direct blow from anywhere on the body from an impulsive force transmitted to the head. Sport-related concussion commonly occurs in short-lived impairment of neurological function; however, in particular situations, signs and symptoms may grow from a number of minutes to hours. Sport-related concussion has the potential to cause neuropathological changes, and “results in a range of clinical signs and symptoms that may or may not involve loss of consciousness” (p. 2).

**Facilitators:** A facilitator is defined as someone or something that helps brings about an outcome by providing direct, indirect or unobtrusive assistance, guidance, or supervision (Sallis & Owens, 2015). In the context of this study, facilitators are factors facilitating varsity football

student-athletes involvement in the classroom and on the playing field following a sport-related concussion. For example, facilitators may include but are not limited to the following: prior experiences of enjoyment in academics and athletics, perception that staying involved in academics and athletics is essential for mental and physical health, encouragement from family, friends, coaches, and teammates to engage in academics and athletics, return-to-learn and play protocols, and wanting to work hard in order to be able to return to the classroom and on the playing field.

**Constraints:** Constraint is the state of being restricted or limited to perform action, and it is a repression of one's own feelings, behaviour and actions (Sallis & Owens, 2015). In the context of this study, constraints are being examined as barriers constraining varsity football student-athletes involvement in the classroom and on the playing field following a sport-related concussion. For example, constraints may include but are not limited to the following: lack of motivation, decreased well-being, intimidated by physical activity following sport-related concussion, lack of knowledge on rehabilitation programs and benefits for individuals with sport-related concussion, lack of guidance from health professionals (i.e. athletic trainer, team doctor, and interns), lack of management from educators (i.e. professors, guidance councillors and academic advisors), feeling isolated, perceived social stigma, and time consuming.

**Intrapersonal:** Factors including characteristics of the individual such as knowledge, attitudes, behaviour, self-efficacy, and previous personal experiences (Sallis & Owen, 2015).

**Interpersonal:** Factors including formal and informal social network and social support systems such as family, work group, and friendship networks (Sallis & Owen, 2015).

**Environmental:** Factors including categories such as institutions, opportunities within communities to which individuals belong to, and accessibility to health care resources/available information (Sallis & Owen, 2015).

**Institution:** For the purpose of this study the term institution refers to the university setting, including the academic, and athletic matters.

**Student-athlete:** The term student-athlete is given to an individual who is enrolled as a full-time student, and participates in varsity athletics at their respective educational institution. According to the University of Ottawa official website (2017), all Gee-Gee varsity student-athletes must be registered full-time while participating in athletics in order to be deemed eligible.

**Varsity football student-athlete:** Full-time student-athlete who is a member of an institutions football program. Under U Sports regulations, varsity football student-athletes are eligible to compete for five years provided they meet eligibility criteria as full-time students (University of Ottawa, 2017).

**mTBI:** mild Traumatic Brain Injury (mTBI) is a concussion which displays minimal signs of central nervous system functioning (Morris et al., 2014).

**CTE:** Chronic Traumatic Encephalopathy (CTE) is a degenerative brain disease found in individuals with a past history of repetitive brain trauma that may result from multiple concussions and/or sub-concussive hits to the head (Yi et al., 2013).

**Social Identification:** Is a person's sense of who they are based on their group membership(s). Social identification adopt the identity of the group individual(s) categorize themselves as belonging to (Hatch, 2011). For example, if you categorize yourself as a student-athlete, you may

adopt the identity of categorizing yourself as a student-athlete attached with an emotional significance to your identification with a group

**Return-to-play protocol:** After a student-athlete has been diagnosed with a concussion, the return-to-play protocol outlines the steps for a player to follow in order to safely return to athletic activities following a concussion (Clover & Wall, 2010).

**Return-to-learn protocol:** After a student-athlete has been diagnosed with a concussion, the return-to-learn protocol outlines the steps for a student-athlete to follow in order to safely return to academic activities following a concussion (Master, Gioia, Leddy, & Grady, 2012).

**Academic setting:** Is defined to be a classroom, office, laboratory, library, or field experience site where instruction, advising, or service hours occurs for a given institution where educational affairs occurs.

**Athletic setting:** Is defined to be a playing field, training, weight room, film room, sporting practice and games, for a given institution where athletic affairs occurs.

## Chapter 2

**Literature Review****Academic Impacts of a Concussion**

Research has shown concussion produces a variety of symptoms such as headache, fatigue, impaired concentration, and reduced processing speed. These symptoms are associated with poor academic performance, and negatively affect the capability of a student-athlete to maximize their full academic potential (Ransom, Vaughan, Pratson, Sady, McGill, & Gioia, 2015; Wasserman, Bazarian, Mapstone, Block, & Wijngaarden, 2016). According to Ransom et al. (2015), “students may require a brief absence from school initially during a heightened symptomatic state, temporarily interfering with their ability to keep pace with the curriculum” (p. 1044). In addition, Ransom et al. (2015) suggested that absence from school could be prolonged if one engages in challenging cognitive activities. Although there have been protocols for returning-to-play, “there is no expert consensus on a protocol for return to school during concussion recovery” (Ransom et al., 2015, p. 1044). Therefore, due to a lack of standardized protocols for returning to learn, this leaves a student-athlete vulnerable to post injury academic effects. Some of the common school problems listed by high school student-athletes who sustained a concussion were, headaches interfering overall workload, problems paying attention, and feeling fatigued (Ransom et al., 2015). Thus, some of the diminished academic skills included increased time spent on homework and assignments, difficulty comprehending material, studying, and taking class notes (Ransom et al., 2015).

According to Wasserman et al. (2016), medical record reviews and surveys indicated that up to 73% of students who sustained a concussion had to adjust their academic requirements by

means of; curriculum modifications, extra time on tests, and tutoring, as a direct result of the symptoms suffered from a concussion. The majority of the literature focused on diagnosis, symptoms, and guidelines of returning-to-play following a concussion. Gaps in the literature include a lack of concentration on how a concussion may affect young adults not only academically but also athletically, and developing a guideline for returning to learn (Halstead, McAvoy, Devore, Carl, Lee, & Logan, 2013). Since most individuals look physically normal after suffering a concussion, Halstead et al. (2013) stated, “school officials often fail to recognize the need for academic or environmental adjustments” (p. 948). Therefore, it can be difficult for educators to grasp the complete extent of symptoms experienced by a student with a concussion, making it difficult for educators to justify the need for adjustments for a student with a concussion (Halstead et al., 2013). In addition, Halstead et al. (2013) noted the most significant barrier paediatricians reported is a lack of training on handling concussion management to successfully counsel patients on returning to learn following a concussion.

Even though there is no universal definition of a concussion, according to Halstead et al. (2013) there is agreement that “the goal during concussion recovery is to avoid overexerting the brain to the level of worsening or reproducing symptoms” (p. 949). In an effort to return to the classroom, Halstead et al. (2013) cited many published statements supporting the importance of cognitive rest following a concussion. Common signs and symptoms a student may encounter can range from physical, cognitive, or emotional (Halstead et al., 2013). Furthermore, Halstead et al. (2013) mentioned that it is important for educators to be aware of the signs and symptoms of a concussion, “and how they may affect the student in the school setting” (p. 950). By doing so, the educator will have a stronger sense of allocating adequate time-off in an effort to minimize the symptoms from deteriorating, and potentially enabling a quicker recovery time.

However, according to Halstead et al. (2013) since the diagnosis of concussion is primarily symptom determined, as some students may have pre-existing symptoms of depression, headache, learning disabilities, and/or other disorders, which may not be exclusive to a concussion. Halstead et al. (2013) suggested a student returning to learn after sustaining a concussion should be assigned to a team of medical staff who are responsible for making the transition back to school easier. The ultimate goal is to keep the student's symptoms at a minimum in an effort to return the student to the classroom symptom free as soon as possible (Halstead et al., 2013).

Research by Carson et al. (2004), revealed that several students who suffered a sport-related concussion “experienced a recurrence or worsening of symptoms after premature return-to-play or return-to-learn, suggesting that they have not adequately recovered” (p. 314). The issue in premature return to athletics and academics is that clear guidelines as to what cognitive rest entails needs to be established (Carson et al., 2014). In addition, Carson et al. (2014) suggested that emphasis needs to be placed on finding the best method for creating a physician approved and school coordinated plan to ensure the student-athlete receives a full and healthy recovery. In an effort to reduce the academic and athletic impacts of a concussion their needs to be more awareness and concussion based education when it comes to informing athletes, coaches, parental guardians, school administrators, teachers, and athletic directors (Pontius, 2018). For instance, Pontius (2018) suggested, “educating all on how concussions occur, what signs and symptoms to look for and how to implement safeguards when an athlete is suspected of a concussion and how to reduce the risks of concussions” (p. 4).

Neal MgGrath (2010) stated, “post-concussion symptoms often interfere with a student-athlete's ability to do academic work, participate in the classroom setting, and function

interpersonally with peers and parents” (p. 494). McGrath (2010) argued the student-athlete will recover quickly with rest “from physical exertion and athletic activity but also from the cognitive demands of academic work” (p. 494). Additionally, McGrath (2010) noted academic positive support during recovery from teachers, guidance counsellors, and school personnel, play an integral role in supporting the student-athlete with academic demands in a fashion that does not overstress the cognitive functions leading to a prolonged recovery period. For instance, a customized plan that prioritizes academic work such as, extended time on tests, and use of a note taker, while balancing rest allows the student to continue academic work as symptoms improve (McGrath, 2010).

### **Athletic Impacts of a Concussion**

According to Gessel, Fields, Collins, Dick, and Comstock (2007) sport-related concussion preventative measures relied on gathering more data on concussion rates, patterns, and risk factors. Gessel et al. (2007) examined high school and university level athletes in the United States and found that in contact sports, concussions occurred frequently during running plays. For example, of the concussions suffered by football athletes, it was noted from the Gessel et al. (2007) study that linebackers represented the highest rate of concussion on the defensive side of the ball. For those athletes, the common concussion related symptom reported was headache, dizziness, and confusion (Gessel et al., 2007).

Guskiewicz et al. (2004) noted that in 1968, there were 36 brain and cervical spine deaths in high school and collegiate athletics in the USA. Since then, the number of deaths associated with concussions have decreased due to a multitude of factors for managing sport-related concussion, such as, rule changes, player education, equipment standards, alternative assessment techniques, reducing physical contact in practice, awareness of returning to play protocol, and

finally, the athlete's own awareness of the risks linked with concussion (Guskiewicz et al., 2004). Despite these factors to manage sport-related concussions, minimal evidence-based research is offered on how long it takes for an athlete to recover following a concussion, and when it is deemed safe to return to play (McCrea et al., 2003). For instance, in a study conducted by McClincy, Lovell, Pardini, Collins, and Spore (2006), one of the biggest issues in sport-related concussion is the need to establish scientific protocols for returning-to-play following a concussion. The biggest challenge for physicians, and athletic trainers is knowing when the athlete is ready to safely return to play; however, many coaches, athletic trainers, and team physicians may be unaware of the severe concerns that can arise if an athlete is prematurely cleared to return to play (McClincy et al., 2006).

Since concussion is heavily based on subjective symptoms told by the athlete it becomes difficult for team physicians and athletic trainers to determine the severity of their symptoms due to a lack of awareness and education about concussion, the will of athletes to keep playing, and concerns about the coach's reactions (Asken et al., 2018). In addition, Asken et al., (2018) noted as many as 50% of athletes fall short in sharing their injuries or are delayed in being removed from athletic participation. Furthermore, student-athletes who are immediately removed from athletic participation following a sport-related concussion had less time lost compared to athletes who did not (Asken et al., 2018). For instance, Asken et al. (2018) found that athletes who immediately removed themselves from sport participation after suffering a concussion took five fewer days to return to play compared to those athletes who delayed the process of removing themselves immediately. The immediate removal of an athlete who sustained a sport-related concussion is critical in an effort to reduce the risk in preventing additional trauma and catastrophic outcomes (Elbin, D'Amico, McLeod, Covassin, & Anderson, 2017). Ultimately, for

sport-related concussion to have minimal athletic impacts, immediate removal from sport participation is necessary to expedite recovery time (Asken et al., 2018).

Furthermore, sport-related concussions have severe impacts on mental health conditions (Sarac, Pedroza, & Borchers, 2017). Sport-related concussion have been linked to depressive and anxious symptoms in athletes following a concussion (Sarac et al., 2017). Sport-related concussion has the potential to affect a varsity athlete not only physically but psychologically as well (Hong, Keenan, Putukian, & Scifers, 2018). Hong et al. (2018) noted a variety of mental illnesses collegiate athletes could go through following a sport-related concussion, such as stress, anxiety, depression, withdrawal, disordered eating, and substance abuse. Concussions can disrupt brain function, affecting an athlete's immediate physical, cognitive, emotional, and sleep health, and has the potential to lead to long-term severe conditions, which can pose a risk for future athletic potential (Yang, Asa, Noble, Torner, Schmidt, & Cooper, 2018).

### **Sport-Related Injury Constraints**

Injuries, according to Margot Putukian (2016) pose a major constraint that could potentially lead to significant challenges. Performing and succeeding academically and athletically becomes more challenging and difficult if an athlete is injured (Putukian, 2016). Stress poses a major constraint in the response to, rehabilitation and return to learning and playing after injury (Putukian, 2016). In addition, there are constraints to mental health treatment in student-athletes following an injury (Putukian, 2016). For instance, Putukian (2016) mentioned how student-athletes see requesting help as a sign of weakness because they should be able to overcome psychological issues as they do physical issues.

Pre-injury constraints include biological, physical, psychological, and sociocultural that could increase a student-athlete's risk of injury and poor recovery (Putukian, 2016). Stress, according to Putukian (2016) could cause attention changes, distraction and heightened self-consciousness that could hinder a student-athlete's overall performance and predispose a student-athlete to injury. Putukian (2016) noted that stress played a major role as a constraint for student-athletes, which led to, increased muscle tension and coordination that increased the risk for injury.

In a study conducted by Brewer and Petrie (1995) physical injury caused 33% of Division 1 football players in the United States as having high levels of depressive symptoms, compared with 27% of non-injured student-athletes. Intrapersonal constraints, such as depression, and stress increase the risk of injury, and impact academic and athletic performance for a student-athlete (Brewer & Petrie, 1995). For instance, when an athlete is injured, common emotional responses are the following: sadness, isolation, irritation, lack of motivation, anger, frustration, changes in appetite, sleep disturbance, and disengagement (Brewer & Petrie, 1995). However, student-athletes differ in their response to injury (Putukian, 2016).

Concussion can pose a major challenge for student-athletes to recover physically and emotionally, and is usually associated with significant time loss or retirement from sport (Gardner, 2013). Putukian (2016) mentioned how not being able to exercise following initial diagnoses of a concussion, and given emotional and cognitive symptoms associated with concussion, student-athletes may struggle with academics as well as the emotional response from a concussion. As well, with the recent rise in literature of CTE, student-athletes are concerned that they may develop CTE following a concussion (McCrory et al., 2013)

According to Gulliver, Griffiths and Christensen (2012) student-athletes are less likely to seek out assistance for mental health issues than non-athletes. Student-athletes may be more susceptible to be at a higher risk for mental health issues because they are less likely to seek services that provide assistance due in large part to potentially being afraid to disclose symptoms, seeking counselling as a sign of weakness, sense of entitlement, and/or may not have developed healthy coping mechanisms to deal with failure (Gulliver, Griffiths, & Christensen, 2012). Gulliver et al. (2012) also noted that many athletes may not have developed a sense of identity outside of that as an athlete, and as a result if their role as an athlete is threatened by injury, they may be more susceptible to a loss of identity, which could lead to a heightened risk in mental health issues. Furthermore, stigma surrounding mental health services for a student-athlete remains one of the biggest constraints to seeking help following an injury (Gulliver et al., 2012). For example, in a study conducted by Gulliver et al. (2012) of elite athletes aged 16-23, focus group discussions revealed that stigma was the dominant perceived constraint for student-athletes requesting assistance. Other constraints to help seeking for student-athletes following an injury included: lack of problem awareness, difficulty in expressing emotion, lack of time, denial of problem, not sure who to ask for help, fear of what might happen, worried about affecting ability to play/train, and belief that seeking assistance would not help (Gulliver et al., 2012).

### **Sport-Related Injury Facilitators**

Hamson, Martin, and Walters (2008) noted that athletic trainers, team physicians, and any other pertinent healthcare provider play a major role in recognizing the common signs and symptoms for various mental health issues and understand the resources available for treatment and management following an injury for student-athletes. According to Gulliver et al. (2012) education and awareness of mental health services, accessibility, confidentiality, encouragement

from others, having an established relationship with a healthcare provider, a positive previous interaction with healthcare providers, internet access and the positive attitude of others, especially coaches and teammate, all facilitated help seeking following an injury. Social support from coaches, teammates, athletic trainers and team physicians served as a critical role in facilitating the student-athlete to feel involved and part of the team for injured student-athletes (Hamson et al., 2008). In addition, having programs readily available to educate student-athletes, as well as, athletic administrative staffs regarding the resources available served as a facilitator in academic and athletic settings in providing effective care (Hamson et al., 2008).

Interestingly, a study conducted by Mensch and Mitchell (2008) discussed how a student-athlete sustaining a significant injury served as a facilitating role in continuing athletic training by high school student-athletes. For instance, Mensch and Mitchell (2008) noted twelve students were interested in furthering athletic training because of an injury they received during high school athletics. For example, one participant in Mensch and Mitchell's (2008) study mentioned, "I got interested in athletic training because I've had a lot of injuries while playing football. I had an ACL [anterior cruciate ligament] tear and toe fracture. I have had sprains and bumps and bruises" (p. 73). Furthermore, other factors facilitating students towards pursuing athletics following an injury included, supportive advice from an academic guidance counsellor, parents, and athletic trainers, and education awareness pertaining to mental health issues that could arise following an injury (Mensch & Mitchell, 2008).

### **Return to Play**

According to Kissick and Johnston (2005), concussion management should be handled by following the four Rs, which is: recognition, response, rehabilitation, and return. Pressure often arises from coaches, parents, teammates and the player to return to play following a concussion

(Kissick & Johnston, 2005). Kissick and Johnston (2005) noted that the pathophysiological changes to the brain following a concussion are not yet scientifically understood. For example, in the recognition phase, it was mentioned that the most challenging part of managing sport-related concussion is the recognition of injury due to the fact that not all signs and symptoms are obvious in relation that a concussion has been sustained (Kissick & Johnston, 2005). In the response phase, any athlete who is alleged of having a concussion should be removed immediately from play (Kissick & Johnston, 2005). Kissick and Johnston (2005) noted, “That a return to play while still symptomatic greatly increases the risk of more severe post concussive symptoms and a more prolonged post-concussive course” (p. 427). Following the response phase, the athlete will enter the rehabilitation phase where the physician will treat the athlete (Kissick & Johnston, 2005). Once the physician clears the athlete, they may proceed to a return to play protocol, where, once cleared they will be able to return to sport participation (Kissick & Johnston, 2005).

Neurodegenerative diseases, such as chronic traumatic encephalopathy (CTE), make return to play protocols vital for athletes to recover safely; otherwise, premature return to play poses a significant repetitive concussion health risk for the athlete (Satarasinghe et al., 2019). Furthermore, Satarasinghe et al. (2019) noted that all the major sports leagues, concussion RTP protocols, regardless of the number of specific steps and unique intricacies, include three common stages: (1) rest, (2) re-exertion, and (3) return to play.

Below is a table derived from Satarasinghe et al. (2019) study summarizing concussion return to play protocols from major league professional sports, and collegiate athletics:

*Table 1 Concussion return to play from major league professional sports, and collegiate athletics.*

Sport, League (Level)	Source of Information	Major Points from RTP Concussion Protocol
Football, NFL (professional)	NFL Head, Neck, and Spine Committee	(1) Players rest until signs and symptoms disappear. (2) Players then undergo light aerobic exercise under oversight of medical staff. (3) Players start strength activities and cardiovascular activities. (4) Players start non-contact football activities like throwing and catching. (5) Players can resume football activities and full contact after clearance by team physician and examination by independent neurological consultant.
Hockey, NHL (professional)	NHL Concussion Education Program	(1) Player cannot return to practice or game on the same day event occurred, irrespective of symptom resolution. (2) Player may return to unrestricted play when there is complete recovery of concussion symptoms at competitive exertion levels, and player has been judged by club physician and consulting neuropsychologist. (3) There is no mandatory period of withdrawal time following concussion. (4) Club physician is solely responsible for making RTP decisions based on the above parameters.
Soccer, MLS (professional)	US Soccer National Team Concussion Evaluation and Management Program	(1) Rest until asymptomatic. (2) Light aerobic exercise. (3) Moderate aerobic exercise. (4) Sport-specific training. (5) Non-contact, full exertion drills. (6) Begin contact heading training. (7) Full contact training. (8) Return to competition when

instructed by team physician.

Basketball, NBA (professional)	NBA concussion protocol program	(1) No evidence of concussion symptoms at rest. (2) Evaluation by physician. (3) Successful completion of NBA exertion protocol. (4) Team physician and director of NBA concussion program agreement to return player to play.
		(1) All symptoms at rest and with exertion cleared, including baseball activities. (2) ImPACT (immediate post-concussion assessment and cognitive testing), results have returned to baseline. (3) Club physician feels it is safe for player to return to competition.
Baseball, MLB (professional)	MLB Players Association concussion policy	(1) Light aerobic exercise, no resistance training until asymptomatic. (2) Sport-specific activities with no head impact, until asymptomatic. (3) Non-contact sports drills with resistance training until asymptomatic. (4) Unrestricted training until asymptomatic. (5) Clearance by team physician for return to competition.
	NCAA Sport Science Institute	(1) Light aerobic exercise, no resistance training until asymptomatic. (2) Sport-specific activities with no head impact

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All sports, NCAA  
(collegiate)

until asymptomatic. (3) Non-  
contact sports drills with  
resistance training until  
asymptomatic. (4) Unrestricted  
training until asymptomatic. (5)  
Clearance by team physician for  
return to competition.

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*\*RTP, return to play; NFL, National Football League; NHL, National Hockey League; MLS, Major League Soccer; NBA, National Basketball Association; MLB, Major League Baseball; NCAA, National Collegiate Athletic Association*

Furthermore, Satarasinghe et al. (2019) mentioned that without a stronger understanding of sport-related concussion, the over diagnosis and under diagnosis can be harmful to athletes; for instance, “over diagnosis of concussion can cause athletes to unnecessarily miss games, lose training time, and even suffer reduction in pay. On the other hand, under diagnosis of concussion becomes a public health concern with concussed and sub-concussed athletes continuing to play which may lead to neurodegenerative processes later in life” (p. 6).

In Canada, the Ontario University Athletics (OUA) tends to take a similar approach to concussion management as the NCAA (Ontario University Athletics [OUA], 2019). The OUA (2019) defined a concussion based on 42 consensus definitions such as, a concussion is a change in brain function, following a force to the head, which may be accompanied by temporary loss of consciousness, but is identified in awake individuals, with measures of neurologic and cognitive dysfunction. According to the OUA Concussion Policy (2019), it mandates that institutions implement the following: (1) An annual process that ensures student-athletes are educated about the signs and symptoms of concussion; (2) A process that ensures a student-athlete who exhibits signs, symptoms or behaviours consistent with a concussion shall be removed from athletic activities and evaluated by a physician or the physician’s designee; (3) A policy that precludes a student-athlete diagnosed with a concussion from returning to athletic activity for at least the

remainder of that calendar day; and, (4) A policy that requires medical clearance for a student-athlete diagnosed with a concussion to return to athletics activity as determined by a physician or the physician's designee. The OUA (2019) official website stated, "Institutions should make their concussion management plan publically available, either through printed material, their website, or both" (p.10); however, the University of Ottawa does not have their concussion management plan publically available through their website.

Furthermore, the OUA (2019) stepwise concussion management protocol is as follows once a concussed student-athlete has returned to baseline level of symptoms: (1) Light aerobic exercise such as walking, swimming or riding a stationary bike. No resistance training. If asymptomatic with light aerobic exercise, then; (2) Mode, duration and intensity dependent exercise based upon sport. If asymptomatic with such exertion, then; (3) Sport-specific activity with no head impact. If asymptomatic with sport-specific activity, then; (4) Non-contact sport drills and resumption of progressive resistance training. If asymptomatic with non-contact drills and resistance training, then; (5) Full-contact practice. If asymptomatic with full-contact practice, then; (6) Return-to-play. The team physician/physician designee, or athletic therapist in consultation with a team physician will determine medical clearance. It is important to note that twenty-four hours should pass before moving onto the next step (OUA, 2019).

According to Wallace, Covassin, and Lafavor (2017), the decision for an athlete to return to play following a concussion is one of the most challenging decisions facing sports medicine professionals. For instance, according to the OUA (2019), "the physical and cognitive examinations are often normal, and additional tests such as brain computerized tomography (CT), brain MRI, electroencephalogram and blood tests are also commonly normal" (p. 8). The history of concussion based research remains poorly defined, diagnosis is thus difficult, and there

are often only a few objective findings for medical professionals to diagnose, compared to a significant amount of self-reliance reports from the student-athlete (OUA, 2019). Furthermore, the goal for sports medicine professionals who treat concussion is to have the athlete return to play as soon as possible without putting the athlete at risk for sustaining further injury (Wallace et al., 2018). Although there are a plethora of return to play protocols, Wallace et al. (2018), noted cognitive and physical rest as essential treatments of concussion until the athlete's symptoms have concluded. Additionally, regardless of all the research and information on returning to play, the returning to play decision continues to be controversial and a difficult task for athletic trainers since the literature is unclear and at times inconsistent in relation to specific management of concussion and return to play (Wallace et al., 2018). Furthermore, the most sought out return to play protocol that is widely recognized and consensus-based guidelines agree that a gradual stepwise progression in physical activity should be introduced before an athlete is ready to return to play (Wallace et al., 2018).

In a study conducted by Kroshus, Baugh, Daneshvar, Stamm, Laursen, and Austin (2015), sports medicine professionals "had experienced pressure from coaches and athletes to return to athletes to participation prematurely after a concussion" (p. 944).

According to Lovell, Collins, and Bradley (2004), the return to play decision is typically based on limited observation of the athlete and a brief sideline evaluation. Following a sport-related concussion, Lovell et al. (2004) indicated that the athlete might be unaware that they have suffered a concussion by not showing any apparent signs of a concussion to the athletic trainer, such as, headache, amnesia, confusion and/or dizziness, etc. Therefore, this complicates the situation for when it is safe for the athlete to return to play and thus makes the athlete susceptible to sustain a risk of greater injury. Furthermore, the most common on-field symptom of a sport-

related concussion is a headache; however, it is important to note that although headache is the most common symptom of a concussion, a concussion has the potential to occur without a headache (Lovell, Collins, & Bradley, 2004).

The issue with concussion guidelines is the fact that the majority of guidelines for returning to play criteria are identical for athletes regardless of age (Lovell et al., 2004). Additionally to age, the returning to play decision should factor the concussion history of an athlete as multiple concussions can cause cumulative detrimental effects (Lovell et al., 2004). Lovell et al. (2004) noted, “Presently there are several computer-based management approaches under development to help provide the sports medicine clinician with neurocognitive data to better determine return to play and other management issues following concussive injury” (p. 434). They outlined four computer-based models, such as ImPACT (Immediate Post-Concussion Assessment and Cognitive Testing), CogState, Headminders, and ANAM (Automated Neuropsychological Assessment Metric). These models are continuing to gain interest within the field of sports medicine; for example, the Lovell et al. (2004) mentioned “such an approach to injury is systematic and individually tailored, rather than applying general standards (e.g., grading systems) to concussion management that lack empirical validation” (p. 435).

### **Return to Learn**

There is limited research and guidelines addressing the academic perspective of a student-athlete suffering a concussion. Interestingly, numerous studies have been focused on the athletic side of an athlete; while very few research and guidelines have addressed the returning to learn protocols and guidelines (Halstead et al., 2013).

The return to learn protocol is a similar concept to return to play; however, return to learn has minimal scientific evaluation (OUA, 2019). Based on expert consensus, OUA (2019) outlined their return to learn protocol as the following stepwise program: The first step is physical and cognitive rest. This encompasses limiting potential stressors, such as homework, screen time, and reading (OUA, 2019). The second step is if the student-athlete cannot tolerate light cognitive activity, he or she should remain at home, and then; once the student-athlete can tolerate light cognitive activity without return of symptoms, he or she should return to the classroom (OUA, 2019). It was mentioned that the academic accommodations needed by the student-athlete should be decided and comprised of a team with team physician, athletic therapist, faculty representative, individual teachers, neuropsychologist and psychologist (OUA, 2019).

In a study conducted by Baker et al. (2014), “research on the academic effects of concussion has generally shown no adverse long-term outcomes. However, problems can persist for weeks or months, causing significant academic disruption” (p. 1286). Additionally, Baker et al. (2014) noted a developing consensus on the ideal process for return to learn; however, a there is still a lack of research.

### **Theoretical Framework**

The study is framed by the social ecological model (Sallis & Owens, 2015) and focuses on a comprehensive approach to understanding determinants of health. As such, the social ecological model is a suitable framework for understanding and conceptualizing constraining and facilitating intrapersonal, interpersonal, and environmental factors that influence (Sallis & Owens, 2015) the academic and athletic settings in varsity football student-athletes with a sport-related concussion. The multiple levels of factors that are responsible for influencing an individual's behaviour are most commonly categorized into intrapersonal, interpersonal, and environmental factors (McLeroy et al., 1988; Sallis & Owens, 2015). Historically, these factors are ranked hierarchically in that intrapersonal factors along with interactions that immediately surround the individual will serve a greater influence on the individual's behaviour while environmental factors are typically known to have less influence on the individual (McLeroy et al., 1998; Sallis & Owens, 2015). Interpersonal factors are generally categorized as social networks and social support systems that include family, friendships, and norms (McLeroy et al., 1998; Sallis & Owens, 2015). Yet, the application of the social ecological model to better understand factors influencing academic and athletic behaviour for this population remains sparse. The social ecological model is a framework used in understanding the interrelations among diverse personal and environmental factors in human health and illness (Stokols, 1996).

The main distinguishing features of the social ecological model of health are focused around behavioural change and lifestyle modification, environmental enhancement and restructuring, and social ecological analyses of health promotion (Stokols, 1996). Furthermore, Stokols (1996) mentioned that the social ecological model incorporates "person-focused efforts

to modify persons' health behaviour with environment-focused interventions to enhance their physical and social surroundings" (p. 283).

According to Sallis, and Owens (2015) there has been increasing use in the social ecological model in research and practice, due in large part to the model providing a guiding comprehensive population wide approach to modifying behaviours that will reduce serious and prevalent health problems. The term ecology derives from biological science and refers to the interrelations between organisms and their environment (Sallis & Owen, 2015). Furthermore, Sallis, and Owen (2015) mentioned, as the model evolved, the social ecological model developed into focusing on the nature of people's transactions with their physical and sociocultural surroundings, that is, environment. Furthermore, according to the Ottawa Charter for Health Promotion (1986), healthy behaviours are maximized when environments and policies support and advocate for healthy choices, and individuals are motivated and educated to make those choices. Thus, the social ecological model takes the combination of both individual-level and environmental/policy-level interventions to attain substantial changes in health behaviours (Sallis & Owen, 2015).

Social ecological models of health have been fundamental to health promotion for several decades (Sallis & Owen, 2015). One of the key strengths of the social ecological model is that it places emphasis on multiple levels of influence that widens options for interventions (Sallis & Owen, 2015). However, the social ecological model has been criticized for its lack of specificity about the most important hypothesized influences (Sallis & Owen, 2015). Thus, according to Sallis, and Owen (2015) this places a greater problem on health promotion professionals to identify critical factors for each behavioural application.

The main categories of factors that make up the social ecological model are intrapersonal, interpersonal, and environmental factors (Sallis & Owens, 2015). Intrapersonal factors consist of individual characteristics such as knowledge, attitudes, behaviour, beliefs, abilities, self-efficacy, and previous life experiences (Sallis & Owens, 2015). Interpersonal factors have to do with social networks and social support systems such as family, friendships, and norms (Sallis & Owens, 2015). Lastly, environmental factors focuses on institutions, opportunities within communities, policies and protocols, convenience and accessibility to places, healthcare resources and available information (Sallis & Owens, 2015). Applying the social ecological model to identify such factors can enable coaches, parents, educators, and health professionals to develop and implement effective factor-specific modifications and/or interventions that eliminate constraining factors while bolstering facilitating factors (Weinstein, Rothman, & Sutton, 1998).

## Chapter 3

**Methodological Approach**

The most appropriate epistemology for the current research study appeared to be constructionism. According to Crotty (1998) meanings from a constructionism viewpoint “are constructed by human beings as they engage with the world they are interpreting” (p. 43). Based on this selected epistemology, an appropriate methodology was carefully chosen. A methodology is a comprehensive strategy that outlines choice and use of methods relating to the outcome (Crotty, 1998). A phenomenological research design is thus utilized to gain a better understanding on the topic as perceived by participants (Leedy & Ormrod, 2013).

Phenomenology, according to Leedy and Ormrod (2013) refers to “a person’s perception of the meaning of an event, as opposed to the event as it exists external to the person” (p. 139). For the purpose of this research, the phenomenon of study is the constraints and facilitators in the academic and athletic settings for varsity football student-athletes with a sport-related concussion through the perception of varsity football student-athletes. Phenomenological studies attempt to understand people’s perceptions, perspectives and understandings of a situation (Leedy & Ormrod, 2013).

Phenomenology as the study’s selected methodology is useful for gathering information on the perceptions of varsity football participants. Phenomenological research is generally supported by in-depth interviews and has sample sizes ranging from five to twenty five participants who have had direct perceptions with the phenomenon of study (Leedy & Ormrod, 2013). According to Leedy and Ormrod (2013) interviews in this type of research generally involve the participant doing most of the talking in relation to the phenomenon while the researcher does most of the listening. Ultimately, the qualitative phenomenological approach is

appropriate for this study to reveal revelations in our understanding of the constraints and facilitators in the academic and athletic settings for varsity football student athletes with a sport-related concussion.

### **Population Group and Sample Size**

For the purpose of this research, a purposeful and convenience sampling technique was employed to access varsity football student-athletes who have sustained a sport-related concussion. Purposeful sampling technique is justified because it involves recruiting knowledgeable individuals who perceived the phenomenon under investigation (Creswell & Plato Clark, 2011). Convenience sampling technique is justified since the target population in this study meets practical criteria, such as accessibility, and geographical proximity (Etikan, 2016). Therefore, since the ultimate goal of this study is focused on the perceptions of a particular population in relation to identifying constraints and facilitators in the academic and athletic settings for varsity football student-athletes with a sport-related concussion, a purposeful and convenience sampling technique enabled the researcher to elicit valuable information to address the study's research questions.

Purposeful sampling is not a probability sample that will lead to the development of statistical inferences to a population, rather, it involves making a deliberate choice of specific individuals and sites that can provide necessary information to answer the research questions that cannot be obtained using other sampling choices (Maxwell, 2013). Generally, qualitative research is a time-consuming endeavour that involves collecting and analyzing large amounts of information from each individual respondent; it is common for qualitative studies to contain a relatively small sample of participants (Leedy & Ormrod, 2013). Small sample sizes preserve the individuality of participants during analyses, instead of collecting a large amount of data from

greater samples and generalizing the data for all participants (Creswell, 2007). The sampling process in qualitative research consists of utilizing a strategy to purposefully select individuals from specific sites (Creswell, 2007).

According to Etikan et al. (2016), “convenience sampling is affordable, easy and the subjects are readily available” (p. 2). Thus, participants in this study met the practical criterion for convenience sampling.

The University of Ottawa is North America’s largest bilingual university, located in Canada’s capital, less than 2 kilometres from Parliament Hill. It is a very diverse university, which offers over 300 undergraduate programs and includes student and faculty from about 150 countries (University of Ottawa, 2017). The University of Ottawa’s football program competes in the Ontario University Athletics (OUA) conference in U Sports. The football program began in 1881 as one of the first established football programs in Canada (University of Ottawa, 2017). During the 2018-2019 football season, there were 104 varsity student-athletes listed on the University of Ottawa football team roster (University of Ottawa, 2017). The University of Ottawa is host to sixteen U Sports varsity teams.

Participants were recruited from the University of Ottawa football program where the researcher has been a previous member, and is well acquainted and familiar with the coaching staff, players, and football culture. Recruitment was conducted through a recruitment letter posted around the football training facility, social media, and Email. Recruitment efforts included an accurate description of the purpose of the study, name and contact information of the researcher, eligibility criteria, time commitments required, and location of the research. Additionally, recruitment efforts stated that the participants would remain anonymous.

For this study, twelve participants took part in single semi-structured interviews. Initially, sixteen participants had agreed to participate; however, due to various reasons four participants dropped out. Participants consisted of twelve males between 19 and 23 years of age. Participants were selected to participate on a first come first serve basis. Participants also met the criteria outlined by Rubin and Rubin (2015) by being knowledgeable about the area being investigated, willing to discuss it, and represented their perspectives and points of view.

This study had specific inclusion criteria. To be eligible to participate in this study, (1) participants had to speak English, (2) be on the official roster of the University of Ottawa varsity football team, (3) registered as full-time students, (4) diagnosed with a sport-related concussion by a medical professional, (5) and compete in U Sports at the time of the study (University of Ottawa, 2017).

## **Method**

A method, according to Crotty (1998) is the technique used to collect and analyze data related to a research question or hypothesis. An interview is a conversation held by the researcher to the participant where questions are asked, and answers are given (Atkinson, 2001). Atkinson (2001) continued to say an interview refers to a conversation with an individual acting as the interviewer and the interviewee. The researcher employed semi-structured interviews as the main method for data collection. Semi-structured interviews are advantageous because they are flexible, which leads respondents towards answering questions as they see fit, and it offers rich qualitative information about respondents' attitudes, beliefs, values and opinions (Atkinson, 2001).

Prior to data collection, the researcher obtained ethical approval through the Research Ethics Board (REB) at the University of Ottawa (Appendix B). Data was collected through semi-

structured interviews, which allowed participants to share personal narratives on their perception of suffering and recovering from a sport-related concussion.

### **Construction of Survey Instrument**

During the audio recorded interviews, participants were given the opportunity to reflect on their academic and athletic experiences in the context of a sport-related concussion through open-ended questions. In an effort to ensure the questions are pertinent to the purpose of the study, an interview guide has been designed (Appendix A) to identify the constraints and facilitators in academic and athletic settings for varsity football student-athletes with a sport-related concussion.

A semi-structured interview guide was developed for this study. The interview guide consisted of the following sections: (1) demographic questions, (2) past and present sport experiences, (3) past and present sport injuries, (4) facilitators to academic and athletic settings following a sport-related concussion for university football student-athletes, and (5) constraints to academic and athletic settings following a sport-related concussion for university football student-athletes. Three types of questions were asked during the interviews, such as, main questions; follow-up questions, and probe questions. Main questions served with building a framework on certain topics and link them with others. Follow-up questions were used to get in-depth descriptions on emerging themes during the interview. Lastly, probe questions helped elicit more detailed descriptions by describing specific examples, encourage interviewees to finish a train of thought, and demonstrate to the interviewee that the researcher is paying attention (Rubin & Rubin, 2005). For instance, probing questions (e.g., Could you elaborate on that point? Can you give an example?) were used to encourage participants to provide more information and refine their statements. Interview questions included the following; can you describe the

academic and athletic challenges you faced following a sport-related concussion? How did you overcome these challenges?

The interview guide was created by the researcher and was based from existing interview guides on university level student-athletes (see, Rothschild-Checroune, Gravelle, Dawson, & Karlis, 2012). The creation of the interview guide included, a draft by the researcher with demographic, academic and athletic questions, and then the researcher pilot tested the interview guide in an effort to refine and improve questions. Pilot interviews were conducted with five self-selected former football players who have had concussions, to ensure the interview guide is relevant and pertinent to address the study's research objectives. Pilot participants met the eligibility criteria for the exception of being a current full-time student-athlete at the University of Ottawa. During the pilot interviews, questions were continuously added and removed to assure the validity and reliability of the interview guide, and to ensure the collection of quality information for the twelve interviews of this study. Following the pilot interviews, the researcher gathered feedback from the five participants, and the interview guide was modified and revised accordingly to improve the quality of the collected data. This approach allowed the researcher to explore different themes and adapt the interview guide to focus on specific themes over others.

Additional steps were also taken in an effort to ensure the proper flow of the interview itself. For instance, according to Rubin and Rubin (2005), there are seven stages to develop a good interview. These stages were utilized during the twelve interviews for this study. The first stage is to create a natural environment where the interviewer starts off by expressing an interest in the participant's life and discusses general daily topics to gain trust with the participant. The second stage consisted of encouraging conversational competence, in which questions can be understandable and easily answered by the participant. The third stage is showing understanding

where the interviewer may ask follow-up questions and demonstrate empathy towards the participants. The fourth stage consists of obtaining facts and basic descriptions where the interviewer let the participants discuss a topic at large. The fifth stage is asking difficult questions where the interviewee will ask questions that may be more difficult for the participant to answer; however, these questions are only asked if applicable and the researcher must withdraw from asking these questions if discomfort is overwhelming. The sixth stage is toning down the emotional level where the participant has the chance to ask the researcher any questions. Lastly, the seventh stage is closing while maintaining contact where casual conversation is resumed and the researcher may ask participants to provide final information indirectly (Rubin & Rubin, 2005).

The researcher contacted interested participants using the email address they had provided through the recruitment letter. Before conducting the interview, each participant was informed of his right to withdrawal, confidentiality, and anonymity. Written consent was obtained before undertaking the interviews.

Once interviews were scheduled, the researcher conducted all twelve interviews in a graduate office located at the University of Ottawa in Montpetit Hall. The interview location was selected based on the participants' availability and proximity. Upon meeting at the interview location, participants were presented with the study's consent form (Appendix D) to read over and clarify the purpose, participation, benefits, confidentiality and anonymity, conservation of data, and voluntary participation of the study. Participants then signed the consent form, followed by the researcher asking if the participant had any questions about the interview process. Afterwards, the researcher reminded the participants that all information collected would remain anonymous and they had the right to withdraw from the study at any point and all

their information would be securely destroyed. Once the participant was satisfied, the interview began.

Following the completion of the interviews, the researcher explained that the participants would be given numbers in an effort to preserve anonymity, and so they could identify themselves during the member checking process. In addition, participants were also asked to provide a password of their choice, since transcripts would be sent to them by their given emailing address in a password encrypted document for them to unlock and review its accuracy. Once participants reviewed and were satisfied with their transcripts, the researcher began analyzing the transcripts. Interviews lasted between thirty and fifty minutes of duration.

### **Data Analysis**

In an attempt to ensure credibility of the study, steps for recognizing researcher bias applicable for the purpose of phenomenological research were made. For example, a bracketing exercise was implemented for the researcher to be aware of their own experiences; biases and assumptions of the given phenomenon in order to let the experience of the interpretations of participant's narratives speak to us. For instance, a bracketing interview was relevant because the researcher is a current member of the University of Ottawa men's rugby team and has suffered a sport-related concussion.

Interviews were transcribed verbatim and were examined using the thematic analysis steps suggested by Braun, Clarke, and Weate (2016). Every transcript encompassed different layers of interpretation constructed by the researcher. For this study, analysis was guided by the descriptions of the three main types of factors within the social ecological model (i.e. intrapersonal, interpersonal, and environmental). Thematic analysis steps, as outlined by Braun,

Clarke, and Weate (2016), include six steps: (1) familiarization, (2) coding, (3) theme development, (4) theme refinement, (5) theme defining and naming, and (6) writing the report. Thematic analysis, according to Braun Clarke, and Weate (2016) is a method for identifying, analyzing, and finding patterns within the data set. Thematic analysis offers a specific set of techniques to collect and analyze textual description that are not bound to any theoretical framework making thematic analysis a flexible method in which it can be combined with phenomenology to create meaning and examine factors that underlie a phenomenon under investigation (Braun, Clarke, & Weate, 2016). Thus, the researcher underwent a thorough transcribing process in an effort to familiarize the researcher with the data. In addition, the researcher emphasized key sections of the transcripts by highlighting and underlining what he deemed to be significant to the study's topic. As well, descriptive comments were documented for additional reference associated with the key sections in an effort to produce ideas for new relevant themes. Subsequently, key sections were paired with other relevant sections and organized into groups of similar quotes deriving of related ideas and concepts. During the process of creating subthemes, overarching labels were grouped and then identified with broader groups to form overarching themes. Next, final themes were originated to provide a deep understanding of the topic being studied. Throughout the entire process, analysis occurred concurrently during the data collection process to notify how data collection would progress and to decide when a sufficient amount of data was gathered to address the purpose of the research.

## Chapter 4

### Results

This chapter presents the results of this study from the data that was gathered through semi-structured interviews. The 12 participants interviewed discussed their thoughts, feelings, and overall perception of their individual sport-related concussion. Following data collection, three major themes surfaced that addressed the objectives of this study. Through Braun, Clarke, and Weate (2016) steps for thematic analysis, three main categories were identified with each containing their own set of sub-groups, of themes. The first category is intrapersonal constraining and facilitating factors. This category of themes explains the participants' intrapersonal constraining difficulties and facilitating factors encountered following a sport-related concussion. Identifying eight sub-themes created this category: (1) loss of motivation, (2) loss of social identification, (3) stress, depression, and anxiety, (4) internal pressure to return, (5) injury-specific issues, (6) prior experiences of enjoyment in academic and athletic activities, (7) seeing improvements in the recovery process, and (8) not giving up. The second category of themes discusses the participants' interpersonal constraining and facilitating factors encountered following a sport-related concussion. Identifying six sub-themes created this category: (1) insufficient social support, (2) lack of awareness and guidance, (3) external pressure to return, (4) lack of academic support post-concussion (5) passionate physiotherapy and massage therapy staff, and (6) sport psychologist. Whereas, the third category of themes describes the participants' environmental constraining and facilitating factors encountered following a sport-related concussion. Identifying two sub-themes created this category: 1) return-to-play and return-to-learn protocols, and 2) online access to resources for concussion management. For each of the themes, descriptions and quotations were provided to highlight the context. As the

researcher was a former member of the University of Ottawa football program, and a current member of the University of Ottawa rugby program, and previously suffered a sport-related concussion, it was imperative that he did not enter these interviews with a preconceived assumption of what the student-athletes perceptions consists of.

*Table 2 Year of sport-related concussion and number of participants affected*

Year of Sport-Related Concussion	Number of participants affected
2016	4
2017	5
2018	3
<b>Total:</b>	<b>12</b>

*\*The data in Table 2 outlines the year of sport-related concussion and number of participants affected in this study.*

**Intrapersonal Factors – Constraints**

***Loss of Motivation***

In a competitive sporting environment, especially a contact sport such as football, injuries are likely to occur. As a football player, despite countless strength and conditioning training, and innovative equipment improvements, head injuries are common occurrences. As identified by participants in this study, keeping, maintaining and finding motivation in the classroom and on the playing field following a sport-related concussion is something student-athletes struggled with. All participants in this study explained how they felt a loss of motivation following a sport-related concussion in their academic and/or athletic settings.

One participant explained how a lack of motivation in the academic and athletic settings was evident after suffering a sport-related concussion. For example, “It’s tough when you’re so use to a regular routine of working out and studying almost every day of the week, to sitting in a dark room doing absolutely nothing but resting. At times I questioned if I ever wanted to play football again but realized that playing football made studying and attending class easier because I knew there was something to look forward to, whether that be going to practice or working out with my teammates”. In addition, another participant mentioned how he felt a loss of motivation following a sport-related concussion because “a concussion is a lot different than a lot of injuries. You’re advised to stay away from any athletic or academic things in order to rest and heal as quickly as possible. So I did that, and when I did it was de-motivating because I felt I was no longer involved within the team. I wasn’t able to attend practice, film review, meetings, or gym sessions.” Furthermore, it was discussed how being removed from the playing field made him lose a feeling of social acceptance within the team. He recalled, “Not being able to attend social events with the team made me feel like an outsider. I didn’t want to go back and have my coaches and teammates feel bad for my injury”.

All the participants mentioned how their lives centered on training, nutrition, and studying in order to be strong, healthy, reliable, and eligible to play football. Another participant said, “When I had my concussion, I was always beating myself up over why this happened to me. I was in denial because I had spent so much time training in the offseason just to play football and when I got hurt, I wanted to disconnect myself from school and football for good.” Interestingly, this participant suggested how he felt a loss of motivation initially following the sport-related concussion; however, “for me, I saw it as an opportunity to grow as a person. Looking back on it now, I feel I was able to grow as a person both physically and mentally

because I know what it's like to be at the bottom, and no matter how bad my situation was, I knew it could always be something worse.”

Moreover, several participants reiterated accepting academic and athletic restrictions was the most challenging part in keeping motivation. For instance, one participant recalled, “I hated knowing that my teammates were waking up early in the morning to go for a team run, while I was hurting and recovering. But I knew if I wanted to get back to going to school, training and playing football again, I had to come to terms to accepting the recovery process with all the limitations that come with it so I could return healthy.”

In addition it was mentioned, “When I got hurt I started falling behind in class, and honestly, I lost motivation in wanting to achieve my academic goals I set out for the year.” He went on to suggest his motivation to play football directly impacted his motivation to attend school. Additionally, other participants reiterated accepting physical rest resulted in losing motivation to return to the classroom and on the playing field. For instance, not being able to practice, run, tackle, catch, throw, weight lift, attend class, and study were common thoughts suggested.

Several participants voiced their feelings and indicated a loss of motivation was evident due to a reoccurrence of injury that could lead to other diseases and/or long-term health issues. Since concussion based research has gained plenty of momentum, several participants' feared being susceptible to diseases that are associated with a concussion, such as, CTE. For instance, one participant said, “You know, I watch a lot of football on T.V and I've see a lot of ex NFL football players who've died from concussions. I don't want to put myself in that position, especially since football is only a small part of my life.” Although this participant lost motivation on whether to return to football, his motivation towards attending and succeeding in school never

wavered. He recalled, “at the end of the day, I know I won’t be able to make a career out of football, I’m just thankful that I can rely on my grades to the point where I’ve put myself in a position to pursue a career in my field of studies once I graduate.”

Moreover it was recalled by another participant, “I’m only in my early 20s, and I have my whole life ahead of me. At the time of my injury I told myself I wasn’t going to play again and risk being brain dead by the time I’m in my 40s because you see a lot of former professional football players who literally went crazy from CTE and I wasn’t willing to put myself in that position. Especially since, at the end of the day I want a family and kids. I don’t want to be the type of dad who doesn’t have proper brain function to play with their kids.” It is important to note that this participant returned to football as this was his initial thought post-concussion.

Furthermore, another participant explained how his sport-related concussion injury affected his motivation not only on the playing field, but also in school and his general lifestyle. For example, “As soon as I was cleared and ready to play again, I knew I wasn’t as motivated as I was prior to the injury because it impacted my performance in school and football. I wasn’t motivated enough to put the time and effort necessary to be successful and it showed on the field. I lost my starting spot to a second-year player, I zoned out and hardly focused in class, I didn’t work out at all, and I had the worst diet possible and quickly gained a lot of weight.” After taking some time to reflect on the season, this participant ended up returning to football for the “love of the game”.

Additionally, recovering from a concussion can require a significant amount of time off from academics and athletics, which can lead to a loss of motivation in the classroom and/or on the playing field for student-athletes. For instance, one participant recalled, “I lost a lot of motivation during the long recovery time. And even after I returned, I still found myself not

having the same drive I once had before my injury. All I could think about was how this wasn't fun anymore. Personally, I'm not a big fan of school, and football gave me a reason to do well in school so I could stay eligible."

*Table 3 Total results for loss of motivation*

Loss of Motivation	Number of participants affected
<b>Total:</b>	12/12

*\*Table 3 indicates the total number of varsity football student-athletes who explained a loss of motivation following a sport-related concussion.*

***Loss of Social Identification***

Sport involvement, especially at the U Sports level can play a significant role in a student-athletes social identification as expressed by the participants in this study. Several participants shared how they felt a loss of social identification following a sport-related concussion. For instance, participants were asked to rate the scale in relation to social identification (See Appendix E).

In addition, all participants in this study either agreed or strongly agreed that people would be surprised if they had stopped being involved in athletics and that other people such as their friends, family, and peers think that athletics is important to them. In contrast, more than half of the participants slightly agreed with people thinking of them as a member of the Athletics community, while the rest slightly disagreed. The strongest commonality between the participants who voiced a loss of social identification was the difficulty of no longer associating and identifying themselves as student-athletes following the sport-related concussion.

For instance, one participant recalled, “Since I was 10 years old all I did was eat, sleep, and play football. When you devote so many hours per day for the majority of your life, doing something that you’re passionate about, the feeling of being stripped away from your passion is huge. I started to identify myself as an athlete-student instead of student-athlete. My recovery process took over many months to fully recover, and during that time, I felt like a phony telling people that I’m a football player, because at the time, I wasn’t playing obviously. I’d say it was an important time in my life because I learned to re-evaluate my values and priorities, and try to develop interests and find other passionate things in my life that I had been neglecting since I mainly focused on football.”

Additionally, another participant reiterated, “I definitely went through a period of having an identity crisis when I was recovering from my concussion. When you’re taken away from the game for so long, you start to question whether you’re still a student-athlete. For as long as I could remember I would associate myself with being a student-athlete, when in reality, I was just a student recovering from a concussion. The fact that I was struggling with associating myself as a student or student-athlete bothered me for many days during recovery.” Moreover, another participant made it important to highlight to be more than the “uniform” to any current or future student-athlete going through a similar situation. He suggested, represent the “uniform” with honour, and play your “heart out”, but do your best to not solely associate and identity yourself with that. The reason being, “there will be a time when the uniform comes off for good, make sure you know who you are outside the uniform so that you don’t have to go through an identity crisis like I went through.”

Another participant mentioned how he was not aware and prepared to deal with the emotional problem of losing his social identification following his sport-related concussion

injury. He recalled, “It’s not like there’s a handbook of what you’re going to feel or deal with when you have a concussion especially since everyone deals with concussion injuries differently, but I guess for me, I was so oblivious and would never think I’d feel like a part of me was being taken away. So when the time came, it kind of all hit me at once and I was not prepared to deal with it. It was definitely a challenging time in my university career.” As well, it was discussed how identifying himself as a student-athlete led to several benefits, including a strong sense of who you are, self-confidence, and increased self-discipline; however, he explained various emotional challenges in relation to social identification following a sport-related concussion. For instance, being sidelined for a long period of time led to a loss of identity and confidence that resulted in “feeling vulnerable, especially when I have a strong sense of identity to football and school. When football was taken away from me, I felt my self-worth sort of go away, it was extremely frustrating. Especially when a lot of my friends started asking me if I’ll ever play again. I’d say it’s definitely difficult to cope with”.

Moreover, another participant discussed how he identified himself more than just an athlete. For example, he said “football is not the most important part of my life. It’s just something I do for fun and without it, I have so many other things I can do”. He went on to suggest, being an athlete does not define him; instead, “when I couldn’t compete because of my concussion, I focused on pursuing other things that I wasn’t able to pursue since football is so demanding with so little time to really do anything else besides school and train”. Moreover, one participant mentioned how his social identification did not alter following a sport-related concussion, he stated “it wasn’t like I was going into retirement. I knew with the proper rehab that I would be able to return to school and football again.”

Although participants struggled with social identification following sport-related concussion, when asked how they identified themselves today, participants primarily identified themselves as student-athletes. It is also important to note, they all stressed the importance of being students first before an athlete. It was mentioned, “Football will always be a part of my life that’s for sure”.

*Table 4 Total results for loss of social identification*

Loss of Social Identification	Number of participants affected
<b>Total:</b>	8/12

*\*Table 4 indicates the total number of varsity football student-athletes who explained a loss of social identification following a sport-related concussion.*

***Stress, Anxiety, and Depression***

A sport-related concussion has the potential to disrupt student-athletes day-to-day academic and athletic activities and can impact the student-athletes mental health as expressed by the participants. Several participants described stress, anxiety, and depression as common mental health symptoms following a sport-related concussion.

Interestingly, participants who dealt with mental health symptoms following a sport-related concussion expressed how their symptoms affected their academic activities. For instance, it was explained, “I definitely felt stressed. Basically, I just kind of felt anxious all the time. I would sleep for 6 hours, and wake up feeling a little down and depressed. Like even trying to read and do homework was tough, so I was told not to do anything school related, but I didn’t want to fall behind so I tried my best to keep up. But even then, it was really hard and I

didn't want to do homework for the next couple of weeks. I guess I was just down and stressed". Additionally, a few other participants expressed the feeling of not wanting to fall behind academically and decided against the advice of their medical professionals to push themselves to keep up with their academic requirements; however, this only resulted in symptoms worsening, and feeling "stressed all the time".

Moreover, several participants voiced their feelings on how they rely on exercise as a means of coping with stress. For example, "Working out is huge for me, it's what keeps me calm when I'm stressed and I just enjoy it and of course when you're concussed, the first thing you're told is to rest, rest, and rest. And so, when your means of dealing with stress is stripped away from you, it can take its toll. So at times when I felt stressed, I couldn't rely on working out to get my mind off things, and this only lead to more built up stress. It just wasn't a good situation for me". Furthermore, another participant discussed how he dealt with depression when he saw his roster positioning beginning to slip away. He recalled, "Football's a next man up type of game. When I got hurt it was the next man in line to step up and fill that void. I went from being a starter to a third string player after my concussion and I'm not ashamed to admit that I felt depressed seeing my starting spot slip away from me". Additionally, one participant discussed how he went through depression after his doctor diagnosed his injury as a severe concussion; however, he noted that his depression symptoms lasted until he came to terms with accepting he would be out of the classroom and playing field for a prolonged period of time. It is important to note, some participants felt depression immediately following the sport-related concussion, while others developed depression months after concussion diagnoses.

Moreover, the participants mentioned feeling anxious at random times throughout the day for no apparent reason. For instance, participants who dealt with mental health symptoms started

feeling anxious around family members. One recalled, “My mom would invite my uncles and aunts to come over and check up on me. And I remember this one time, I felt so nervous talking to my uncle who’s like my second dad and I felt like I didn’t even know him, it was weird.” In addition, he acknowledged that he felt better about the situation with his family upon being told that anxiety is a common symptom post-concussion. Furthermore, this participant recounted, “The stress definitely took its toll on my grades. I went from being academically eligible to play football, to falling on the cusp of barely making the academic requirements.”

Furthermore, three participants mentioned experiencing anxiety in relation to re-injury following a sport-related concussion. For instance, it was mentioned, “Even when I would think about going back to practice, I had negative thoughts running through my head worried that I would get concussed again, and I wasn’t mentally ready to go through another rehab process”.

*Table 5 Total results for stress, anxiety, and depression*

Stress, Anxiety, and Depression	Number of participants affected
<b>Total:</b>	8/12

*\*Table 5 indicates the total number of varsity football student-athletes who explained stress, anxiety, and/or depression following a sport-related concussion.*

***Injury-Specific Issues***

For intrapersonal constraints, participants mentioned how various injury-specific issues associated with a sport-related concussion limited their overall ability in the academic and athletic settings. For instance, individuals cited difficulty thinking clearly, focusing,

remembering, drowsiness, and headache all made their engagement in academic and athletic activities difficult.

For participants that felt that injury-specific symptoms constrained their academic and athletic activities, it was mentioned that, “Academically, the biggest challenge for me was staying focused because I had constant headaches throughout the day and saw my GPA drop because of it”. Another participant stated, “The biggest athletic challenge for me was the physical side of things. While I was out, I physically was not cleared to practice so I tried making up for it by watching practice and game film. I found it almost impossible to focus. I ended up falling behind on the playbook, and saw my roster position slip”.

Participants were also constrained in their ability to recover quickly from a sport-related concussion and get back to their academic and athletic activities through limited knowledge on the benefits of rest. One participant stated, “I didn’t know at the time that rest meant physical and cognitive. What I mean by that is I obviously took time off the gym, doing chores like washing the dishes, but I didn’t rest my brain from cognitive things like looking over the playbook, or reviewing game film”. The participant went on to discuss how his limited knowledge on the benefits of rest only prolonged his injury unknowingly. In addition to physical and cognitive rest, one participant discussed how one of the key aspects of recovering from a concussion included mental rest, such as, avoiding social media, video games and computers.

Furthermore, for some participants, rest was hard to come by as they struggled with sleeping at night. For instance, one participant stated, “it was hard keeping the same bedtime schedule with the concussion. My sleeping habits were all over the place, I was sleeping and waking up at different times throughout the week. I even tried setting up an alarm to get my sleep habits back to normal but that still didn’t work”. This led to extreme daytime fatigue which

only created additional stress. In addition, other participants mentioned keeping your cellphone out of your bedroom to avoid screen time temptation and use ear plugs, white noise machine, or a fan as a strategy to create a good sleep environment.

*Table 6 Total results for injury-specific issues*

Injury-Specific Issues	Number of participants affected
<b>Total:</b>	7/12

*\*Table 6 indicates the total number of varsity football student-athletes who explained injury-specific issues following a sport-related concussion.*

***Internal Pressure to Return***

Another intrapersonal constraint consisted of internal pressure to return to football. Several participants intrinsically felt self-pressure to return to football following a sport-related concussion. The term ‘competitive’ served as a commonality into wanting to return to football albeit recovering from a sport-related concussion. For example, one participant mentioned “just having that competitive spirit in me I wanted to come back the next day, but obviously with my concussion circumstance it wasn’t a reality”.

Additionally, it was described that “at the time, you’re so focused on your sport and it’s all that you know in life and you want to return even if that means opening up the gate for re-injury, you don’t think about things like ‘I will have a life outside of football once I hang up the cleats’ because in that moment you’re a competitor and that’s all you can think about”. As well, another participant mentioned how he felt high levels of internal pressure to return in order to make it into the Canadian Football League. He stated, “My goal is to take my play to the next

level and play for the CFL. When I was hurt man, all I could think about were ways to return as quickly as possible because the scouts aren't going to wait on me, I need to pump out as much game film as I can to get my name out there. I'm trying to turn this sport into my fulltime career, I don't want to let the people who believe in me down either, so many sacrifices were made for me to be in this position".

Leveraging on previous comments, another participant described how his internal pressure to return to football stemmed from not wanting to let his coaches and teammates down. For instance, he recalled "we were playing (arch rival) and we got beat on a deep ball for a touchdown, and I kept beating myself up for it because that should've be me covering that receiver, not a 2<sup>nd</sup> year defensive back who has no experience playing in a panda game. My coaches and teammates rely on me to be healthy to go out and make those kind of plays for the team". He went on to say how he felt a sense of internal pressure and urgency to play, especially since it was the panda game, "you only get a few opportunities in life to play in front of 25,000 screaming fans. I wanted to get out there so bad, there was a point leading up to that week where I was like I don't care how I'm feeling I want to suit up for this game and play with my brothers".

Another participant described how he was not being truthful behind disclosing his concussion symptoms to the athletic staff in an effort to "escape concussion protocol" because he felt the process to return to competition would be long and he did not want to let his teammates down. He recalled, "The last thing I want to do is let my teammates hanging over an injury, it's crazy to say but that's how I felt".

Interestingly, it was mentioned that the idea of being "weak" played into internal pressure to return to football. For instance, one participant described how he essentially got knocked out

while participating in a tackling drill during practice and to avoid looking weak in front of his teammates he wanted to prove he was strong and tough enough so he got back in line ready to go again; however, it is important to note that a coach pulled him from the drill to seek medical attention.

*Table 7 Total results for internal source of pressure to return to football after concussion*

Internal source of pressure to return to football after concussion	Number of participants affected
Wanting to play	7
Teammates	2
Coaches	2
<b>Total:</b>	11/12

*\* Table 7 indicates the total number and source of pressure for varsity student-athletes who explained internal pressure to return.*

**Intrapersonal Factors – Facilitators**

*Prior Experiences of Enjoyment in Academic and Athletic Activities*

One notable intrapersonal facilitator consisted of participants discussing prior experiences of enjoyment in academic and athletic activities. Following a sport-related concussion some participants suggested wanting to recover as quickly and healthy as possible to be able to return to regular academic and athletic activities. For example, “I love the game. I think because I have this burning desire to play and stay eligible, it definitely helped the recovery process and probably sped up my return because I wanted to make sure I was taking the proper precautions to come back ASAP”.

In addition, another participant mentioned how his passion towards school and football served as a facilitator after being stripped away from his regular academic and athletic activities

due to a sport-related concussion. For instance, “to be honest, if I didn’t love being a student-athlete, I would’ve probably dropped out because concussions are brutal man but I’m so lucky to literally love what I do that I think that helped me want to get back into the swing of things”. Participants also discussed their passion to take part in academic and athletic activities prior to the sport-related concussion and this reminder served as a motivation of how things use to be pre-concussion. It was said, “There’s light at the end of the tunnel. I always reminded myself how things use to be before my concussion and I would feel a jolt of urge to get back”.

Interestingly, one participant noted how reflecting on prior experiences in academic and athletic activities made him grateful to get back in the classroom and on the playing field following sport-related concussion. He recalled, “It’s a blessing, not everyone gets to do what I do. Just looking back on how things were before my concussion gave me a reality check. When I was cleared to go back to football and school I made sure to appreciate every second of it because it can be taken from you just like that. So yeah I definitely think my past experiences helped with recovery for sure”.

This intrapersonal facilitator suggested that many participants who have had prior experiences of enjoyment in academic and athletic activities tended to be more motivated to return to academic and athletic activities post-concussion.

*Table 8 Total results for prior experiences of joy in academic and athletic activities*

Prior Experiences of Joy in Academic and Athletic Activities	Number of participants affected
<b>Total:</b>	7/12

*\*Table 8 indicates the total number of varsity football student-athletes who explained prior experiences of joy in academic and athletic activities following a sport-related concussion.*

### ***Seeing Health Improvements in the Recovery Process***

Seeing health improvements in the recovery process served as a facilitator for some participants. Participants explained how seeing and noticing health improvements in themselves during the recovery process provided a sense of self-confidence. For instance, when participants started noticing physical improvements (e.g. no longer feeling nauseous, dizziness or experiencing headaches) this helped motivate them towards returning to academic and athletic activities. For example, “after seeing countless doctors I finally connected with one who was able to produce a customized plan for me and I started to see the benefits from it. He talked about different forms of active rest when I started doing some of them I started seeing huge improvements in my health”.

One participant said, “From the start I tracked how I was feeling in my notebook by seeing and feeling improvements and this gave me confidence in that I’d be able to make a full and healthy return and I thought tracking my progress was beneficial too because you can see the progression of how you felt to how you’re feeling now”. In addition, another participant described how one of his coaches would always say “when you feel good, look good, train good, you play good” and for a long time he did not feel good while recovering from his sport-related concussion; however, when he started seeing health improvements during the recovery process he related and referred back to his coach’s quote and finally started feeling good. He said, “Baby steps, you won’t see drastic changes over night but just the small victories go a long way. Like I was finally able to do things around the house without getting a headache”.

*Table 9 Total results for seeing improvements in the recovery process*

Seeing improvements in the recovery process	Number of participants affected
<b>Total:</b>	4/12

*\*Table 9 indicates the total number of varsity football student-athletes who explained seeing improvements in the recovery process following a sport-related concussion.*

***Not Giving Up***

Albeit the challenges participants faced following a sport-related concussion, some participants discussed not wanting to give up by overcoming their adversity. For instance, one participant recalled, “injuries are part of the game, especially with a heavy hitting sport like football. I signed up for this knowing the risks that come with it, and with everything in life adversity can either make you or break you. I just did my best to overcome these challenges and trust me there were a lot of challenges I had to overcome”.

In addition, as part of not giving up one participant explained how he chose to stay positive even though he was in a difficult situation following his sport-related concussion. He said, “The moment you let negative thoughts seep in your head, quitting seems like the easiest way out. For me, I just chose to be positive because even though it felt like the weight of the world was pressing down on your shoulders it could always be worse”.

Leveraging on previous comments, one participant stated how he adopted an “I won’t quit mindset” as a strategy for not giving up. He went on to discuss how he was always taught there is always positivity and something to be grateful for in every situation. For instance, “setbacks are temporary, I used this setback for a bigger comeback”.

*Table 10 Total results for not giving up*

Not giving up	Number of participants affected
<b>Total:</b>	3/12

*\*Table 10 indicates the total number of varsity football student-athletes who explained not giving up following a sport-related concussion.*

**Interpersonal Factors – Constraints**

***Insufficient Social Support***

Participants encountered various interpersonal constraints. A lack of social support following a sport-related concussion were among the notable constraints. As outlined by some participants, social support following an injury can play an integral role as a coping resource in the recovery process for student-athletes. In particular, one participant mentioned, “the support from your family, friends, school, medical team, teammates and coaches can go a long way in helping you recover mentally and physically. Knowing that you have people in your corner supporting you not only from the start, but throughout the process definitely helps”. However, participants voiced insufficient social support.

As well, it was reported that some participants lacked emotional social support at the beginning of the recovery process from people outside of their immediate family. For example, “of course your family is going to be there for you, it just would have been nice if my friends and teammates could have reciprocated the same support. I only had one teammate send me a direct message over Instagram, and he basically wanted to know when I would be ready to come back and play”. Additionally, it was mentioned that support throughout the entirety of the recovery

process from the coaches would have been beneficial. For instance, “obviously the coaches are busy, and this may not be a reality but I would have appreciated just a quick weekly check-up. It makes you feel like you haven’t been forgotten”. Otherwise, the participant mentioned, “without the consistent support from my coaches, it almost made me feel like I needed to return to football almost prematurely to be a part of the squad again”.

As well, one participant identified a lack of social support from a professor. It was mentioned that, “most of my profs really understood and gave me enough time to recover and write make-up midterms and assignments as a later date, but I had this one prof and he didn’t really understand. I needed someone in the class who was willing to share their notes with me since I couldn’t go to class, and typically, the prof would either mention if someone would voluntarily do this in class or by email, but this prof refused to accommodate”. The participant noted the lack of social support from the professor as “insufficient” and discussed how this negatively impacted academic activities.

On the other hand, another participant voiced a lack of informational support from the medical team. It was described that informational support on recovery specific to concussions was not readily available, and having “at least a brochure or a pamphlet of the protocols for returning to sport and school would have helped”. Interestingly, some participants mentioned that they sought social support from members involved within their sport (football) more than members outside of their sport (family members, friends etc.); however, it was discussed having support from both ends of the spectrum would be ideal.

*Table 11 Total results for insufficient social support*

Insufficient Social Support	Number of participants affected
<b>Total:</b>	9/12

*\*Table 11 indicates the total number of varsity football student-athletes who explained insufficient social support following a sport-related concussion.*

***Lack of Awareness and Guidance***

A lack of awareness and guidance among the athletic staff regarding concussion management served as an interpersonal constraints according to several participants. Although acknowledging these athletes expressed a lack of self-awareness regarding concussion management despite numerous concussion injury headlines in professional sport, they were surprised by the lack of awareness and guidance from the athletic staff (i.e. coaches, interns and athletic trainers).

Due to a lack of prior concussion management education, the student-athletes expressed difficulty assessing the level of risk their concussion posed and so they relied heavily on the information provided by the athletic staff. However, the student-athletes were surprised by the lack of awareness and guidance. For example, one participant mentioned “I asked one of the interns if they could explain to me the concussion protocol and in return I just got a blank stare. I was a little worried because I only had basic concussion knowledge at the time and I obviously relied on them to help me through the process”. Afterwards, the participant discussed how he tried to find concussion protocols on the University of Ottawa website but fell short of finding any protocol. He stated “so after my conversation with the intern, I told myself I would just take

matters into my own hands and do some self-research and look for the uOttawa's concussion protocols online. After looking online for about 10 minutes, I gave up. I couldn't find any protocol endorsed by the university online".

Another participant mentioned how he felt the athletic staff did not provide adequate concussion management guidance. He mentioned "I believe the athletic staff lacked guidance on what a student-athlete should do post-concussion". He expressed his frustration by discussing how as a student-athlete he needed to know what to do post-concussion to make the appropriate academic and athletic adjustments. As well, he stated "I really do feel there needs to be more awareness and guidance when it comes to concussions because from my experience, I've seen a ton of athletes come back way too soon after they've been diagnosed with a concussion, and they get re-concussed in practice or in games when they do it's unfortunate to see".

Interestingly, some participants discussed how they did not receive a returning-to-learn protocol from the athletic staff following a sport-related concussion. For example, "once I got concussed, I entered a stepwise progression protocol, basically consisted of passing each stage without getting any symptoms, and if you were to experience symptoms then they'd make you go back to the previous stage and try again. Each stage is 24 hours minimum. But I never got a returning-to-learn protocol. You would think as student-athletes they would prioritize school first, but I never got one".

Furthermore, another participant expressed that since concussions are becoming more and more prevalent, coaching staff should be aware and educated around the topic. For instance, it was mentioned by one participant "coaches and trainers should be more aware of concussion education. Obviously coaches want to see their players return from injury and get back on the field to help their team win, but I feel that's the problem. Especially with an injury like

concussions, you can't rush the process and coaches need to be aware of this. From my experience, the coaching staff can tend to rush players back on the field and the chances of the player getting re-concussed are really high".

As a strategy, some of the participants mentioned implementing concussion education seminars before the season, in-season and after the season in an effort to educate the varsity football athletes due to the nature of head impacts sustained in the sport of football. By doing so, student-athletes would be able to know where to find concussion management information, such as, concussion protocols. One participant stated "I think having year-round concussion education presentations would only be beneficial for us. We would be able to know who to contact and what to do if any of us were to get concussed".

*Table 12 Total results for lack of guidance and awareness*

Lack of Guidance and Awareness	Number of participants affected
<b>Total:</b>	6/12

*\*Table 12 indicates the total number of varsity football student-athletes who explained a lack of guidance and awareness following a sport-related concussion.*

***External Pressure to Return***

Furthermore, some participants voiced external pressure to return to football following sport-related concussion. Pressure to return to football included coaches, teammates and family members. Participants mentioned how they felt pressure to return to play while recovering from injury.

Participants described pressure to return to football from coaches as either direct or indirect. For instance, one participant discussed how he suffered a sport-related concussion right before playoffs, and as such, being one of the key players on the offensive side of the ball he felt direct pressure to return from the coaching staff. He mentioned how a positional coach approached him and felt his urgency for him to return for playoffs because if they were to lose that game, some coaches and assistants jobs may be on the line. He stated, “It took me by surprise. I told myself I do not want to be the reason why people lose their jobs, but at the same time I have to look out for my best interests”. The participant ended up not returning to play prematurely for the sake of his own health and stated “I don’t want to be a vegetable with all these hits to the head when I’m older”.

As well, another participant described how he felt indirect pressure to return from coaches during team meetings. For instance, “before I was officially diagnosed, I attended a regular team meeting and during that meeting there was one coach that I felt was indirectly calling me out and pretty much saying that we need to dig deep, even with injuries, everyone has got to be able to play their role and help make this team win”. He reiterated how he felt pressure to return to football even when he was not medically ready in order to help the team win. The participant ended up returning to sport shortly after; however, he did not experience further concussion-like signs or symptoms.

Additionally, another participant discussed how there weren’t many backups for his position, especially since the backups were inexperienced he felt pressure to return from his teammates. For example, “it almost felt like peer pressure to come back and play immediately because if I didn’t, I would be letting the team down. I swear some of my teammates were guilt tripping me into returning prematurely. Any time I would see my teammates, they would say

things like ‘it isn’t the same without you bro, if we want to win we need you back on the field now’. The participant mentioned how he did not want to be seen as another player, but instead wanted to be considered a friend by his teammates who genuinely were concerned about his health first and foremost. The participant ended up returning once he was medically cleared by his doctor.

Participants expressed pressure to return to football from their coaches and teammates, one participant expressed pressure to return from his siblings. For instance, “I come from a very athletic background, my brothers all play or played at a really high level of sport, and sometimes I felt pressure from them to return. They would jokingly tell me things like ‘man up, I’ve played through way worse and turned out okay” or ‘you don’t have the luxury of missing games, the season is so short’. He explained and reiterated how they were joking but felt there was some truth to it and expressed that they were disappointed he was sidelined and not playing. The participant returned to football after receiving medical clearance from his doctor.

*Table 13 Total results for external source o pressure to return to football after concussion*

External source of pressure to return to football after concussion	Number of participants affected
Coaches	3
Teammates	4
Family	1
<b>Total:</b>	8/12

*\*Table 13 indicates the total number and source of pressure for varsity football student-athletes who explained external pressure to return following a sport-related concussion.*

***Lack of Academic Support Post-Concussion***

The effects of sport-related concussion can impact student-athletes academic activities in various ways as experienced by the participants. After being diagnosed with a sport-related

concussion, the participants required absence from academic activities. In doing so, participants had to make arrangements with their respective professors accordingly.

There were various commonalities between the participants, such as, problems paying attention, problems remembering, frustration, fatigue, and various physical symptoms. One participant explained, “When I got concussed I had trouble thinking clearly and remembering things. It wasn’t until my mom called me out on not remembering my brother’s birthday. And even after I got back to school, in class group discussions, I always felt foggy and had a tough time trying to remember recapping the reading from the night before. And my marks took a hit because of it, I wasn’t getting full participation marks on group discussions because I seriously couldn’t think clearly and contribute to the class discussion and I tried explaining that to the prof but I still lost marks because of it”. Additionally, another participant stated “my concussion injury required me to take a few weeks off school, and I had this one prof that straight up told me to drop his course because I wouldn’t succeed with the time I was missing. It sucked hearing that because that was a prerequisite course I needed to take and so I ended up dropping that course and I had to drop another course for next semester because I wasn’t able to complete the prerequisite course”.

Furthermore, as a strategy one participant mentioned creating an individualized academic plan in conjunction with the student-athletes respective professors in order to aid in the recovery process and successfully allow the student-athlete to return to the classroom healthy. He said, “I think if there was a plan in place where the student-athlete and professor could come up with an academic plan to help in terms of providing all the necessary academic accommodations related to a concussion, like having someone take notes while you’re away, preferred classroom seating

and postpone exams or assignments at a later date would make sense in my opinion because like I said before, at the end of the day we're paying tuition to hopefully get a degree".

*Table 14 Total results for lack of academic support post-concussion*

Lack of Academic Support Post-Concussion	Number of participants affected
<b>Total:</b>	6/12

*\*Table 14 indicates the total number of varsity football student-athletes who explained a lack of academic support following a sport-related concussion.*

**Interpersonal Factors - Facilitators**

***Passionate Physiotherapy and Massage Therapy Staff***

For some participants it was expressed that their respective physiotherapy and massage therapy staff served as facilitators. For example, they discussed having passionate staff served as a motivating factor for continued participation in the recovery program. By having dedicated and caring staff, this in turn created a healthy and positive environment for participants to remain involved in the recovery process. One participant recalled, "My physiotherapist and her team helped me so much. It meant a lot that they genuinely cared for my well-being and wanted to see me make improvements after every session".

In addition, it was mentioned that "it's nice when they get to know you on a personal level. Whenever I would come in for a session, they knew me by first name and would ask about my friends, family and school. Just that extra step for me meant more than they know". As well, one participant said, "I give all the credit to my physiotherapist. She was definitely the biggest

reason on why I was able to have a healthy and safe return to school and football. It's funny because I still reach out to her on occasion, that's how much of a difference she made".

Furthermore, another participant discussed how he and his father would drive 45-minutes to see a massage therapist on the other end of the city because of the service. He stated, "I would literally trek up to Kanata to go see her because that's how good she is. Physically, I felt amazing and my neck would feel so relieved and it helped with all the headaches and lack of sleep. I was able to sleep good after our sessions. And it was cool because she was a high level basketball player so we bonded over sports. We were able to relate in that sense, and having those conversations put me at ease if you will". Additionally, the participant went on to discuss how his massage therapist went above and beyond what was expected by checking up on him through weekly emails. For example, "she would email me asking how my head felt, if I was getting enough sleep and said I could always come in for an appointment whenever I wanted to. I thought that was extremely kind of her because you know massage therapist's schedules are always packed".

Participants discussed how effective communication from their respective therapist served as a facilitator. For instance, it was discussed that the therapists' communication skills played a large part in establishing a caring and trust worthy relationship with the participants. One participant said, "You can feel the passion and how much they love their job. For me, the fact that they were able to gather all the information I was giving them and then they were able to create a customized plan that made sense for me showed accurate diagnosis and guided me towards the appropriate treatment". As well, it was mentioned that "the fact that I was satisfied and trusted my physiotherapist's advice, I told myself that I would always come back to her if I

were ever need her again for any injuries or even just suggesting her to friends and family who need a physiotherapist”.

*Table 15 Total results for passionate therapy staff*

Passionate Therapy Staff	Number of participants affected
<b>Total:</b>	7/12

*\*Table 15 indicates the total number of varsity football student-athletes who explained passionate physiotherapy and massage therapy staff following a sport-related concussion.*

***Sport Psychologist***

Another interpersonal facilitator mentioned by participants included seeing a sport psychologist. Even though only a few participants sought out a sport psychologist, they discussed the integral role one can play to help athletes return after injury. The participants described how their mental skills improved following their sessions with a sport psychologist.

One participant explained how his sport psychologist helped him overcome his fear of re-injury following a sport-related concussion. For instance, “I’d say it helped a ton when it came down to just talking about how I would be worried to go into contact without any hesitation or anything. Because before my concussion, I would fly to the ball, I was more of a head-hunter, put my body on the line down after down without an ounce of fear. So after my concussion I felt fear creeping into my play and seeing the sport psych helped me get over that hump so it was beneficial for sure”.

Another participant discussed how the sport psychologist re-instilled and improved his confidence following a sport-related concussion. He recalled “I come from a high football pedigree, and they always say football is a game of confidence and momentum. You can have all the skill in the world but if you don’t have confidence in what you’re doing it is useless. The sport psychologist helped me get my swagger back. It was a reminder of what I’m capable of and boosted my self-confidence”.

In addition, for one participant the sport psychologist was able to alleviate the pressure and demand for returning to school and sport to a level of performance pre-injury. For example, “I have high expectations for myself and with that comes a lot of pressure to succeed and do well and when I was hurt I wasn’t able to train or study and so, I felt buried by the pressure of having to succeed and meet these expectations and I think the sport psych helped minimize the stress and pressure by building a new routine to allow me to succeed and reach my full potential”. Furthermore, the participant went on to discuss how his sport psychologist helped him cope with the pressures to return to football from his family and teammates. For instance, “there was certain strategies and mechanisms I was taught to do when I faced pressure to return to football. The biggest thing was communication, having open and truthful communication ended up being the biggest help for me to steer away from having to deal with the pressure to comeback to football pre-maturely”.

It was described by one participant that the sport psychologist was beneficial in terms of adjusting to being sidelined. For this participant, being sidelined from the classroom and on the playing field was new. Having to adjust to this new routine proved to be difficult; however, with the guidance of the sport psychologist, the transition from attending class and playing on the football field served as a facilitator. He recalled, “My sports psychologist was good in terms of

helping me adjust to a new regime and made me aware of some tips and tricks to stay relevant on the sideline. One tip I was made aware of was to help coach the younger guys out there and just directing them to the right spots on the field and what to look for. Just by doing something as small as that made me feel like I was still part of the team”.

Furthermore, one participant explained how he introduced positive self-talk as part of his recovery routine on the advice of his sport psychologist. He recalled, “Whenever something bad would happen in my life I would always unknowingly have really negative self-talks with myself until my sport psychologist weeded that out and flipped my negative self-talk into a more positive thing”. As a result, this participant discussed how he sought further sessions with his sport psychologist because of how useful of a service this was to him.

*Table 16 Total results for sport psychologist*

Sport Psychologist	Number of participants affected
<b>Total:</b>	4/12

*\*Table 16 indicates the total number of varsity football student-athletes who discussed a sport psychologist following a sport-related concussion.*

**Environmental Factors - Constraints**

***Return-to-Play and Return-to-Learn Protocols***

One environmental constraint participants suggested was the return-to-play and/or return-to-learn protocols. All twelve participants recalled not receiving a returning-to-learn-protocol; however, it was discussed that some were given a returning-to-play protocol. For instance, “it

wasn't until the day I officially was diagnosed with a concussion by the doctor that I got the stepwise progression protocol to return to play, but I don't remember ever getting a returning-to-learn protocol". While other participants believed there was no concussion protocol in place. For example, "at first I didn't think there was any sort of concussion policy or plan in place. I thought it was just baseline testing and return whenever you tell the doctor you're symptom free".

Furthermore, another participant discussed remembering one athletic trainer mention the existence of a returning-to-play protocol during pre-season baseline testing; however, having access in finding the protocol proved to be difficult. He stated, "I remember one of the ATs told us that we have a returning-to-play protocol for concussions, but it was never shared with the team and they never told us how we could find it online or just have a hard copy of it". Additionally, another participant mentioned, "you would think you'd be able to find it online very easily. I looked through the website, had my sister look through the website and we came up with nothing. But eventually, after a couple of hours my sister found some concussion guidelines through the OUA website, but that's it. There was no returning-to-learn protocol though".

Since all the sport-related concussions between the participants varied between occurring during the past three football seasons, participants offered different responses in their belief that a concussion protocol was in place for the University of Ottawa. One participant noted "even if we did have a protocol in place, there's a gap in terms of awareness with the student-athletes and sports services in getting that information out there".

*Table 17 Total results for return-to-play and return-to-learn protocols*

Return-to-Play and Return-to-Learn Protocols	Number of participants affected
<b>Total:</b>	12/12

*\*Table 17 indicates the total number of varsity football student-athletes who discussed return-to-play and return-to-learn protocols following a sport-related concussion.*

**Environmental Factors – Facilitators**

***Online Access to Resources for Concussion Management***

For environmental facilitators, participants stated how having online access to various resources (e.g., online articles, internet, and social media) for concussion management encouraged them to search for options in relation to increasing their concussion awareness and knowledge. One participant explained, “Like I said before, the interns weren’t able to provide concussion information, so I went online and looked it up instead. I found a lot of useful stuff just by looking at different NCAA teams’ concussion management process”. He went on to explain how he was able to grasp a deeper understanding of the concussion management process.

Furthermore, another participant suggested that social media played an integral role in adding to his overall awareness and knowledge of a concussion. For example, “I go on Instagram a lot and when I was finally cleared to use my phone I followed the account ‘Concussion Legacy Foundation’ and honestly that helped so much. They post everything and anything concussion related so I found it really beneficial. They even have a concussion email account for questions, concerns or help”. In addition, he mentioned how

he enjoyed scanning through ‘Concussion Legacy Foundation’ page on Instagram because it featured a lot of professional athletes that he looks up to and reading what they have to say about concussion held a lot of weight for him.

Leveraging on previous statements, one participant explained how social media served as a critical resource in improving his overall concussion knowledge. For instance, through YouTube he found several beneficial tips for individuals recovering from a concussion. He stated, “You’d find things like UCLA doctors talk about the challenges and what to expect after a concussion or this one time I saw a neurologist on TED Talks and it was so well done and I learned so much from it”.

Furthermore, another participant mentioned how the online tool Google Scholar helped enhance his concussion awareness and knowledge. He recalled, “You can’t trust everything you read on the internet, but with Google Scholar it’s different. The articles are written by scholars in the field and are peer-reviewed and so I think reading the articles I read knowing it was supported with evidence definitely helped my overall knowledge with concussions”. In addition, he mentioned how immersing himself in the history of concussions and how concussion management has evolved over the years added to his overall awareness and knowledge on the topic.

*Table 18 Total results for online access to resources for concussion management*

Online Access to Resources for Concussion Management	Number of participants affected
<b>Total:</b>	6/12

*\*Table 18 indicates the total number of varsity football student-athletes who explained stress, anxiety, and/or depression following a sport-related concussion.*

## Chapter 5

### **Discussion and Conclusion**

This chapter presents a summary of results for all twelve football student-athletes constraints and facilitators in the academic and athletic settings with a sport-related concussion. This chapter also presents a detailed discussion of the results, the limitations of the study, and recommendations for future research.

#### **Summary of Results**

The purpose of this study was to identify constraints and facilitators in academic and athletic settings for varsity football student-athletes with a sport-related concussion. The objectives of this study aimed to identify intrapersonal, interpersonal, and environmental constraints and facilitators in the academic and athletic settings for varsity football student-athletes with a sports-related concussion, understand how a sport-related concussion can affect academic and athletic activities for varsity football student-athletes, explore strategies how varsity football student-athletes continue academic and athletic endeavours following a sport-related concussion, and examine the effectiveness of returning-to-play and returning-to-learn protocols.

To address the objectives of this study, data were analyzed using the thematic analysis steps outlined by Braun, Clarke, and Weate (2016). Thematic analysis steps including the following six steps: 1) familiarization, 2) coding, 3) theme development, 4) theme refinement, 5) theme defining and naming, and 6) writing the report. The study was framed using the social ecological model (Sallis & Owens, 2015) and was an appropriate theoretical framework as it conceptualized the intrapersonal, interpersonal, and environmental factors that influence the

constraints and facilitators in the academic and athletic settings in varsity football student-athletes with a sport-related concussion.

Specifically, three categories of themes such as, intrapersonal, interpersonal, and environmental constraints and facilitators emerged from the data. The categories and their subsequent themes are provided in the following tables below. Themes under intrapersonal constraints and facilitators described factors including characteristics such as knowledge, attitudes, behaviour, self-efficacy, and previous personal experiences (Sallis & Owen, 2015). Themes under interpersonal constraints and facilitators described factors including formal and informal social network and social support systems such as family, work group, and friendship networks (Sallis & Owen, 2015). And finally, themes under environmental constraints and facilitators outlined factors including categories such as institutions, opportunities within communities to which individuals belong to, and accessibility to health care resources/available information (Sallis & Owen, 2015). Table 6 listed below outlines the summary of results supported by the number of participants affected for each level of the social ecological model.

*Table 19 - Summary of results*

<b>Intrapersonal constraints</b>	<b>Intrapersonal facilitators</b>
Loss of motivation (12/12 participants)	Prior experiences of enjoyment in academic and athletic activities (7/12 participants)
Loss of social identification (8/12 participants)	Seeing improvements in the recovery process (4/12 participants)
Stress, anxiety and depression (8/12 participants)	<ul style="list-style-type: none"> <li>Improved self-confidence</li> </ul>
Injury-specific issues (7/12 participants)	Not giving up (3/12 participants)

- Difficulty thinking clearly
- Focusing
- Remembering
- Drowsiness
- Headaches
- Overcoming adversity

Internal pressure to return (11/12 participants)

- Internal pressure to return from football student-athlete

**Interpersonal constraints**

Insufficient social support (9/12 participants).

Lack of awareness and guidance (6/12 participants)

- Lack of awareness and guidance from the athletic staff regarding concussion management

External pressure to return (8/12 participants)

- Coaches, teammates and family members

Lack of academic support post-concussion (6/12 participants)

**Interpersonal facilitators**

Passionate physiotherapy and massage therapy staff (7/12 participants)

- Staff is empathetic
- Staff is committed
- Staff creates positive environment
- Staff is knowledgeable about concussion management

Sport Psychologist (4/12 participants)

<b>Environmental constraints</b>	<b>Environmental facilitators</b>
Return-to-play and Return-to-learn protocols (12/12 participants) <ul style="list-style-type: none"> <li>• No return-to-learn protocol</li> <li>• Difficulty finding protocols</li> </ul>	Online access to resources for concussion management (6/12 participants) <ul style="list-style-type: none"> <li>• Reading concussion management information online through peer reviewed articles, internet and social media</li> </ul>

The findings of this study identified constraints and facilitators in the academic and athletic settings for varsity football student-athletes with a sport-related concussion using the social ecological model. Several themes in this study are consistent with previous research. For instance, constraining intrapersonal, interpersonal, and environmental factors such as: psychological response to injury such as a concussion has the potential to lead to mental health issues such as depression and anxiety, a lack of standardized protocol for returning-to-learn leaves the student-athlete vulnerable post-injury, external pressure from coaches to return athletes to participation prematurely after a concussion (Putukian 2016; Sarac et al., 2017; Ransom et al., 2015; Kroshus et al., 2015) have been uncovered in the past. Facilitating intrapersonal and interpersonal factors highlighted in this study that were also reported in previous studies were: seeing improvements in the recovery process, empathic staff, and encouragement from family (Gulliver et al., 2012; Hamson et al., 2008). In sum, there was a link with previous literature and this study’s major findings on lack of concussion awareness and knowledge, need for concussion education, pressure to return, and overall concussion management support.

However, new understandings can be derived from this research that extends on previous knowledge when it comes to intrapersonal, interpersonal, and environmental constraints and facilitators in the academic and athletic settings for varsity football student-athletes with a sport-related concussion. Previous studies had yet to use the social ecological model in understanding the constraints and facilitators. Specifically, how prior experiences of enjoyment in academic and athletic activities, passionate staff, seeing improvements in the recovery process, and online access to resources for concussion management served as facilitators.

Another interesting interpersonal constraining factor was a lack of awareness and guidance from the athletic staff regarding concussion management preventing the student-athlete from receiving appropriate care following a sport-related concussion. This in turn led to a lack of knowledge on the benefits and appropriate care for concussion management for the participants who sustained a sport-related concussion. These participants expressed a sense of disbelief and a loss of trust in the concussion management process after receiving a lack of awareness and knowledge from the staff. As a strategy, participants discussed educating the football student-athletes on the concussion management process not only during pre-season but in-season and post-season as well. By doing so, the football student-athletes would be more aware of the concussion management process (e.g. benefits of proper recovery), as well as, knowing where to find the appropriate resources to seek help (e.g. respective protocols, help-line phone number(s)/email(s), and contact information for experts in the field etc.).

Further understandings on interpersonal constraining factor pertaining to a lack of awareness and guidance from the athletic staff also arose from the findings. For instance, it was explained by some participants that healthcare professionals might be less equipped for helping

individuals with a sport-related concussion on managing and relieving symptoms related to concussion compared to physiotherapists who adopt and cater a customized recovery plan.

Moreover, participants in this study faced internal and/or external pressures to return to the classroom and on the playing field following a sport-related concussion. The pressure to return stemmed from the participant themselves or from coaches, teammates and family members. The literature has reported motivations explaining internal and external pressure to return from injury (Kroshus et al., 2015) such as not wanting to let coaches and teammates down, the desire to compete and win, and for the love of the game. The study is in alignment with motivations to return to sport following injury; however, findings revealed different perspectives on loss of motivation such as the feeling of no longer being a part of the team, not wanting the coaches and teammates pity, deterioration of self-worth, and no longer wanting to attend school without football. In addition, following the analysis of the findings and literature, this study interestingly revealed that some participant's sole motivation to attend university was to play football. That meant spending an immense amount of tuition just to play football at the university level even if that meant not finishing school to graduate with a degree, but just the opportunity to play football at this level.

Research in the past has indicated student-athletes may not have developed social identification outside of being an athlete (Gulliver et al., 2012) and if their role as an athlete is threatened (e.g. injury) they may in turn experience a loss of social identification which has the potential to lead to various mental health issues. This study showcased a loss of social identification for participants following a sport-related concussion. One participant explained the importance of student-athletes to separate themselves solely from being an athlete only, and instead, develop a sense of social identification outside of your respective sport in order to avoid

the feeling of a loss of social identification. As a strategy, a subject matter expert (e.g. former student-athlete who experienced a loss of social identification) should stop by and present the issue before or after team meetings, or incorporate it as part of the pre-season onboarding session for the student-athletes. In turn, this would at least create awareness around the issue and hopefully open the perspective of the student-athletes to think about.

Today, a major concern in public health is mental health (Eaton & Fallin, 2019) and has the potential to lead to negative health outcomes as expressed by the participants in this study. Mental health symptoms, such as stress, anxiety, and depression negatively impact some participants' academic and athletic activities following a sport-related concussion. Previous research on mental health following an injury has been well documented in the literature; however, this study focused on football student-athletes' mental health not only on the playing field but in the classroom as well. As a strategy, following an injury that takes the student-athlete away from the classroom and playing field, a sport psychologist (which is offered by the University of Ottawa for varsity student-athletes) may want to be sought out for at least one session (with an option for further sessions to be scheduled as the student-athlete sees fit), along with at least one session with the Student Academic Success Service (SASS). SASS is a service offered by the University of Ottawa and works towards facilitating the academic accommodations for students who are in need of assistance and works to incorporate customized academic accommodation plans, access to additional tools and resources for support (University of Ottawa, 2017).

Additionally, some participants discussed a lack of knowledge in regards to the benefits of physical, emotional, and mental rest following a sport-related concussion. Despite pre-season baseline testing, there is a gap in the concussion management process since participants were

unaware of the benefits of all types of rest. As a result, the institution may want to incorporate effective technique of knowledge transfer so all student-athletes are aware of the concussion management process and benefits of appropriate recovery. According to one participant, by not knowing 'rest' entailed more than that of physical rest, he saw a setback in his recovery process and only prolonged his return to the classroom and on the playing field. The literature mentioned effective concussion education not only for the student-athlete but also for the sporting staff is key in implementing effective concussion management practices (Kroshus et al., 2015).

Strategies for educating individuals on the benefits of the appropriate recovery steps post-concussion may include, providing student-athletes with resources outlining the recovery benefits, and equip healthcare professionals with the necessary information as they are often the main source of information for student-athletes post-injury. Leveraging on the concept of rest post-injury, as a strategy participants suggested removing your cellphone out of your bedroom in an effort to avoid screen time, and instead, use ear plugs, white noise machine, or a fan to create a good sleep environment.

Another intrapersonal facilitator expressed by participants in this study was seeing improvements in the recovery process. Participants reported this to be a motivating factor to stay engaged to return to academic and athletic activities. In addition, participants discussed recognizing the importance of maintaining their interest in academic and athletic activities once they noticed improvements when performing regular day-to-day tasks. Eriksson, Arne, and Ahlgren (2013) noted bringing in a social aspect to this theme explaining and seeing improvements in one's self has the ability to strengthen their belief in their ability to be successful and provide motivation.

Additionally, interpersonal facilitating factors such as having passionate and knowledgeable physiotherapy and massage therapy staff created a positive environment, which led to participants continuing and trusting the recovery process. In doing so, this served as an essential facilitator as explained by participants because it kept them from withdrawing from recovery.

Furthermore, the environmental facilitating factor of having online access to resources for concussion management through peer reviewed articles, internet and social media led increasing their overall concussion awareness and knowledge that benefited several participants which encouraged them to stay actively stay involved around concussion education. As a strategy, the institution should promote the existence of these online resources as participants in this study have expressed interest.

### **Limitations**

Limitations of this study must be acknowledged. Given the small sample size of this study where participants were recruited from one institution, it impedes findings from being generalized; however, with most qualitative research generalizability was not sought and findings may not reflect the perspective of the majority of student-athletes with a sport-related concussion at a given institution. This study included merely twelve participants, all of whom attending the University of Ottawa. Thus, due to the small sample size this study does not entirely represent the perceptions of the entire 104 varsity football student-athlete roster. As well, this study only focused on the varsity football student-athletes only; it did not include the coaches, teammates, athletic staff, professors, and/or family members. In addition, the geographical scope of this study is also limited as participants were recruited from an institution in one municipality. As well, this study may not be a complete representation of all student-

athletes as football student-athletes were only recruited for this study. Moreover, the study included one sport and only males making an unbalanced distribution of gender, which leads to a population sample that is not gender-representative.

The qualitative data collection process relies on participants' memories of past events, behaviours and perspectives; however, memory can be inaccurate at times an subject to distortion (Leedy & Ormrod, 2013) especially following a head injury. For instance, it may have been difficult to recall precisely what happened for participants who received their sport-related concussion over a year or two ago compared to those who have received their sport-related concussion this past season. Interestingly, something that was not looked at in this study is whether participants' experiences of constraining and facilitating factors were impacted by the amount of time that had passed since they had their sport-related concussion (e.g. different concussion management procedures in place such as pre-season baseline testing etc.). Albeit data regarding how long it has been since participants had their sport-related concussion was collected, the effect this has on their perspective related to constraints and facilitators was not examined. It is rational to suggest that institutions may change procedures in concussion management over a few years, especially with the momentum of concussion-based research today. Future research may want to examine this further due to the useful knowledge this can provide to theory and practice to enhance overall concussion education.

Furthermore, this study was limited by the methodology of conducting all interviews at the end of the football season. Despite the fact the interviews took place following the football season, the interviews were conducted while the varsity football student-athletes were registered in courses.

**Recommendations**

These findings have important implications for healthcare professionals who develop and implement interventions designed to bolster concussion management for this population. For instance, healthcare professionals can provide important information about concussion trends, education, resources and outcomes of health interventions that can lead to new insight regarding concussion-based research to be used for public health, research, and contribute to improvements in health care for individuals in this population. In addition, this study can be practical for coaches, educators, student-athletes and researchers to understand, and address the potential constraints a concussion can pose on academic and athletic activities.

As only one sport (i.e. football) was examined in this study, future research may want to incorporate a variety of sports to be able to draw conclusions about student-athletes from their respective sport. In addition, since male student-athletes were only interviewed, future research may want to include female student-athletes as results may differ and for inclusivity purposes. As well, the current study only sampled student-athletes from one university. Results collected from different universities has the potential to provide new insight into concussion management. Furthermore, it may be of interest to compare and contrast concussion management from different conferences around U Sports (i.e. Ontario University Athletics, Réseau du sport étudiant du Québec, and Atlantic Universities Sport).

During the data collection phase of this research, all participants' interviews were conducted subsequent the football season. It may be of interest to conduct interviews at different points during the season (i.e. pre-season, in-season, and post-season) to see how participants would respond to similar concussion management questions throughout the year to compare and contrast constraining and facilitating factors. Additionally, future research may want to look at

conducting interviews not only with the student-athletes but with coaches, athletic staff, educators, teammates, and family members as well.

Since the study used a phenomenological approach, supported with semi-structured interviews, future research may want to incorporate different sources of data collection to analyze constraining and facilitating factors for varsity football student-athletes following a concussion. For example, collecting the student-athletes' grade point average (pre-concussion and post-concussion) may reveal insight into the negative effects a sport-related concussion can pose on academic success.

**Conclusion**

Sports-related concussions are a significant public health concern for numerous varsity football student-athletes. The findings of this study derived from the thematic analysis of semi-structured interviews from the twelve participants and presented understandings on intrapersonal, interpersonal, and environmental constraining and facilitating factors in the academic and athletic settings for varsity football student-athletes with a sport-related concussion.

The application of the social ecological model helps us with classifying factors in the academic and athletic settings for varsity football student-athletes as well as identifying what types of factors are perceived the most. The constraints and facilitators identified in each level of the social ecological model (i.e. intrapersonal, interpersonal, and environmental) have important implications for understanding the academic and athletic factors for varsity football student-athletes with a sport-related concussion. The constraints and facilitators identified in this study can be utilized to design effective and level specific intrapersonal, interpersonal, and/or environmental interventions designed to help varsity football student-athletes with a sport-related concussion. For instance, the facilitators identified in this study could be utilized for future interventions to target each level in the social ecological model for varsity football student-athletes with a sport-related concussion. For example, seeking a sport psychologist and knowing the specific benefits of appropriate concussion recovery for varsity football student-athletes with a sport-related concussion can help them recover appropriately.

Finally, this study will further enhance knowledge by increasing awareness on constraints and facilitators in academic and athletic activities for varsity football student-athletes with a sport-related concussion. The findings of this study have the potential to benefit society considering that concussion based research is gaining significant momentum following recent

insight into the severe detriments a concussion can pose. The study may thus be practical for coaches, educators, student-athletes and researchers to understand, and address the potential impacts a concussion can pose on academic and athletic activities.

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Appendix A

Interview Guide

**Demographics**

- 1) Please state your age and your current year at university.
- 2) How far is your hometown from where you live now?
- 3) How familiar are you with the university and the city since you have begun school here?
- 4) Do you have trouble finding your way around campus or accessing services offered to you as a student athlete?

**Student-athlete experience**

- 5) How long have you been playing football before coming to university?
- 6) What is the most difficult part of being a member of the football program?
- 7) How do you overcome these difficulties?
- 8) How many hours a week would you say you spend on football related activities?
- 9) How many hours a week would you say you spend on academically related activities?
- 10) What personal benefits or positive outcomes would you say you gained from involvement in football programs, (either currently or in the past)? E.g. fitness, socially, self-reflective feelings...
- 11) As a student athlete, do you identify yourself more as an athlete or student, or both equally?
- 12) Which do you prefer, being a student or an athlete? Explain why.
- 13) Does the football program's social world affect your academic life and if so how?

**Sport-related concussion experience (constraints and facilitators)**

- 14) Have you suffered a sport-related concussion? And if so, when and how many?
- 15) What was it like for you when you experienced a concussion? a) Did you rest from physical and/or mental activity? b) How long did you rest? c) From what activities were you told to rest from? d) How was your concussion diagnosed? e) Was there baseline testing?
- 16) What helped you through the recovery process?
- 17) How long were you medically out of school and football?

- 18) What were the challenges you experienced?
- 19) Can you describe the academic and athletic challenges you faced following a sport-related concussion?
- 20) How did you overcome these challenges?
- 21) In what ways were you supported? a) Did you receive any accommodations?
- 22) How are/were you not supported?
- 23) How did the sport-related concussion affect your academic and athletic activities? A) Did you make any adjustments to your regular academic and athletic day-to-day activities? If so, can you please describe them?
- 24) How did you prepare to return to academic and athletic activities?
- 25) Can you describe how you continued academic and athletic activities following a sport-related concussion?
- 26) What would you like to be done differently?
- 27) Did you feel any pressure to return to academics and athletics? a) By whom? b) Please tell me about that feeling.
- 28) In what ways were you made aware of the concussion? a) Could you give me an example of when you were told about your concussion? Was there a written protocol(s) in place? If so, who administered the protocol(s)? b) To the best of your ability, can you describe the protocol(s)? c) Did you find the protocol(s) effective? Please explain.
- 29) Once you were diagnosed with a sport-related concussion, how long afterwards were you deemed safe to return to play and school?
- 30) Please describe what you think the ideal process should be after you experience a concussion?
- 31) Did you seek any resources for help?
- 32) What academic and athletic resources were you aware of?
- 33) Is there anything else you would like to share?

Appendix B

Approval Letter

26/11/2018

**Université d'Ottawa**

Bureau d'éthique et d'intégrité de la recherche

**University of Ottawa**

Office of Research Ethics and Integrity

**CERTIFICAT D'APPROBATION ÉTHIQUE | CERTIFICATE OF ETHICS APPROVAL**

<b>Numéro du dossier / Ethics File Number</b>	H-09-18-1079
<b>Titre du projet / Project Title</b>	Constraints and Facilitators in Academic and Athletic Settings for Varsity Football Student-Athletes with a Sports-Related Concussion
<b>Type de projet / Project Type</b>	Thèse de maîtrise / Master's thesis
<b>Statut du projet / Project Status</b>	Approuvé / Approved
<b>Date d'approbation (jj/mm/aaaa) / Approval Date (dd/mm/yyyy)</b>	26/11/2018
<b>Date d'expiration (jj/mm/aaaa) / Expiry Date (dd/mm/yyyy)</b>	25/11/2019

**Équipe de recherche / Research Team**

<b>Chercheur / Researcher</b>	<b>Affiliation</b>	<b>Role</b>
Wahid HAMIDI	École des sciences de l'activité physique / School of Human Kinetics	Chercheur Principal / Principal Investigator
George KARLIS	École des sciences de l'activité physique / School of Human Kinetics	Superviseur / Supervisor

**Conditions spéciales ou commentaires / Special conditions or comments**

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[www.recherche.uottawa.ca/deontologie](http://www.recherche.uottawa.ca/deontologie) | [www.recherche.uottawa.ca/ethics](http://www.recherche.uottawa.ca/ethics)

26/11/2018

## Université d'Ottawa

Bureau d'éthique et d'intégrité de la recherche

## University of Ottawa

Office of Research Ethics and Integrity

Le Comité d'éthique de la recherche (CÉR) de l'Université d'Ottawa, opérant conformément à l'*Énoncé de politique des Trois conseils* (2014) et toutes autres lois et tous règlements applicables, a examiné et approuvé la demande d'éthique du projet de recherche ci-nommé.

L'approbation est valide pour la durée indiquée plus haut et est sujette aux conditions énumérées dans la section intitulée "Conditions Spéciales ou Commentaires". Le formulaire « Renouvellement ou Fermeture de Projet » doit être complété quatre semaines avant la date d'échéance indiquée ci-haut afin de demander un renouvellement de cette approbation éthique ou afin de fermer le dossier.

Toutes modifications apportées au projet doivent être approuvées par le CÉR avant leur mise en place, sauf si le participant doit être retiré en raison d'un danger immédiat ou s'il s'agit d'un changement ayant trait à des éléments administratifs ou logistiques du projet. Les chercheurs doivent aviser le CÉR dans les plus brefs délais de tout changement pouvant augmenter le niveau de risque aux participants ou pouvant affecter considérablement le déroulement du projet, rapporter tout événement imprévu ou indésirable et soumettre toute nouvelle information pouvant nuire à la conduite du projet ou à la sécurité des participants.

The University of Ottawa Research Ethics Board, which operates in accordance with the *Tri-Council Policy Statement* (2014) and other applicable laws and regulations, has examined and approved the ethics application for the above-named research project.

Ethics approval is valid for the period indicated above and is subject to the conditions listed in the section entitled "Special Conditions or Comments". The "Renewal/Project Closure" form must be completed four weeks before the above-referenced expiry date to request a renewal of this ethics approval or closure of the file.

Any changes made to the project must be approved by the REB before being implemented, except when necessary to remove participants from immediate endangerment or when the modification(s) only pertain to administrative or logistical components of the project. Investigators must also promptly alert the REB of any changes that increase the risk to participant(s), any changes that considerably affect the conduct of the project, all unanticipated and harmful events that occur, and new information that may negatively affect the conduct of the project or the safety of the participant(s).

Germain ZONGO

Responsable d'éthique en recherche / Protocol Officer

Pour/For **Daniel LAGAREC** Président(e) du/ Chair of the **Comité d'éthique de la recherche en sciences sociales et humanités / Social Sciences and Humanities Research Ethics Board**



Université d'Ottawa  
Faculté des sciences  
de la santé

University of Ottawa  
Faculty of Health  
Sciences

## Appendix C

### Recruitment Text

#### **PARTICIPATION NEEDED FOR A STUDY ON CONCUSSION MANAGEMENT**

**Study Title:** Constraints and Facilitators in Academic and Athletic Settings for Varsity Football Student-Athletes with a Sports-Related Concussion.

Hello,

University of Ottawa Human Kinetics Masters candidate, Wahid Hamidi, has invited you to participate in a master's thesis project entitled *Constraints and Facilitators in Academic and Athletic Settings for Varsity Football Student-Athletes with a Sports-Related Concussion*. The purpose of this study is to examine constraints and facilitators in academic and athletic settings for varsity football student-athletes with a sports-related concussion. This study will contribute to enhancing research, and holds the potential to transfer knowledge to concussion protocols, awareness sessions, and the service industry in an effort to better educate, prepare, train, and provide a safe and healthy environment for varsity football student-athletes.

To participate in this study, you must speak English, reside in the Ottawa area, and currently be a full-time student and member of the University of Ottawa football team who has been diagnosed with a sports-related concussion by a medical professional.

By participating in the study, you will take part in 1 interview, lasting approximately 30-45 minutes. The interview will be scheduled at a time that is convenient for you and will take place in my office located at the University of Ottawa Mont Petit building room 410B. The interviews will be audio-recorded.

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Participating in this study is entirely voluntary. If you are interested in participating or have any questions, please do not hesitate to contact Wahid Hamidi by email or by telephone.



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Sciences

## Appendix D

### Consent Form

#### **Constraints and Facilitators in Academic and Athletic Settings for Varsity Football Student-Athletes with a Sports-Related Concussion**

**Name of researcher: Wahid Hamidi**

School of Human Kinetics

Faculty of Health Sciences

University of Ottawa

**Coordinates:** Tel: / Email:

**Name of supervisor: George Karlis**

School of Human Kinetics

Faculty of Health Sciences

University of Ottawa

**Coordinates:** Tel: ext. / Email:

**Purpose of the Study:** The purpose of this master's thesis project is to examine constraints and facilitators in academic and athletic settings for varsity football student-athletes with a sports-related concussion. The objectives of the study include the following: 1) To understand how a sports-related concussion can affect academic and athletic activities. 2) To recognize how football student-athletes continue academic and athletic endeavors following a sports-related concussion. 3) To identify constraints and facilitators to academic and athletic settings for varsity

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football student-athletes with a sports-related concussion. 4) To address the effectiveness of current returning-to-play, and returning-to-learn protocols.

**Participation:** Participation will consist of taking part in 1 individual interview lasting approximately 30-45 minutes. The interview will be audio-recorded and occur at a time of the participant's convenience and at the researcher's office located at the University of Ottawa Mont Petit building room 410B.

**Benefits:** Participation in this study will allow the participant to share relevant information with the researcher related to the master's thesis project. Furthermore, by conducting the interview, the researcher will be in a position to address the purpose of the study.

**Risks:** Psychological or emotional harm and/or discomfort may occur during the interview when discussing the sports-related concussion experiences of the student-athletes. In the event this may occur, the researcher will have resources for seeking professional help.

**Confidentiality and Anonymity:** The participants have received assurance from the researcher that the information collected will remain strictly confidential. Only the researcher and the supervisor will have access to the data and codes to ensure anonymity. The contents will exclusively be used for matters related to the master's thesis project.

**Conservation and duration of data:** The data collected (both hard copy and electronic data) will be kept in a secure manner in the supervisor's key locked office. The duration of the data conservation period will last until the completion of the master's thesis project and will be shredded afterwards.

**Voluntary Participation:** The participant is under no obligation to participate and can choose to withdraw from the study at any time and/or refuse to answer any questions. If the participant decides to withdraw, all data gathered until the time of withdrawal will be destroyed and not used for any research purposes.

**Acceptance:** I, \_\_\_\_\_, agree to participate in the above research study conducted by Wahid Hamidi of the University of Ottawa's School of Human Kinetics, under the supervision of Dr. George Karlis. By accepting to participate, the participant is in no way waiving the right to withdraw from the study.

If the participants have any questions about the study, the researcher and/or supervisor can be contacted at:

Wahid Hamidi

Masters Candidate

School of Human Kinetics

University of Ottawa |

George Karlis

Full Professor

School of Human Kinetics

University of Ottawa

If any ethical concerns regarding participation in this study, the participant may contact the Protocol Officer for Ethics in Research, University of Ottawa, 550 Cumberland Street, Room 154, (613) 562-5387 or [ethics@uottawa.ca](mailto:ethics@uottawa.ca).

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

Participant's Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Researcher's Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Appendix E

Social Identification

Statement	Strongly Disagree	Disagree	Slightly Disagree	Slightly Agree	Agree	Strongly Agree
People would be surprised if I just stopped being involved in Athletics	1	2	3	4	5	6
Other people think that Athletics is important to me	1	2	3	4	5	6
Many people think of me as being a member of the Athletics community	1	2	3	4	5	6