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PARENT-CHILD COMMUNICATION REGARDING
SPORT-RELATED CONCUSSION

A Thesis
Presented to
the Graduate School of
Clemson University

In Partial Fulfillment
of the Requirements for the Degree
Master of Arts
Communication, Technology and Society

by
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May 2020

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ABSTRACT

Extant research has discussed the importance of the social climate surrounding SRC reporting, especially the need to address parents' role in concussion management. The purpose of this study was to explore motivations and barriers to parent-child communication regarding SRC reporting via the Theory of Planned Behavior (TPB). This study analyzed the attitudes, subjective norms, perceived behavioral control, and intentions toward parent-child communication about SRC reporting with 292 parents of 1st-12th graders who play contact sports. A structural equation model (SEM) was conducted to test the TPB model. The results indicate that parents' intention toward having these conversations was determined by their attitude and subjective norm – perceived behavioral control was not a significant predictor of intention. Furthermore, parents' intention toward having these conversations was predictive of whether they sought information to aide these conversations. Additionally, the effect of parental approach to sport participation (i.e., sport-first, safety-first, and laissez-faire) on intention and behavior was assessed, however, differences between the groups were not found. The results of this thesis provide theoretical, heuristic, and practical implications for health and sport scholars and practitioners.

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TABLE OF CONTENTS

	Page
TITLE PAGE	i
ABSTRACT.....	ii
ACKNOWLEDGEMENTS	iii
CHAPTER	
1. INTRODUCTION	
Sport-Related Concussions	3
Theory of Planned Behavior.....	20
2. METHODS	39
Participants.....	39
Procedures	39
Measures.....	43
Data Analysis.....	48
3. RESULTS	52
4. DISCUSSION	55
Implications.....	63
Limitations.....	67
Future Research Directions.....	69
5. CONCLUSION.....	72
6. TABLES.....	73
Table 1.....	73
Table 2.....	75

Table of Contents (Continued)

	Page
7. FIGURES	76
Figure 1	76
Figure 2	77
Figure 3	78
Figure 4	79
APPENDICES	80
Appendix A	81
Appendix B	88
Appendix C	89
Appendix D	91
REFERENCES	92

CHAPTER ONE

INTRODUCTION

Sport-related concussion (SRC) has become a modern health crisis as 300,000 adolescent athletes report concussions every year (Schallmo, Weiner, & Hsu, 2017). A SRC is a mild traumatic brain injury (mTBI) which can occur in any sport where a blow to the head, neck, or body creates a significant impact on the brain (Muth, 2018). The effects of SRC range from acute symptoms (e.g., migraines and dizziness) to more dangerous outcomes (e.g., loss of brain functions and death) (Kroshus, Daneshvar, Baugh, Nowinski, & Cantu, 2014). SRC is specifically problematic for juvenile athletes, even for those who are high school aged, as physiological factors (e.g., the structure of the skull, neck muscle strength, and their brain cognitively maturing) increase their risk of sustaining SRC and its more severe effects (Guskiewicz & McLeod, 2011). Additionally, symptoms of SRC impede development outside of sports, including educational and social growth (Baker et al., 2015; McCrory, Collie, Anderson, & Davis, 2004). SRC is a difficult injury to prevent outside of withdrawing from sports, and as such the management of injury (i.e., assess and track symptoms, rest and rehabilitation, and decide on return to play) is the primary approach to minimize the dangers of SRC (Guskiewicz & McLeod, 2011). The first and most important step of SRC management requires athletes to report their symptoms to sporting staff as failure to do so dramatically increases an athlete's risk of long term consequences (e.g., known as *second impact syndrome*), such as death or neurological disorders (Cantu, 1998)

An understudied but crucial aspect of concussion management is the contribution

of parental communication about SRC. Parents inform athletes' decisions to return to play and are the ultimate authority on sport participation (Boneau, Richardson, & McGlynn, 2020; Register-Mihalik, Baugh, Kroshus, Kerr, & McLeod, 2017). Parent-child communication is a mediating factor in multiple health-risk behaviors (e.g., sexual behavior, alcohol and drug use, and poor nutrition) (Reisch, Anderson, & Krueger, 2006) – underscoring the influence of parents on their children's decision-making and well-being. In regards to SRC, coaches have identified parents as a potential barrier to their attempts at concussion management (Sarmiento, Mitchko, Klein, & Wong, 2010). In particular, high levels of parental sport pressure and sport-first family identity decrease parental perceptions of SRC risk for their child and parent-child communication about SRC reporting (Boneau et al., 2020; Kroshus et al., 2018). Moreover, Kroshus et al. (2018) found only two thirds of parents of youth soccer players communicated with their children about concussion reporting. Explicit parent-communication about SRC reporting has shown improvements on athletes' intentions to disclose concussion symptoms (Kroshus et al., 2019) – similar patterns have been observed for other health-risk behaviors (e.g., smoking [Otten, Harakeh, Vermulst, Van den Eijnden, & Engels, 2007], poor eating habits [Andrews, Silk, & Eneli, 2010], and physical inactivity [Reisch et al., 2006]). Multiple studies state a need for further explorations of parent-child communication about SRC reporting (Kroshus et al., 2019; Kroshus, Garnett, Hawrilenko, Baugh, & Calzo, 2015; Sarmiento, Donnell, Bell, Tennant, & Hoffman, 2019).

With this in mind, it is important for scholars, as well as health and sport

practitioners, to recognize the antecedents and barriers to parent-child communication regarding the importance of reporting SRC to adults (Kroshus et al., 2018). Previous research has identified such steps as important exploratory means of understanding and refining approaches to concussion management (Sanderson et al., 2017). These efforts are critical in light of evidence that communicative climates around concussion reporting are predictive of athletes' intentions to disclose SRC to sporting staff (Cranmer & LaBelle, 2018; Register-Mihalik et al., 2017). One theoretical framework which has shown promise predicting behavior is the Theory of Planned Behavior (TPB) (Ajzen, 1985), which is noted for its usefulness in understanding and optimizing health-related behaviors and communication (Montano & Kasprzyk, 2008). Therefore, the purpose of this thesis is to utilize the TPB to better understand the predictors of parent-child communication about reporting SRC.

The following review of literature centers around two areas of study pertinent to the objectives of this research: (a) sport-related concussion and (b) the Theory of Planned Behavior.

Sport-Related Concussions

Sport-related concussion is described as an mTBI that occurs when force impacts the head (either directly or indirectly), or a moving object strikes the head during sport participation (Muth, 2018). These head injuries occur most commonly in contact sports that feature high-impact collisions (e.g., football, soccer, & wrestling) (Anderson & Kian, 2012; McCrory et al., 2013). The contexts of sports and physical activity account for 20% of all traumatic brain injuries in the United States (U.S.) (McCrea, Perrine, Niogi, &

Härtl, 2013). Sport-related concussions represent 9% of all U.S. high school athletic injuries (Gessel, Fields, Dick, & Comstock, 2007). In a sample of 100 randomly selected U.S. high schools, the occurrence of SRC was found to be especially high in the sports of tackle football, soccer, wrestling, basketball, hockey, and lacrosse (Marar, McIlvain, Fields, & Comstock, 2012).

The severe consequences of SRCs have garnered significant media attention following the deaths of professional athletes within the past two decades, such as National Football League (NFL) players Mike Webster and Junior Seau (Fainaru-Wada, Avila, & Fainaru, 2013; Laskas, 2015). The topic of concussion has become part of America's popular discourse because of its prevalence at all levels of sports and the media coverage provided to the SRC-related deaths of professional and amateur athletes (Anderson & Kian, 2012). As such, SRC has become a cultural issue of importance and the focus of much scholarly research (Anderson & Kian, 2012; Bell & Sanderson, 2016; Wilbur & Myers, 2016).

What is a concussion. Initial medical research of SRC was devoted to understanding the nature and symptoms of concussions. A concussion is “a complex pathophysiological process affecting the brain, induced by traumatic biomechanical forces” (McCrorry et al., 2013, p. 250), or more simply damage to the brain caused by direct or indirect forces which make the brain hit the inside of the skull. Classified as traumatic brain injury (TBI), concussions are a subset of TBI and are most related to mild traumatic brain injury (mTBI) (McCrorry et al., 2013). All injuries which disrupt normal brain functioning and are caused by an impact or penetration to the brain are classified as

a TBI (Menon, Schwab, Wright, & Maas, 2010). A concussion is most related to an mTBI because both entail a change in brain functioning for a brief period following a concussive impact -- whereas higher levels of TBI involve more enduring trauma and symptoms (McCrea et al., 2013). However, the designation of mTBI or concussion does not mitigate the seriousness of the injury.

The initial symptoms of a concussion fall within four categories: physical (e.g., headache or loss of consciousness), cognitive (e.g., feeling like in a fog or slowed reaction times), emotional (e.g., lability or irritability), and sleep disturbances (e.g., insomnia) (McCrea et al., 2013; McCrory et al., 2013). These initial symptoms are typically disturbances to brain functions rather than structural injuries to the brain (McCrory et al., 2013). However, the long-term consequences of concussion can include permanent behavioral and cognitive impairments (Kroshus, Daneshvar, et al., 2014). While one concussion may not lead to these long-term consequences, especially with proper concussion management, repetitive or multiple concussions significantly increase the chance of permanent impairments to the brain (Stein, Alvarez, & McKee, 2014). These detriments have garnered SRC injuries significant attention in medical research (McKee et al., 2009).

One of the most notable diseases caused by multiple concussions – as well as smaller repetitive hits – is chronic traumatic encephalopathy (CTE) (Anderson & Kian, 2012). CTE is a progressive neurodegenerative disease linked to repetitive head trauma (McKee et al., 2009; Stein et al., 2014). The initial symptoms are subtle and involve “irritability, impulsivity, aggression, depression, short-term memory loss and heightened

suicidality” (Stein et al., 2014, p. 1). However, the symptoms slowly worsen over time and lead to greater behavioral and cognitive deficits, ultimately leading to dementia and decreased lifespan (Anderson & Kian, 2012; Stein et al., 2014). Currently, there is no way to diagnose CTE during life, and research is inconclusive about the specific severity or recurrence of head trauma needed to cause CTE (McKee et al., 2009; Stein et al., 2014). Brains posthumously diagnosed with CTE are characterized with the loss of brain cells (i.e., atrophy) and the buildup of abnormal proteins (e.g., tau and amyloid), which gather around areas of the brain affected by trauma and speed up atrophy (Baugh et al., 2012; Stein, Alvarez, & McKee, 2015). While these abnormal proteins are associated with other neurodegenerative diseases (e.g., Alzheimer disease), the protein patterns found in brains diagnosed with CTE are distinct from other diseases (Baugh et al., 2012). Research suggests years of exposure to head trauma, not the number of concussions, is associated with the aggregation of tau protein suggesting chronic and repetitive head trauma is the key driver of CTE (Stein et al., 2015). Therefore, the thousands of subconcussive hits athletes endure in a season or career in contact sports make these athletes a high-risk population for CTE (McKee et al., 2009). While the only proven means of preventing sport-induced CTE is ceasing sport participation, self-reporting of symptoms and proper concussion management (e.g., return to play policies) reduce the impact of SRC and the likelihood of CTE (McKee et al., 2009).

In addition to CTE, medical researchers have identified additional consequences of SRC, especially for those sustaining sequential injuries. Second-impact syndrome (SIS) is when an athlete experiences a second episode of trauma before his or her brain

has fully healed from a prior concussion or mTBI; resulting in “a severe and irreversible rise in intracranial pressure due to unregulated brain edema and can result in death” (Rosenbaum & Arnett, 2010, p. 45). To put it differently, a second concussion to a brain that is currently healing from a prior head injury can greatly increase swelling of the brain and pressure within the skull which leads to death. This syndrome is noted as a rare but catastrophic disease, which has only been reported in case studies examining adolescents (i.e., primarily teenagers) (Guskiewicz & Mcleod, 2011; McCrea et al., 2013; Rosenbaum & Arnett, 2010).

Adolescents are especially at risk because they require a greater minimum recovery period to recover from a concussion, as their brains are not fully developed (Rosenbaum & Arnett, 2010), whereas typical adults can recover in 5-10 days. Thus, SIS is suspected to occur only in adolescent patients (Rosenbaum & Arnett, 2010). The primary means of minimizing SIS risk is via concussion management, specifically the initial and early detection of SRC symptoms and the implementation of longer return to play protocols (Kutcher & Eckner, 2010; McCrea et al., 2013). Unfortunately, in addition to their developing brains, young athletes often continue to play with mild SRC without reporting their symptoms to sporting staff (Chrisman et al., 2013). The importance of diagnosis and prevention, as well as the severe health effects of concussions (i.e., CTE and SIS), make SRC an issue of social importance – deemed by many as a pressing public health crisis (Stein et al., 2015; Weibe, Comstock, & Nance, 2011).

Social importance. The social significance of SRC and its consequences are evident in the data addressing the prevalence with which it occurs and the extent to which

it serves as the focal point of mass and social media. The pervasiveness of SRC first garnered public attention around professional athletics – notably NFL players (e.g., Mike Webster, Terry Long, Junior Seau) (Cantu & Hyman, 2012). Athletes’ public commentary regarding sustaining SRC (e.g., Troy Aikman) and their framing of early retirements as preventative measures (e.g., Chis Borland, Andrew Luck, Patrick Willis, Calvin Johnson, and Rob Gronkowski) further underscores the prevalence of these injuries (Cassilo & Sanderson, 2018; Davis, 2019; Ezell, 2013).

While the risks of SRC for professional athletes are recognized, young athletes are a larger and more vulnerable population. Over half of high school students in the U.S., 7.98 million, participate in at least one organized sport during the school year (National Federation of State High School Associations [NFHS], 2018). The U.S. Centers for Disease Control and Prevention (CDC) indicates that over 15% of these students sustained one concussion, with 6% reporting two or more, during sports or physical activity within the previous year (DePadilla, Miller, Jones, Peterson, & Breiding, 2018). In total, CDC research estimates there are 1.6 to 3.8 million treated and untreated SRCs each year in America (McCrea et al., 2013). These data indicate sport participation among juveniles is pervasive but accompanied by a considerable risk of SRC.

In response to the risks to sports participants, many private and government organizations support SRC research through grant funding. For example, since 2016, the NFL has contributed \$35 million to concussion research and, in 2019, the National Institutes of Health (NIH) funded \$114 million in grant applications on TBI research (Maske, 2018; National Institute of Neurological Disorders and Stroke [NINDS], 2019).

While the NFL allocated the majority of the funds towards research for safer helmet technology, both examples and many other grants are aimed to understand the effects and causes of head injuries (Maske, 2018; NINDS, 2019). Past funded medical research has accomplished notable strides in understanding the effects, diagnosis, and treatment for TBI (NINDS, 2019). However, how to decrease sport-related TBI is still a heavily debated topic.

The discourse surrounding SRC has significantly rose over the years, primarily because of increased media coverage (Ahmed & Hall, 2017; Anderson & Kian, 2012; Cassilo & Sanderson, 2018; Sanderson, Weathers, Grevious, Tehan, & Warren, 2016; Schwartz, 2017; Wilbur & Myers, 2016). For example, films and documentaries, such as *Concussion* (Scott, Woltroff, Cantillon, Scott, & Shuman, 2015) and the *League of Denial* (Kirk, 2013); individual players' stories about their experience with SRC and CTE, such as high school football player Zac Easter's (GQ Sports, 2017); books about the concussion crisis in sports, such as *Concussions and Our Kids: America's Leading Expert on How to Protect Young Athletes and Keep Sports Safe* (Cantu & Hyman, 2012); and magazines dedicating special issues to SRC, such as a special issue of *Sports Illustrated* titled "Concussions" (King, 2010) have generated public discussion of SRC and CTE. These media have raised SRC into the public consciousness, as related topics are commonly discussed among sports fans and the general public on social media (Bell & Sanderson, 2016; Cranmer & Sanderson, 2018; Wilbur & Myers, 2016). This discourse helps to construct the meaning and significance of SRC, and has inspired research and policy changes aimed at SRC prevention, treatment, and management protocols.

Treatments. Initial efforts in decreasing SRC were primarily geared toward prevention. Many contact sports created mandatory equipment policies (e.g., helmets, padding, mouthpieces) to reduce collision forces on the head, neck, or spine (McCrorry et al., 2004; McCrorry et al., 2013). However, the prevention of SRC through external equipment has now been disproven as the forces still impact the brain as it collides against the inside of the skull (McCrorry et al., 2004; McCrorry et al., 2013). Even worse, equipment creates risk compensation whereby athletes donned in mandatory equipment believe they are safer and thus engage in riskier play and more impactful collisions (McCrorry et al., 2004; McCrorry et al., 2013). Exercise and physiology research also forwards neck strengthening techniques to reduce the force exerted on brains during collisions but have found limited success (Benson et al., 2013; Hrysomallis, 2016; McCrorry et al., 2013). Lastly, sports leagues instituted policy changes altering styles of play (e.g., zero tolerance for head contact) (Krolikowski et al., 2017). Yet, empirical research on the efficacy of these policy changes is inconclusive and rare (Benson et al., 2013; Krolikowski et al., 2017; McCrorry et al., 2013). Given that preventative efforts have garnered limited or no success in decreasing SRC, many sports scholars and practitioners focus on issues related to SRC management.

The management of SRC begins with the ability to diagnose when an athlete has suffered a concussion. Initial efforts utilized neuroimaging (e.g., CT or MRI scan) to diagnose SRC; however, the use of this technology has been ineffective (McCrorry et al., 2004; McCrorry et al., 2013; Muth, 2018). Without being able to observe SRC in scans of brains, scholars have created protocols to track athletes' cognitive abilities and to identify

those who are symptomatic or asymptomatic. The most commonly utilized protocols to assess SRC are those that consider athlete reaction or mental acuity tests -- often administered via computers, verbal, or written exams and under the supervision of athletic trainers (McCrory et al., 2004; McCrory et al., 2013; Muth, 2018). These protocols are administered prior to athletes becoming symptomatic (i.e., a baseline obtained prior to the season) and continually following suspected brain trauma (McCrory et al., 2004; McCrory et al., 2013; Muth, 2018). Baseline testing before a season is a crucial aspect of concussion management that allows medical staff to identify when athletes return to normal cognitive functioning (McCrory et al., 2004; McCrory et al., 2013).

The determination of when concussed athletes may return to play is a significant aspect of concussion management. For athletes' safety, they should be removed from play until completely asymptomatic; this may take days or multiple weeks. Over which time, athletes may gradually increase their levels of cognitive and physical activity (Guskiewicz & Mcleod, 2011; Muth, 2018). While there have been strides in SRC protocols and treatments, the implementation of these efforts is dependent upon athletes self-reporting their symptoms. Unfortunately, athletes often do not disclose their experiencing of SRC symptoms to adults (Kroshus, Baugh, Stein, Austin, & Calzo, 2017; Kroshus, Garnett, Hawrilenko, et al., 2015).

Self-reporting. Research estimates between 30-60% of athletes with concussive symptoms fail to report them, depending on the sport and level of play (Kaut, DePompei, Kerr, & Congeni, 2003; McCrea, Hammeke, Olsen, Leo, & Guskiewicz, 2004; Meehan,

Mannix, O'Brien, & Collins, 2013; Register-Mihalik, Linnan, et al., 2013; Torres et al., 2013; Williamson & Goodman, 2006). In other words, many athletes who experience SRC symptoms (e.g., high school football players) continue to play and practice without informing coaches, medical staff, or parents (Chrisman et al., 2013). This sizeable percentage of unreported SRC has been attributed to the use of different terms for concussion across medical disciplines, the nonspecificity of concussion symptoms, and athletes' lack of knowledge about SRC (Chrisman et al., 2013; McKinlay, Bishop, & McLellan, 2011; Miyashita et al., 2014).

First, there is no unanimously agreed on definition or criteria for concussions across medical fields – causing varied usage of TBI terminology amongst medical professionals (Kennard, McLellan, & McKinlay, 2018; McCrea et al., 2013). Across literature one can find various terms – such as concussion, mTBI, and mild head injury (mHI) – are utilized to refer to SRC; even though each have different sets of symptoms and standards for diagnosis (Kennard et al., 2018; McLellan, Bishop, & McKinlay, 2010; Wills & Leathem, 2001). In terms of diagnosis, concussion differs from mTBI in that concussions do not require loss of consciousness as a symptom (McCrea et al., 2013). Moreover, journalists, media analysts, and the general public often use colloquial terms, such as “head knock,” “ding,” “bell rung,” and “bellringer,” which have no connection to medical terminology and minimize the seriousness of SRC (Broglia et al., 2014; Miyashita et al., 2014; Pearce, Young, Parrington, & Aimers., 2017; Register-Mihalik, Guskiewicz, et al., 2013; Register-Mihalik, Linnan, et al., 2013).

Second, concussive symptoms are difficult for athletes to identify and specifically

associate with SRC, as many symptoms could be explained by alternative causes (e.g., dehydration, a migraine, or a head cold) (Chrisman et al., 2013). It is easy for young athletes to confuse the source of their symptoms and by doing so, not report a potential SRC to adults. This reality underscores the importance of ensuring that athletes are self-aware and able to recognize potential symptoms of SRC.

Third, athletes' ignorance about SRC symptoms is a major cause of under or non-reporting of SRC. Many athletes are either unable to recognize or unaware of the seriousness of concussion symptoms (Bramley, Patrick, Lehman, & Silvis, 2012; Kroshus, Baugh, Daneshvar, & Viswanath, 2014; Register-Mihalik, Guskiewicz, et al., 2013; Register-Mihalik, Linnan, et al., 2013). In response, numerous informative campaigns (e.g., the CDC's Head-Up campaign) have focused on educating athletes about the symptoms and consequences of SRC (Register-Mihalik, Linnan, et al., 2013; Sarmiento, Hoffman, Dmitrovsky, & Lee, 2014). However, these educational initiatives have not decreased the percentage of unreported SRC (Chrisman et al., 2013; Kroshus, Daneshvar, et al., 2014; Kay, Welch, & McLeod, 2015). This evidence indicates that even when athletes are knowledgeable about SRC symptoms and consequences, they continue to play without disclosing potential injuries (Chrisman et al., 2013; Kay et al., 2015). Multiple social, psychological, and cultural barriers explain why informed athletes do not disclose SRC symptoms.

Barriers to reporting. There are cultural, psychological, and social barriers preventing athletes from disclosing SRC symptoms. The culture of American sports is one rooted in traditional forms of masculinity (i.e., hegemonic masculinity), which

informs athletes' beliefs about injury and pain (Anderson & Kian, 2012). *Hegemonic masculinity* may manifest within a combination of tropes and traditional male-associated values: "(1) physical force and control, (2) occupational achievement, (3) familial patriarchy, (4) frontiersmanship, and (5) heterosexuality" (Trujillo, 1991, p. 291). These characteristics inform a cultural ideal of the desirable masculine character (Connell, 1990). Young athletes conform to these ideals through sports as they are taught to be competitive, violent, aggressive, and disciplined (Furness, 2016). Female athletes have also been found to uphold traditionally masculine norms, which informs their unwillingness to disclose SRC (Kroshus, Baugh, et al., 2017).

Moreover, salient cultural narratives within sport promote not reporting injuries, such as the warrior narrative (Anderson & Kian, 2012; Cassilo & Sanderson, 2018; Foote, Butterworth, & Sanderson, 2017; Furness, 2016; Sanderson et al., 2016). The *warrior narrative* encourages players to view their body as a weapon, and sacrifice their health and body for competitive success (Anderson & Kian, 2012; Furness, 2016; Jansen & Sabo, 1994; Messner, 1990; Sabo, 2004; Sanderson et al., 2016). The key area of concern within the warrior narrative – at least in regards to SRC – is the focus on enduring pain. This narrative upholds the *pain principle*, which asserts pain is necessary to develop one's character and manhood (Sanderson et al., 2016). The pain principle is taught through masculine-establishing discourse (e.g., "man up," "no pain, no gain," "pain is temporary, pride is forever") across sporting environments (Anderson & Kian, 2012, p. 155).

These masculine ideals are ingrained in athletes from the time they start playing

organized sports and continue throughout their careers (Sanderson et al., 2016). For example, many high school athletes believe they are supposed to play injured (Chrisman et al., 2013). Sports media contributes to masculine-establishing discourse by praising players who play through injury (Sanderson et al., 2016). Sports commentators openly laud players who suffer a concussive impact and continue play (Cusimano, Chipman, Volpe, & Donnelly, 2009; McLellan & McKinlay, 2011; Pearce et al., 2017), while downplaying the seriousness of head injuries by ignoring the medical attention needed for injured players (Kennard et al., 2018; Pearce et al., 2017). Therefore, athletes are socialized to view violent collisions and pain with less concern than non-athletes. Sporting culture, thus, creates stigma around reporting SRC and encourages risk-taking behavior among athletes.

Second, there are psychological barriers that inhibit SRC reporting, including athletic identity. Participation in sports is an important experience for adolescents, especially males, within American culture (Messner, 1990). The foundation of many athletes' identities and social lives revolve around sports (Lininger, Wayment, Huffman, Craig, & Irving, 2017). Therefore, many athletes view their membership and contributions toward sports teams in high regard. Unsurprisingly, as athletes' sporting identities increase, the more they value participating in games or practice, even if injured (Chrisman et al., 2013; Kerr, Register-Mihalik, Kroshus, Baugh, & Marshall, 2016; Kroshus, Baugh, Daneshvar, Stamm et al., 2015; Sanderson et al., 2017). For instance, athletes pressure team athletic trainers to return them to play sooner than medically advisable (Kroshus, Baugh, Daneshvar, Stamm et al., 2015). Their desire to play through

pain is often attached to the importance they place on preserving a role within their teams and contributing to collective efforts (Sanderson et al., 2017). In conjunction with sporting culture, athletic identity compounds the difficulty that athletes have with reporting SRC (Kroshus, Kubzansky, Goldman, & Austin, 2014).

The final barrier to athletes reporting SRC is social influence. Simply, athletes consider their social relationships with other sporting stakeholders (e.g., coaches, teammates, and fans) prior to disclosing SRC symptoms (Cranmer & LaBelle, 2018; Sanderson et al., 2017). These relationships influence disclosure through the degree to which they may foster guilt or stigma. First, athletes seek to avoid feeling as if they let their team or coaches down, as reporting SRC and the subsequent recovery time prohibit their contributions toward team efforts (Chrisman et al., 2013; Kerr et al., 2016; Sanderson et al., 2017). In other words, by being removed from play, athletes are unable to assist their teams during competition and coaches or teammates may experience negative affective reactions to defeat – circumstances associated with regret and guilt for athletes (Turman, 2005, 2007). Second, social stigma that informs team norms may create perceptions among athletes that reporting SRC symptoms will damage relationships. This stigma is evident in hegemonic sporting cultures (Messner, 1990) and public discussions of athletes' injury decisions or policy changes instituted to reduce injuries (Cranmer & Sanderson, 2018; Sanderson et al., 2016). Moreover, the effects of stigma are moderated by the perceived reaction of the sources of SRC symptom disclosure; simply, secure relationships defined by compassion and concern are more resistant to the effects of stigma on SRC reporting (Cranmer & LaBelle, 2018).

The barriers to adolescent athletes' SRC reporting are shaped and reinforced by influential figures (e.g., parents and coaches) (Register-Mihalik et al., 2017). Unfortunately, athletes often face pressure to play through injuries from teammates, coaches, and parents (Kroshus, Garnett, Hawrilenko, et al., 2015; Register-Mihalik et al., 2017). Athletes often comply with these pressures due to the loss of social (e.g., playing time from coaches or affection from parents) and financial capital (e.g., athletic scholarships and tuition money) they may endure (Kroshus, Garnett, Hawrilenko, et al., 2015). Many parents promote this pressure due to the financial burden they take on with the rising costs of youth sports (Hyman, 2009, 2012). American culture's obsession with athletics creates the impression that sports are the sole provider of a better life (i.e., through a college education or professional sports career) for many young athletes, which influences coaches' and parents' attitude toward minimizing the seriousness of injuries (Hyman, 2009). This predicament creates an unreceptive social environment toward athletes who report SRC symptoms (Kroshus, Garnett, Hawrilenko, et al., 2015)

Disclosure of any personal condition, including the experience of SRC symptoms, is a relational process, as individuals consider their closeness and ability to predict responses to disclosures prior to sharing health information (Greene, 2009). These assertions are also true for athletes' SRC reporting, as coach and teammate support increases the likelihood of SRC reporting (Baugh, Kroshus, Daneshvar, & Stern, 2014; Cranmer & LaBelle, 2018; Kroshus, Garnett, Baugh, & Calzo, 2016; Register-Mihalik et al., 2017). However, explicit and clear communication is needed as athletes often misperceive team reporting norms – believing non-disclosure is more valued than

disclosure (Kroshus, Garnett, Baugh, & Calzo, 2015). These preliminary findings offer evidence that the social referents for adolescent athletes are important determinants in their responses to and management of SRC; so much so that Register-Mihalik et al. (2017) called for continued research regarding the influence and role that these individuals have on athletes' reporting of SRC symptoms. One of the most important referents, who are unfortunately often overlooked within SRC research, are parents and guardians of young and adolescent athletes (Boneau et al., 2020).

Parents' role in SRC disclosure. Many parents are aware of SRC, see it as a critical issue, and seek information about this type of injury, especially when their child is between 10-13 years old and transitioning into a contact sport (Asante-Bio, 2011; Bloodgood et al., 2013; Gourley, McLeod, & Bay, 2010). Some parents strongly believe there is a connection between SRC and CTE (Kroshus, Chrisman, & Rivara, 2017). However, the percentage of parents who fall into these beliefs and levels of awareness changes based on demographics (e.g., socioeconomic status) (Bloodgood et al., 2013; Lin et al., 2015). While awareness and information about SRC are more abundant, many parents have misconceptions about the nature and consequences of these injuries (Kroshus, Chrisman, et al., 2017). For instance, some parents consider the number of concussions as a deciding factor for ceasing sports participation, whereas clinicians view this as an imprecise determinant because of the endemic underreporting of SRC (Kroshus, Chrisman, et al., 2017). These misconceptions are why educational initiatives have been created for parents, such as the CDC's Heads Up to Parents program (Bloodgood et al., 2013). However, even with general knowledge and awareness, parents

still have difficulty identifying symptoms of concussion (e.g., sleep difficulties and emotional irritability) in their children (Coghlin, Myles, & Howitt, 2009; Gourley et al., 2010; Mannings, Kalynych, Joseph, Smotherman, & Kraemer, 2014; Stevens, Penprase, Kepros, & Dunneback, 2010). Therefore, athletes who are experiencing SRC symptoms are still the most reliable and efficient sources for identifying concussions. However, parents have an important role to play in motivating and encouraging SRC disclosures from their children. Put differently, understanding how parents may promote athletes' disclosures of SRC symptoms via parent-child communication may prove more fruitful than trying to teach parents how to identify SRC symptoms in their children.

Parental behavior and communication about SRC reporting shapes athletes' beliefs and behaviors across numerous facets of sporting experiences – arguably including disclosing SRC symptoms (Kroshus, Garnett, Hawrilenko, et al., 2015). Parents play a central role in adolescent athletes' sports participation decisions (e.g., through role modeling, direct conversations, and logistical support) (Boneau et al., 2020; Dixon, Warner, & Bruening, 2008; Fredricks & Eccles, 2005; Holt, Taminien, Black, Mandigo, & Fox, 2009). Specifically, parents have a significant role in the assumption of risk to their children's health via their signing of consent forms for participation in contact sports (Boneau et al., 2020; Register-Mihalik et al., 2017; Cournoyer & Tripp, 2014). While some families are concerned with the health risks, especially SRC, associated with playing contact sports, many parents explicitly or implicitly engage in anti-social forms of pressure to play through injuries or to prioritize participation over well-being (Boneau et al., 2020; Kroshus, Garnett, Hawrilenko, et al., 2015). Competitiveness and desire for

their child to earn athletic achievement causes parents to pressure their children to play through injury, as a means of confirming parental identity and justifying resource investment (Boneau et al., 2020; Kroshus, Chrisman, et al., 2017; Kroshus et al., 2018; Kroshus, Garnett, Hawrilenko, et al., 2015; Sarmiento et al., 2010).

Even with SRC knowledge and a safety-first attitude, parents are often uncertain of their role in discussing SRC. As such, many rely on coaches, athletic trainers, or other sporting staff to discuss SRC symptom disclosure with their children (Boneau et al., 2020; Sarmiento et al., 2019). For example, in a study of 334 Florida high school football players, over half reported never having a conversation with a parent or guardian about SRC reporting, even though their parents or guardians signed a consent form acknowledging that they discussed the information with their child (Cournoyer & Tripp, 2014). Based upon this evidence, current efforts to promote conversation about safety and SRC reporting between parents and young athletes are not effective. There is a need to understand the barriers and determinants for parents' conversations about SRC reporting with their adolescent athletes. One framework that would help to optimize the effectiveness of parent-child communication about SRC reporting is the Theory of Planned Behavior (TPB).

Theory of Planned Behavior

The Theory of Planned Behavior (TPB; Ajzen, 1985) is a theoretical framework from which scholars seek to understand and predict various behaviors, including those related to disclosures and health conditions (Godin & Kok, 1996; Jemmott III et al., 2014; LaBelle, 2018; Montano & Kasprzyk, 2008). The TPB operates on the assumption

that individuals behave in a logical manner and engage in a reasoned decision-making process regarding the performance of a variety of behaviors (Ajzen, 1985, 1991; DeBarr, 2004; LaBelle, 2018). This reasoned action is influenced by strategic evaluation of outcomes and beliefs connected to a specific behavior (i.e., behavioral, normative, and control beliefs), which manifest in individuals' *attitudes* (i.e., positive or negative evaluations of a behavior), *subjective norms* (i.e., perceptions of what others think of the behavior), and *perceived behavioral control* (i.e., perceptions about the amount of control one has over performing a behavior) (Ajzen, 1985, 1991; LaBelle, 2018; Montano & Kasprzyk, 2008). These evaluations inform a person's *intention* (i.e., an individual's motivation to perform a behavior) to perform a specified behavior (Ajzen, 1985, 1991), with favorable beliefs and evaluations increasing these intentions (Ajzen, 1985, 1991; LaBelle, 2018; Montano & Kasprzyk, 2008). See Figure 1 for a visual display of the TPB.

The TPB uses the principle of compatibility which requires that attitude, subjective norm, perceived behavioral control, and intention must be set within the same attitudinal and behavioral entities (i.e., context, action, target, and time) to predict changes in behavior (Ajzen, 2006; Ajzen & Fishbein, 1977). Simply, all of the components of the TPB must be measured under the same conditions for results to be reliable. When conducting research using the TPB, behavior must be established within a specified context, including referring to a specific action (i.e., what constitutes performing the behavior), target (i.e., who is supposed to perform the behavior and who is affected by it), and time frame (i.e., when the behavior is to be performed) (Ajzen &

Fishbein, 1977). These entities must remain stable when asking participants to report intention and when observing participants' actual behavior to keep strong correlation for the results (Ajzen & Fishbein, 1977; Montano & Kasprzyk, 2008). This is the strength of the TPB as it can be situated to fit any specific behavior as long as assessment and observation of behavior are both confined within the same corresponding context, action, target, and time (Ajzen, 1991; Ajzen & Fishbein, 1977; Montano & Kasprzyk, 2008). For this thesis, the context is the environment in which parent-child communication occurs, the action considered is communication between parents and adolescent athletes about the importance of reporting SRC symptoms, the target is parents of young athletes, and time is during the immediate future.

Origins and applications of the TPB. The TPB emerged from Icek Ajzen and Martin Fishbein's early social psychology work (Ajzen & Fishbein, 1969, 1970, 1977), which recognized attitude as an indirect predictor of behavior. During this period, given the low correspondence, attitude was argued to be a poor predictor of behavior (Montano & Kasprzyk, 2008). In response, Ajzen and Fishbein created the Theory of Reasoned Action (TRA), which is the predecessor to the TPB. The TRA improved upon extant attitude-behavior research in three ways: it (a) refocused attitude toward behaviors rather than objects (e.g., considering attitudes about quitting smoking [i.e., a behavior] rather than cancer [i.e., an object]), (b) incorporated intention as the immediate determinant of behavior and argued intention is predicted by attitudes, and (c) included social influence (i.e., subjective norm) as another factor predicting intention (Ajzen & Fishbein, 1977; Montano & Kasprzyk, 2008). Therefore, the framework of the TRA utilizes intention,

which is influenced by personal and social influence determinants (i.e., attitude and subjective norms toward a behavior), to predict behavior (Ajzen, 1985, 1991). See Figure 2 for a visual display of TRA.

In order for the TRA to be used effectively, individuals must have full volitional control over performing a specified behavior (Ajzen, 2002; Madden, Ellen, & Ajzen, 1992). As such, the TRA does not accurately predict many behaviors because it fails to account for all of the factors that influence behavioral performance. Specifically, there are internal and external factors which limit one's control over behavioral performance. For the internal factors affecting volitional control, people's perceived autonomy over their actions may influence their perception of control over a specific behavior (Ajzen, 1985). Not all individuals possess the levels of information, skills, abilities, and willpower to successfully accomplish every behavior (Ajzen, 1985). Emotion and compulsion can also have an effect on behavior – even to the point in which people behave in ways opposite to their intentions (Ajzen, 1985). External factors largely refer to the opportunities to perform a behavior. For instance, environments and resources may not allow for the performance of specific behaviors, including the dependence on others who may not be motivated to cooperate (Ajzen, 1985). Consequently, Ajzen extended the TRA with the addition of the concept of perceived behavioral control via the TPB, which addresses behaviors associated with limited volitional control due to internal and external factors (Ajzen, 1985).

Its predictive nature and applicability to nearly any specific behavior has garnered the TPB significant use in numerous contexts, especially those relevant to health

communication (Godin & Kok, 1996; Montano & Kasprzyk, 2008). Health-related uses of the TPB have found support for the theory in consideration of numerous health-risk behaviors: (a) smoking (Otten et al., 2007), (b) cancer screenings (Montaño, Thompson, Taylor, & Mahloch, 1997), (c) condom use (Albarracin, Johnson, Fishbein, & Muellerleile, 2001), (d) speeding (Parker, Manstead, Stradling, Reason, & Baxter, 1992), (e) exercising (Hausenblas, Carron, & Mack, 1997), and (f) diet choices (Sparks, Hedderley, & Shepherd, 1992). The TPB has also been utilized to address parent-child communication about health behaviors and intentions (e.g., sexual behavior, dietary practices, and tobacco use) (Andrews et al., 2010; Hutchinson, Jemmott III, Jemmott, Braverman, & Fong, 2003; Otten et al., 2007). Much of the TPB research considers factors promoting or impeding behavioral achievement and facilitates interventions aimed at behavioral change in select populations (Fishbein, 1990; Fisher, Fisher, & Rye, 1995; Gastil, 2000).

Of special note, the TPB has been applied to the context of SRC to explain athletes' reporting behaviors (Kroshus, Baugh, et al., 2014; Kroshus, Daneshvar, et al., 2014; Register-Mihalik, Linnan, et al., 2013) and coaches and staff's use of concussion management protocols (Newton et al., 2014; Rigby, Vela, Housman, 2013). In general, these efforts have demonstrated the utility of the TPB as a theoretical framework for addressing SRC-related behaviors. For example, TPB studies considering athletes have demonstrated the importance of intentions for determining in-season reporting behaviors (Kroshus, Baugh, Daneshvar, Nowinski, & Cantu, 2015). These studies have also found that intentions toward reporting are shaped by athletes' attitudes toward reporting SRC

symptoms (i.e., informed by a focus on short-term athletic performance outcome) (Kroshus, Baugh, et al., 2014), normative beliefs around reporting (Chrisman et al., 2013; Kroshus, Garnett, Hawrilenko, et al., 2015; Register-Mihalik, Linnan, et al., 2013), and perceived behavioral control (Kroshus, Daneshvar, et al., 2014). In short, athletes who hold negative attitudes perceive social pressures and stigma, or lack knowledge of concussions report lower intentions for reporting concussion symptoms. In contrast, coaches and sporting staff's intentions to utilize concussion management protocols is largely determined by their perceived behavior control for implementing these treatments; when they lack time, resources, or authority, the implementation of new concussion management protocols or purchasing of specific concussion management tools decreases (Newton et al., 2014; Rigby, Vela, Housman, 2013).

Criticism of the TPB. While the TPB has been a foundational framework for many health-related fields, the theory has faced criticism. There are two main areas of critique (a) the TPB's validity and (b) the TPB's usefulness (Sniehotta, Pesseau, & Araujo-Soares, 2014). First, critics have questioned the main components of the TPB for not optimally addressing how behavior change actually works and argue other factors (e.g., behavioral, normative, and control beliefs) do a better job at predicting behavior (Sniehotta et al., 2014). Given TPB focuses on predictors of behavior to give insight toward behavioral change, critics find TPB's description of how behavior realistically changes at the intrapersonal level lacking (Sniehotta et al., 2014). More simply, critics raise the point that individual's cognitions are not properly addressed in the theory and that the current model is oversimplified to the point that it does not show the systematic

evolution of individual's habits and behaviors. However, Ajzen (2015) dismisses these points as based on misinformed understandings of the theory from scholars who have not delved enough into the TPB literature. Ajzen (2015) contends that early work on the TPB/TRA acknowledge the importance of feedback loops and display them in the original model. Feedback loops give insight into cognitions and behavior change because, with them, the theory shows behavior as continuously altering (e.g., if someone performs a behavior due to an intervention, this behavior will affect future behavioral beliefs, attitude, intention, and behavior). Basically, these feedback loops give a more realistic view of how behavior change is not necessarily a linear thought process but rather cyclical in nature, continuously altering.

Additionally, the components of the TPB (e.g., intention) have been criticized for not explaining sufficient variability in behavior. Critics have asserted that the beliefs underlying the TPB model (i.e., behavioral, normative, and control beliefs) are better predictors of actual behavior than intention (Araújo-Soares, Rodrigues, Pesseau, & Sniehotta, 2013; Conner, Gaston, Sheeran, & Germain, 2013). However, Ajzen (2015) contends that the majority of studies using the TPB do not support this notion. Furthermore, Ajzen acknowledges in previous work that multiple factors influence the connection between intention and actual behavior (i.e., time, commitment level, personality differences, and sample size) (Ajzen, 1985, 1991, 2015). However, this problem is further compounded given that numerous moderators (e.g., age and socio-economic status) predict certain behaviors when the TPB predictors (i.e., attitude, subjective norm, perceived behavioral control, and intention) are controlled for (Sniehotta

et al., 2013). Ajzen (2015) opposes these claims as based on poor instrumentation of the predictors of the TPB given that many scholars use scales with a small number of items which inherently do not fully capture constructs.

Second, critics have stated that the TPB is lackluster in terms of providing a useful framework for designing interventions (Sniehotta et al., 2014). This assertion is based on the TPB not being an optimal theory for experimental tests, which limits scholars' capacity to conduct comparative examinations of competing hypotheses (Sniehotta et al., 2014; Sutton, 2002). Ajzen (2015) counters this argument as a problem with researchers and their designs, not the theory. In other words, he argued many social scientists do not allocate sufficient time for formative research to ensure an effective TPB-based intervention. Additionally, Sniehotta et al. (2014) stated that numerous studies indicate that TPB does not provide an acceptable explanation for human behavior, and thus, is outperformed by other theories which provide better insight on human behavior and how to design interventions which alter behavior. Ajzen has acknowledged the rampant use of 'extended' forms of the theory but sustains that most additions are unneeded and do not sufficiently alter the theory to give reason for an edit to the theory's components (Ajzen, 2015). However, Ajzen (2015) does welcome new additions if they have sufficient merit. For the time being, the TPB stands as a foundational and useful theory for health communication scholars. The limitations of the theory have been acknowledged but the strengths of the theory far outweigh its weaknesses.

Extending the TPB to parent-child communication. Parents are notable social referents in an adolescent athlete's life and SRC-related behaviors (Kroshus, Garnett,

Hawrilenko, et al., 2015; Kroshus et al., 2018). Parents influence athletes' sport participation, return-to-play decisions, and healthcare access (i.e., money, insurance, and transportation), which renders them as arguably the most important referent within concussion management protocol (Register-Mihalik et al., 2017). However, parents often do not take a preemptive or active approach in SRC prevention – instead relying on sporting staff (e.g., athletic trainers or coaches) to communicate with their children about SRC reporting (Boneau et al., 2020; Sarmiento et al., 2019). Other parents inhibit the reporting process through excessive amounts of *parental sport pressure*, which refers to the emphasis on the importance of sport participation to athletes (Kroshus et al., 2018). Such pressures de-emphasize the importance of prioritizing one's health. Thus, there is a need for parents to take a more active and beneficial part in concussion management protocol, and the TPB is a useful framework for aiding in this effort.

Each component of the TPB varies in significance for predicting behaviors depending on the context and specific action in question (Montano & Kasprzyk, 2008). Within this thesis, the behavior of interest is parents' communication with their adolescent athletes regarding reporting SRC symptoms to adults, which will be operationalized through parents seeking information on how to accomplish this task (i.e., an indirect indicator of these conversations). This behavior is imperative to study because parents are important social referents for their children's health attitudes and behaviors. Extant research on parent-child communication has demonstrated parent-child conversations have profound influence on shaping adolescents' thoughts and understandings of health issues and behaviors (Fisher, 1986; Hutchinson et al., 2003;

Hutchinson & Wood, 2007; Otten et al., 2007; Santa Maria, Markham, Bluethmann, & Mullen, 2015). Studies have demonstrated that the volume and quality of parent-child communication has been associated with positive outcomes for children's health behaviors, including using birth control (Fisher, 1986), avoiding smoking (Otten et al., 2007), using condoms (Hutchinson et al., 2003; Hutchinson & Wood, 2007), and consuming fruits and vegetables (Andrews et al., 2010). Furthermore, parent-child communication regarding SRC is related to athletes not playing while symptomatic (Kroshus et al., 2019). Therefore, communication between parents and children can have prosocial effects on children's attitudes, well-being, and behaviors. The TPB argues that to better understand parents' communication about SRC symptom reporting, one should consider the influence of parents' attitudes, subjective norms, and perceived behavioral control on their intentions to seek information to facilitate having conversations about SRC reporting with their adolescent athletes. From this theoretical framework, the central determinant of behavior is an individual's intention to engage in said behavior.

Intention. *Intention* is at the heart of TPB and refers to the motivation to perform a behavior (Ajzen, 1991). Intention is the immediate determinant and best predictor of behavior—provided an individual has control over performing a behavior (Ajzen, 1991; Ajzen & Fishbein, 1977; Montano & Kasprzyk, 2008). Four factors affect how effective intention is at predicting behavior (Ajzen, 1985, 1991). First, as the duration between measured intention and enacted behavior increases the predictive accuracy of intention decreases (Ajzen, 1985). Second, the conviction behind the intention is vital to prediction as an intention with low commitment is highly susceptible to change (Ajzen, 1985).

Third, individual differences between people may alter the predictive quality of intention, with those who are sensitivity to external cues (e.g., high self-monitoring individuals) being more likely to recant their intention before an opportunity to perform behaviors (Ajzen, 1985). Lastly, intention is a more stable predictor of behavior with larger samples (Ajzen, 1985). Even with these limitations, intention consistently serves as the best predictor of behavior (Ajzen, 1985, 1991, 2006).

Studies have analyzed intention as the antecedent of numerous health-related behaviors (Albarracin et al., 2001; Fishbein & Yzer, 2003; Godin & Kok, 1996; Hausenblaus et al., 1997; Montano et al., 1997; Montano & Kasprzyk, 2008; Otten et al., 2007; Parker et al., 1992; Sparks et al., 1992), including those directed at parents' communication with children (Fisher, 1986; Huansuriya et al., 2014; Hutchinson et al., 2003; Otten et al., 2007). The TPB research analyzing parent-child communication regarding health issues has primarily focused on sex-related behaviors (e.g., condom use) (Hutchinson et al., 2003; Hutchinson & Wood, 2007; Villarruel et al., 2008). These studies have demonstrated that parents' communicative interventions have had positive effects on adolescents' health-behavior decisions (Fisher, 1986; Hutchinson et al., 2003; Hutchinson & Wood, 2007; Villarruel et al., 2008). Although SRC reporting is quite different than sexual behaviors, the influence of parental communication is theorized to be consistent based upon the assertions of TPB and past parent-child communication literature within health contexts:

H1: Parents' intentions to communicate with their child about reporting SRC symptoms to adults will predict whether they will seek information

about having these conversations.

Although intention is perhaps the most central component of the TPB, it is informed by attitude toward the behavior, subjective norm, and perceived behavioral control (Ajzen, 1985, 1991). The recognition of such relationships allows for better understanding of individuals' concerns and barriers to enacting specific health behaviors. Each of these components of the TPB is reviewed below.

Attitude. The first component of the TPB is an individual's *attitude*, which refers to the amount of positive or negative valence one holds about performing a specific behavior (Ajzen, 1991). For this thesis, parental attitudes will refer to the valence held toward communicating with one's children about the importance of SRC symptom reporting. Attitude is informed by *behavioral beliefs* associated with performing a behavior, such as perceived potential benefits and detriments, as well as the likelihood of such outcomes (Ajzen, 1985, 1991, 2002; Debar, 2004; Montano & Kasprzyk, 2008). Parental attitudes toward communication about health risks is often aligned with behavioral beliefs that address the perceived effectiveness of such communication and the severity of risk being addressed (Huansuriya, Siegel, & Crano, 2014; Santa Maria et al., 2015). For example, Sarmiento et al. (2019) noted that parents who do not communicate to their adolescent athletes about SRC were uncertain about their role in discussing concussion safety and ability to change their child's reporting behavior. The TPB would suggest that the more a parent believes their child is at risk of concussion, the more likely they are to intend to communicate with their child about concussion safety. With this in mind, the following hypothesis is forwarded:

H2: Parents' attitude will predict their intentions to communicate with their child about reporting SRC symptoms to adults.

Subjective norm. The second component of the TPB is *subjective norm*, which refers to the perceived social pressure to perform a given behavior (Ajzen, 1991). Within this thesis, subjective norm will be directed toward parent-child communication about SRC symptom reporting. Subjective norm is informed via *normative beliefs* about what important others think about a specific behavior and one's motivation to comply with their opinions (Ajzen, 1985, 1991; DeBarr, 2004; Montano & Kasprzyk, 2008). The perceived opinions of friends and family – as well as others who may be deemed to be important – are consequential for how one views specific behaviors. The influential referents that come to define subjective norm are typically parents, peers, family, community members, and holistic evaluations of society (Andrews et al., 2010; Godin & Kok, 1996; Huansuriya et al., 2014; Hutchinson & Wood, 2007; Otten et al., 2007; Santa Maria et al., 2015). In the TPB research on health-related behaviors, subjective norm has a diminished influence on behavioral intentions – in comparison to other aspects of the TPB (Godin & Kok, 1996; Hutchinson et al., 2003; Hutchinson & Wood, 2007). However, sport is a context in which social norms are reinforced and the concern for the collective is underscored. For parents, children's sports participation provides community (e.g., social connections to other parents) and a strong source of identity, which hold sway over numerous sport and health-related decisions (Hyman, 2009, 2012). In fact, social concerns around SRC are highly salient for athletes' reporting behaviors (Cranmer & LaBelle, 2018; Sanderson et al., 2017) and parents' decisions around sports

participation (Boneau et al., 2020; Murphy, Askew, & Sumner, 2017). For example, Murphy et al. (2017) found that parents considered the opinions of family members, friends, partners, other parents, and community members when determining whether to allow a child to participate in tackle football. Boneau et al. (2020) noted that even parents who are centrally concerned with their child's health still succumb to community and social pressure to allow their child to play football and ignore the safety risks. Building upon this observed pattern and theorizing, the social pressure from family, other parents, and community members is argued to influence parent-child communication about reporting SRC symptoms:

H3: Parents' subjective norm will predict their intentions to communicate with their child about reporting SRC symptoms to adults.

Perceived behavioral control. The third component of the TPB is *perceived behavioral control*, which refers to an individual's perception of the ease or difficulty of performing a behavior (Ajzen, 1991). For this thesis, parents' perceived behavioral control will be directed toward communicating with their children about reporting SRC symptoms. Behavioral control is composed of *control beliefs*, involving beliefs about external or internal factors which may help or hinder one's ability to perform a behavior (Ajzen, 1991; Montano & Kasprzyk, 2008). Research analyzing control beliefs for parent-child communication about health behaviors and risks has focused on parents' knowledge of the behavior and the relational quality between parents and children (Fisher, 1986; Huansuriya et al., 2014; Santa Maria et al., 2015; Villarruel, Cherry, Cabriaes, Ronis, & Zhou, 2008). Within SRC research, concussion knowledge is a

determinant of parents' communication with their child about concussion safety, with knowledgeable parents engaging in more communication (Kroshus et al., 2018).

Likewise, Sarmiento et al. (2019) found that parents often feel uncertain about communicating with their child about concussions safety because their relationship may be too informal or not focused on sport. Previous parent-child health communication literature and SRC research offer support for the TPB, and indicate control beliefs are integral to parents' intentions to communicate with their child about reporting SRC symptoms to an adult. Therefore, the following hypothesis is forwarded:

H4: Parents' perceived behavioral control will predict their intentions to communicate with their child about reporting SRC symptoms to adults.

The TPB indicates that the aforementioned three components determine the intentions that individuals form toward enacting behaviors (Ajzen, 1985, 1991). Although applications of the TPB to health-related behaviors differ according to context and the behavior in question (Godin & Kok, 1996; Montano & Kasprzyk, 2008), SRC research has found support for these determinants of intention (Kroshus, Garnett, Hawrilenko, et al., 2015; Newton et al., 2014; Register-Mihalik, Linnan, et al., 2013; Rigby, Vela, Housman, 2013). However, the comparative salience of these components in parents' decision-making regarding communication about SRC is unknown. The predictive values of attitude, subjective norm, and perceived behavioral control have varied within SRC research depending on the target and action being addressed (Kroshus, Garnett, Hawrilenko, et al., 2015; Newton et al., 2014; Register-Mihalik, Linnan, et al., 2013; Rigby et al., 2013). For example, perceived behavioral control is the strongest component

influencing sporting staff's use of concussion management protocols (Newton et al., 2014; Rigby et al., 2013), whereas subjective norm is more predictive of athletes' reporting behaviors (Kroshus, Garnett, Hawrilenko, et al., 2015; Register-Mihalik, Linnan, et al., 2013). Sporting staff often have positive attitudes toward concussion management and are trained professionals, but external factors (e.g., time, money, and authority) often limit their ability to implement protocols (Newton et al., 2014; Rigby et al., 2013). On the other hand, athletes are more concerned with the social norms surrounding the reporting of SRC symptoms (e.g., social pressure and stigma) rather than their control over or attitude toward reporting (Cranmer & LaBelle, 2018; Kroshus, Garnett, Hawrilenko, et al., 2015; Register-Mihalik, Linnan, et al., 2013).

Within the TPB research, the comparative predictive value of attitudes, subjective norms, and perceived behavioral control is often sought. Such information is an important first step toward building campaigns and initiatives directed at fostering desirable health behaviors (Fishbein & Yzer, 2003; Santa Maria et al., 2005; Villarruel et al., 2008). This information can provide focus and direction for future research to further understand and address barriers towards parents' intentions to communicate about SRC reporting with their children. Therefore, another goal of this thesis is to determine the relative importance of each component of the TPB for shaping parent-child communication about SRC reporting. Thus, the following research question is forwarded:

RQ1: Which component of the TPB (i.e., attitude, subjective norm, or perceived behavioral control) is most predictive of parents' intentions to communicate with their child about reporting SRC symptoms to adults?

For a summary of the hypotheses one through four and research question one, see the hypothesized model represented via Figure 3.

Parental Approach to Sports Participation. The TPB acknowledges the importance of the context surrounding a specific behavior (Ajzen, 1985, 1991) – an inference that has been confirmed in health-behavior research (Godin & Kok, 1996; Montano & Kasprzyk, 2008). The context relevant to this thesis is the familial environment and their orientations toward sport and athlete health. The varying parental approaches to sport participation may indicate different outcomes associated with intentions and behaviors toward conversations about SRC symptom reporting. In other words, parents who put high amounts of sport pressure on their child or greatly value sport participation may be less inclined to have such conversations.

In reference to the balancing of sport participation and child well-being, Boneau et al. (2020) identified three parental approaches to sport participation: (a) *sport-first*, (b) *safety-first*, and (c) *laissez-faire*. The *sport-first* approach positions sport at the center of a family's identity, emphasizes the benefit of sport participation over the risks, and gives agency of sporting decision to the parents (Boneau et al., 2020). Simply, children's participation in sport is a forgone conclusion and parents make these decisions. Sport-first parents may respond negatively toward communicating with their child about SRC reporting because it emphasizes the risks of sports and may lead to their child missing short term athletic achievement due to self-reporting of SRC symptoms. The *safety-first* approach describes safety and careful deliberation at the center of a family's identity, acknowledgement and rationalization of sports risks, and shared agency between parents

and children regarding sporting decisions (Boneau et al., 2020). In other words, children's participation is negotiated amongst the family and health risks are acknowledged. Parents of this family type may be more inclined and motivated to communicate with their child about reporting SRC symptoms because their child's health is of the utmost priority; arguably promoting a positive attitude regarding SRC symptom reporting. The *laissez-faire* approach involves a nonchalant attitude about sports in which the child's desires are most important. In other words, while these parents may acknowledge some sports-related risks, the child has agency in regards to sports participation decisions (Boneau et al., 2020). Parents of this family type may be less motivated to communicate with their child about reporting SRC symptoms because they may not want to be autocratic or discourage their child from sport participation.

These family types offer potential variation in parent-child communication patterns about SRC symptom reporting. Addressing these family types is relevant to the purpose of this thesis and may help refine understandings regarding how specific subpopulations of parents approach this important topic. Such information would provide a foundation for tailored messages in future interventions. For example, if sports-first and safety-first parents have contrasting notions of risk and take different communicative approaches with their children, they should not be considered as the same target (i.e., set of parents) when using the TPB. This clear delineation between parents with different approaches to sport gives more nuance regarding how subcultures of American families may be dealing with adolescent athletes' reporting of SRC symptoms. Regarding the description of the three parental approaches to sport participation and the explicit

connection to parent-child communication about reporting SRC symptoms, the following research questions are forwarded:

- RQ2: Do parents' intentions to communicate with their child about reporting SRC symptoms to adults differ as a function of their parental approaches to sport participation (i.e., sport-first, safety-first, and laissez-faire)?
- RQ3: Do parents' behaviors of seeking information about communicating with their child about reporting SRC symptoms to adults differ as a function of their parental approaches to sport participation (i.e., sport-first, safety-first, and laissez-faire)?

CHAPTER TWO

METHODS

Participants

Participants were 292 parents/guardians (164 females and 128 males) of juvenile athletes enrolled in 1st-12th grade and competing in an organized sport league. Parents ranged in age from 21-67 years old ($M = 39.68$, $SD = 8.32$), and were primarily Caucasian (80.2%), middle-to-upper class ($M = \$130,405.73$, $SD = \$114,389.00$), and obtained a college degree (80.8%). The children of these participants (202 male and 90 female) played one or multiple of the following sports: soccer ($n = 161$, 54.9%), basketball ($n = 105$, 35.8%), tackle football ($n = 67$, 22.9%), lacrosse ($n = 15$, 5.1%), wrestling ($n = 11$, 3.8%), ice hockey ($n = 9$, 3.1%), and field hockey ($n = 6$, 2%). These families were mostly located in the south ($n = 129$) or west ($n = 73$) of the United States.¹ See table 1 for further details of the participants' demographics.

Procedures

Formal recruitment began following approval from an institutional review board (IRB) and sought participants who were: (a) 18 years of age or older and (b) parents/guardians of young athletes who were currently enrolled in 1st-12th grade and participated in a competitive and organized sports league (e.g., a club or school league) for tackle football, soccer, wrestling, basketball, lacrosse, ice or field hockey. Data

¹ Differences in participant locations were based on the four regional areas (i.e., northeast, midwest, south, and west) used by the United States census. In abbreviated form, the grouping of states for the northeast region included CT, MI, NH, MA, NJ, NY, PA, RI, VT. The Midwest region included IL, IN, IA, KS, MI, MO, MN, NE, ND, OH, SD, WI. The south region included AL, AR, DE, FL, GA, KY, LA, MD, MS, OK, NC, SC, TN, TX, VA, WV. The west region included AK, AZ, CA, CO, HI, ID, MT, NV, NM, OR, UT, WA, WY.

collection took place from November 2019 to February 2020. This period was chosen because of the overlap in the seasons of multiple sports in the United States (e.g., football and soccer as fall sports, and wrestling and basketball as winter sports), which increased the diversity of sports included within the scope of this thesis. The selected sports of football, soccer, wrestling, basketball, ice hockey, field hockey, and lacrosse represent contact sports that are popular across the U.S and have high risks for concussion based on per capita data (Marar et al., 2012).

The size of an ideal sample would be 580 participants, using the 20:1 ratio recommended by Kline (1998) and the number of items within the survey (i.e., 29 items operationalizing the TPB model) (See Appendix A for questionnaire). At a minimum, the sample should consist of 200 participants for path analysis modeling (Jackson, 2003). In an effort to obtain a large sample size, there were two incentives offered for participation. Although a fixed pay compensation system would be best for the intended purpose of this thesis, the first incentive took the form of a lottery drawing for one of four \$25 Walmart gift cards. This incentive procedure, however, can artificially inflate traits associated with risk taking (Hsieh & Kocielnik, 2016), which may have inflated the number of parents who deemphasize their child's well-being or sport-first families. Second, participants were solicited and paid through *Prolific Academic* – a crowdsourcing platform. This platform was chosen over competitors (i.e., Amazon Mechanical Turk and CrowdFlower) due to findings showing that participants in Prolific Academic were more honest and less experienced survey takers and the data quality was higher or comparable (Peer, Brandimarte, Samat, & Acquisti, 2017). However, concerns have been raised over the

reliability and validity of responses gathered through crowdsourcing platforms as the demographics of individuals who use these sites may be skewed and the monetary compensation provided on these sites incentivize quick response completion (Sheehan, 2017).

The researcher solicited participants via three non-probability sampling techniques, which refers to a sampling process that does not give equal chance of being selected to all individuals in the population (Miller & Brewer, 2003). All solicited individuals were provided with an IRB-approved advertisement (See Appendix B). The first technique that the researcher utilized was *purposive sampling*, which involves the researcher specifically recruiting individuals who fit the respondent criteria (Battaglia, 2008). This technique is appropriate when a sample of interest shares a specific set of characteristics (i.e., being the parent of a child in 1st-12th grade, who plays contact sports) (Vogt, 2005). These participants were directly contacted via social media (i.e., Facebook and Instagram) groups associated with being a parent of a child athlete.

The second technique that the researcher utilized was *network sampling*, which involves employing the social networks of informants (e.g., family members, relatives, and friends of the researcher) to find respondents which fit the participant criteria (Lavrakas, 2008). This technique is appropriate when a desired sample is insulated, difficult to recruit, or outside of the networks of a researcher (Lee, 2008). The researcher directly contacted coaches and sports league organizers via email to access their social networks of parents of athletes. Said email included a request to distribute the advertisement, along with the survey link, to parents who meet the current inclusion

criteria.

After the first two sampling techniques failed to yield a large enough sample for analysis, the researcher utilized the third technique of *convenience sampling*, which involves the selection of a sample of participants from a population based on how convenient and readily available that group of participants is (Salkind, 2010). This technique is appropriate when a collection of population members that are accessible, available and willing to participate are found (Etikan, Musa, Alkassim, 2016). These participants were contacted via a crowdsourcing platform (i.e., Prolific Academic), which has an aggregate of survey participants with a variety of demographics and allows researchers to solicit participants who meet a study's sample requirements.

Regardless of sampling technique, all participants were directed to an online survey (i.e., *Qualtrics.com*) through a hyperlink or quick response code (i.e., QR code) featured within the advertisement. Prior to starting the survey, participants were informed of the purpose of the thesis via an IRB-approved consent letter (See Appendix C for consent letter): *to understand the barriers and motivations to parent-child communication regarding sport-related issues*. The explicit use of the term concussion was avoided, as it has become a controversial health issue. The goal of this decision was to reduce the amount of social desirability bias (i.e., whereby parents alter their answers to fulfill social and cultural norms) in parents initial answers. Participants indicated their consent by clicking on a “next” button. After providing consent, participants answered three filter questions to ensure they fit the inclusion criteria: (a) *Are you older than 18 years old?*, (b) *What is your child's current grade level?*, and (c) *Does your child*

currently participate in a competitive and organized sports league for tackle football, soccer, wrestling, basketball, ice hockey, field hockey, or lacrosse? Those who did not meet the inclusion criteria were forwarded to the conclusion of the survey and thanked for their interest in the current research. Provided participants met the inclusion criteria of this thesis, they were granted access to the online survey. Participants with multiple children who fit the inclusion criteria were instructed to answer the survey in regards to their eldest child.

Measures

The survey consisted of items and measures that assessed parents' history of conversations of SRC with their children, aspects of the TPB (i.e., attitude, subjective norms, perceived behavioral control, intention, and behavior), demographics and parental approach to sport participation. Prior to being administered to the participants, the survey was pilot tested on undergraduate students enrolled in a quantitative research class in a social science field. The students were instructed to review and complete the survey as if they were participants, and to provide recommendations for improving the clarity of the introduction, the directions, or the questions within the survey. The pilot procedure resulted in minor revisions meant to increase the clarity of the survey (e.g., changing the list of criteria for participation into bullet point format, editing the questions stems to be more clear and uniform for all items, and altering the font style to bold for "eldest child" to ensure all participants' responses follow the same standards).

The TPB Measures. Since the act of parent-child communication about reporting SRC symptoms has yet to be investigated, the items for the core components of the TPB

(i.e., attitude, subjective norm, perceived behavioral control, and intention) were constructed based on the suggestions offered by Ajzen (2006). Additionally, two health communication scholars – who were unaffiliated with this thesis and had published research on the TPB – reviewed the items and confirmed their consistency with the theoretical framework. Together, following Ajzen’s (2006) recommendations and the use of expert appraisal speak to the subjective validity of the TPB measures.

An original item pool of 29 questions was created to assess parents/guardians’ intentions, attitudes, subjective norms, and perceived behavioral control to discuss with their child the importance of reporting SRC symptoms. However, through confirmatory factor analysis five items were removed due to poor loadings ($\lambda < .5$) (Weber & Patterson, 1996). The retained items for each measure are listed in Appendix A and are described below. The scope of retained items addressing the experiential and instrumental nature of attitudes, injunctive and descriptive norms, and capability and controllability of behaviors demonstrates degrees of content validity (DeVellis, 2012).

Intention. Parents’ *intention* regarding communication about reporting SRC symptoms was operationalized with 4 Likert-type items. The measure included items that involved aspects of discussing SRC reporting with one’s child in the immediate future (e.g., “I intend to talk with my child in the immediate future about reporting concussion symptoms” and “I intend to share what I know about concussion symptoms with my child in the immediate future”). Responses were recorded on a seven-point Likert-type scale that ranged from *strongly disagree* (1) to *strongly agree* (7).

Attitude. Parents’ *attitude* towards communication about SRC reporting was

operationalized with 8 items. Participants were asked to rate their attitude to the provided scenario (i.e., “If I discussed with my child the importance of reporting concussion symptoms to adults, it would be...”). Responses were recorded on a seven point semantic differential scale that included adjective pairs that were instrumental in nature (e.g., ranged from *harmful* [1] to *beneficial* [7]), discussed experiential quality (e.g., ranged from *unenjoyable* [1] to *enjoyable* [7]), and a general scale item to capture overall evaluation (i.e., ranged from *bad* [1] to *good* [7]) (Ajzen, 2006).

Subjective Norm. Parents’ *subjective norm* regarding communication about reporting SRC symptoms was operationalized with 5 Likert-type items. Following Ajzen’s (2006) recommendations, the measure included items that had injunctive quality (e.g., “The people in my life, whose opinions I value, think that I should talk with my child about reporting concussion symptoms.”) as well as captured descriptive norms (e.g., “Other parents talk with their child about reporting concussion symptoms.”). Responses were recorded on a seven-point Likert-type scale that ranged from *strongly disagree* (1) to *strongly agree* (7).

Perceived Behavioral Control. Parents’ *perceived behavioral control* regarding communication about reporting SRC symptoms was operationalized with 7 Likert-type items. The measure included items that captured participants’ capability of performing the behavior (e.g., “If I wanted to I could talk to my child about reporting concussion symptoms.”) as well as the behavior’s controllability (e.g., “I have complete control over talking with my child about reporting concussion symptoms.”) to follow Ajzen’s (2006) recommendations. Responses were recorded on a seven-point Likert-type scale that

ranged from *strongly disagree* (1) to *strongly agree* (7).

Behavior. Parents' *behavior* was assessed via an option to seek further information about communicating with a child about SRC symptom reporting. At the end of the survey, participants had the option to exit the survey or click on the resource link to learn more about engaging in these conversations. Participants decision to click on the resource link was dummy coded (i.e., 0, passing to the end of the survey, or 1, seeking further information). The resource that was linked in the survey was a concussion information sheet designed by the CDC for parents of athletes. The resource discussed what a concussion is, the signs of a concussion, parents' role in concussion management protocol, and the importance communicating with young athletes about concussions and reporting symptoms.

It must be noted that seeking information is an indirect behavioral indicator of actual conversations about SRC reporting. In other words, this behavior is more indicative of such conversations than mere intentions but is not a guarantee that these conversations will occur. This decision to operationalize behavior via information seeking was intentional. Other formats of operationalizing conversations about SRC reporting would not be optimal given the constraints of this thesis (e.g., time and resources). For example, one could solicit parents in a longitudinal study to inquire if they performed the behavior at a later point in time. This approach, however, would be subject to social desirability bias (i.e., parents' would over-report whether they had these conversations; Cournoyer & Tripp, 2014) and declines in response rate (i.e., a common problem in longitudinal research). Another approach may be to solicit the children of

participants and inquire if they have had conversations about SRC reporting with their parents. However, such an approach may not relieve the social desirability bias, as juvenile participants would require a parental consent form – meaning that parents would be aware of the purpose of such data collection and somewhat involved in their child’s ability to participate in this thesis. This reality is further problematic when one considers that the data collection occurred online and the researcher could not ensure that parents were not actively involved or present while their children complete the survey. Additionally, other-report data is still subject to issues that affect accuracy (e.g., memory loss, halo effects, rumination, etc.). With this in mind, this thesis utilized an immediate behavior that is related to parents’ abilities to hold conversations with their children about SRC reporting.

The selection of this particular behavior was an ethical choice as it relays important information that is a prerequisite for actual communication about SRC reporting. Thus, while not directly assessing parents’ communication within their children, the selected behavior provided a useful resource for having these conversations. Moreover, the selection of seeking information as a behavior is important within the TPB framework because behavior is determined by motivation (i.e., intention) and ability (i.e., control) (Ajzen, 1991). By providing the CDC’s concussion information sheet to participants, the researcher is aiding in parents’ ability to contribute to their child’s well-being and safety while participating in contact sports.

Demographics and Parental Approach to Sport Participation. Demographic information included age, sex, race/ethnicity, socioeconomic status, highest level of

education attained, and regional residency. SRC-related demographics were asked about any past SRC diagnoses the parent or their child(ren) has had. Information about the parents' child were asked in regards to the sex of their child, which sports their child plays out of the list (i.e., tackle football, soccer, wrestling, basketball, ice hockey, field hockey, and lacrosse), the percentage of their child's sporting events the parent attends, and their total number of children. Parents were asked for their parental approach to sport participation via three descriptions derived from Boneau et al.'s (2020) parental approach typology (e.g., "My family takes my child's participation in contact sports very seriously. Their involvement in contact sports is concerning and my family's identity is focused on their safety. Making the decision to allow them to play was difficult and included the consideration of the many risks").

Data Analysis

The first step of data analysis centered on culling the data. Four hundred and thirty individuals accessed the survey. Responses with missing data ($n = 78$) were deleted and excluded from the analyses. Responses from participants who did not pass all three attention checks ($n = 60$) were also deleted and excluded from the analyses. In total, 352 of those who accessed the survey completed it fully (81.9%).

The second step of data analysis focused on assessing the soundness of the novel TPB measures. A full measurement CFA of the 29-item four-factor model (i.e., intention, attitude, subjective norm, and perceived behavioral control) was conducted to test the performance of each scale in conjunction with the others (Byrne, 2006). Health communication & SRC researchers' reliance on prior psychometric investigations as

justification for their measures fails to acknowledge dissimilarities between groups with who scales were validated and those in their studies. Model fit for each measure was determined via universal fit indices (Levine, 2005): (a) the normal theory-weighted least squares chi-square, (b) Bentler's (1990) comparative fit index (CFI), (c) Steiger and Lind's (1980) root-mean-square error of approximation (RMSEA), and (d) the standard root-mean-square residual (SRMR). CFIs above .95 and SRMRs and RMSEAs less than .05 were indicative of good model fit; values between .90 and .94 for CFI were marginal, and values between .05 and .08 for SRMR and RMSEA were considered indicative of adequate model fit (Kline, 2011). The results of the initial CFA demonstrated an unacceptable fit; $\chi^2(371) = 1279.59, p < .001, CFI = .84, RMSEA = .09, SRMR = .11$. Subsequent item analysis identified five items with low loadings ($\lambda < .40$) onto their assigned factors. These items were removed. Such practices of item removal are common during the creation of novel scales (DeVellis, 2012). A CFA of the 24-item four-factor model demonstrated an adequate fit; $\chi^2(371) = 681.07, p < .001, CFI = .92, RMSEA = .07, SRMR = .06$.

The third step in data analysis assessed the reliability and convergent validity of measurement, which was determined by Cronbach's α reliability coefficients, composite reliability scores (σ), and average variance extracted (AVE) values. The measurement demonstrated evidence of reliability and convergent validity with all observed values of α and σ exceeding .80 and all observed AVE scores exceeding .50, which indicates each factor captured more variance than error (Hair, Black, Babin, & Anderson, 2010). Discriminant validity was determined with between factor correlations (r) and \sqrt{AVE}

scores. In particular, no unusually high correlations were observed ($r \geq .80$) and $\sqrt{\text{AVE}}$ scores were larger than between factor correlations. In summary, the measurement demonstrated strong degrees of reliability, as well as convergent and discriminant validity. See Table 2 for measurement descriptive statistics.

In the fourth step, with the data cleaned and the quality of the measurement established, the hypotheses and research questions were examined. The hypotheses and first research question were considered via a Structural Equation Model (SEM) (See Figure 4). The fit indices for the SEM were the same used for the confirmatory factor analyses and the same standards of fit were applied.

The second research question was examined via a One-Way Analysis of Variance (ANOVA). Within this analysis, parental approach to sport participation served as the independent variable and consisted of three categories (i.e., sport-first, health-first, and laissez-faire), where parents' intentions to communicate with their child about reporting SRC symptoms to an adult served as the dependent variable. The assumption of homogeneity of variance was examined with a Levene's test and a significance level above .05 was sought. Additionally, the size of the three groups required at least 40 members per group and should have been roughly comparable (Field, 2009). The researcher considered the omnibus F test and p value (at 95% confidence level) to determine if parents' intentions to communicate with their children about reporting SRC symptoms differed as a function of parental approaches to sport participation.

The third research question was examined via a $3 \times 2 \chi^2$ analysis to determine if parental approaches to sport participation were associated with the behavior of seeking

SRC information. Parental approaches to sport participation consisted of three groups: (a) sport-first, (b) health-first, and (c) laissez faire. The behavior of seeking SRC information consisted of two groups: (a) those who sought information by clicking on the provided URL and (b) those who did not seek this information. The researcher considered the χ^2 statistic and p value (at 95% confidence level) to determine if parental approaches to sport participation and the information seeking behavior were related. Cramer's V was utilized to determine the strength of association between these variables of interest.

CHAPTER THREE

RESULTS

The four hypotheses of this thesis predicted that parents' (1) intention to communicate with their child about reporting SRC symptoms to adults would predict whether they seek information about having SRC-related conversations, and their (2) attitude, (3) subjective norm, and (4) perceived behavioral control would predict their intention to communicate with their child about reporting SRC symptoms to adults. The first research question asked which component of the TPB (i.e., attitude, subjective norm, or perceived behavioral) is most predictive of parents' intentions to communicate with their child about reporting SRC symptoms to adults. To test these hypotheses and research question, a structural equation model was conducted with the three predictor variables of the TPB Model (i.e., attitudes, subjective norms, and behavioral control) influencing the outcome of behavior (i.e., seeking information about having SRC-related conversations) through intention. Results of the structural equation model provide evidence that the model had acceptable fit to the data, $\chi^2(371) = 681.07, p < .001$, CFI = .92, RMSEA = .07, SRMR = .06. See Figure 4 for the statistical model.

In support of hypothesis one, intention ($\beta = .15, p < .05$) was a positive predictor of whether parents sought information for having SRC-related conversations with their children. Therefore, as parents' intention increased so too did their information seeking behavior. Hypothesis two and three were also supported; attitude ($\beta = .35, p < .000$) and subjective norm ($\beta = .30, p < .000$) were positive predictors of parents' intent to communicate with their child about reporting SRC symptoms to adults. Specifically, as

parents' attitude and subjective norm toward having a discussion became more positive, their intention to communicate increased. However, hypothesis 4 was not supported as perceived behavioral control ($\beta = .10, p = .11$) was not a significant predictor of parents' intent to communicate with their child about reporting SRC symptoms to adults. See Figure 4 for the standardized regression weight for each path in the model.

In regards to research question one, given the potential limitations of using Beta weights to demonstrate the strength of predictors that share variance (Nathans, Oswald, & Nimon, 2012), a series of hierarchical regressions were conducted. In each analysis, the unique variance attributable to attitudes and norms were identified within block 2, while controlling for the other variable within block 1. Through this process, it was revealed that attitudes ($\Delta F(1, 289) = 44.23, \Delta R^2 = .11, p < .001, \beta = .35. t = 6.65$) accounted for more unique variance within intention than social norms ($\Delta F(1, 289) = 35.37, \Delta R^2 = .09, p < .001, \beta = .31. t = 5.95$) – although both significantly improved the model.

Research question two explored the effects of different parental approaches to sport participation (i.e., sport-first, safety-first, and laissez-faire) on parents' intention to communicate with their child about reporting SRC symptoms to adults. A One-Way ANOVA was performed to assess differences between groups. The Omnibus F was not significant, $F = 2.83 (2, 289), p = .061$ indicating that there are no significant differences between the groups. Parents' did not differ in their intention to communicate with their children about reporting SRC symptoms to adults based on their parental approach to sport participation.

The third research question examined the effects of parental approaches to sport

participation (i.e., sport-first [$n = 130$], safety-first [$n = 48$], and laissez-faire [$n = 114$]) on parents' behavior of seeking information in regards to communicating with their child about reporting SRC symptoms to adults. A 3x2 chi-square test indicated a non-significant relationship between parental approaches and the information seeking behavior, $\chi^2 (2) = 1.27, p = .53, V = .07$. Parents' did not differ in their information seeking behavior to aide these conversations based on their parental approach to sport participation.

CHAPTER FOUR

DISCUSSION

This thesis sought to understand the motivations and barriers to parent-child communication regarding reporting SRC symptoms to adults through the framework of the Theory of Planned Behavior (TPB). The TPB asserts that attitude, subjective norm, and perceived behavioral control predict intentions, which in turn predicts behavior (Ajzen, 1985). The results of this investigation provide support for using the TPB to investigate parents' perceptions of this behavior. Parents' intention was a significant predictor of their information seeking behavior to aide having these conversations. Attitudes and subjective norms were significant predictors of parents' intentions to communicate with their child about reporting SRC symptoms to adults; however, their perceived behavioral control in doing so was not. Also, this thesis had secondary objectives to examine whether parental approach to sport participation was a predictor of parents' intention to have these conversations, as well as their information seeking behavior. The findings of this thesis failed to reveal any such significant differences. In the following section, the results are considered within the context of extant SRC and TPB research.

Regarding hypothesis one, parents' intentions to communicate with their child about reporting SRC symptoms to adults predicted whether they sought information about having SRC-related conversations. This finding follows extant TPB research in health and sport fields. Formative research on the TPB has established intention as the best predictor of behavior (Ajzen, 1991; Ajzen & Fishbein, 1977). This has been

replicated in numerous health-related studies (Albarracin et al., 2001; Fishbein & Yzer, 2003; Godin & Kok, 1996; Hausenblaus et al., 1997; Montano et al., 1997; Montano & Kasprzyk, 2008; Otten et al., 2007; Parker et al., 1992; Sparks et al., 1992). Furthermore, parents' intention to communicate with their children about their health behavior was predictive of these conversations (Fisher, 1986; Huansuriya et al., 2014; Hutchinson et al., 2003; Otten et al., 2007). Within sport research, athletes' intention to report SRC symptoms has been predictive of their reporting behavior (Kroshus, Baugh, Daneshvar, Nowinski, et al., 2015; Register-Mihalik, Linnan, et al. 2013). Additionally, coaches' and athletic trainers intention to use new concussion management guidelines is predictive of them actually using the guidelines (Newton et al., 2013; Rigby et al., 2013). Given that intention equates to motivation, there is logical reasoning within the TPB for intention's connection to behavioral performance because the only restriction stopping behavior is control (Ajzen, 1991). The other finding of perceived behavioral control not being predictive of intention may illuminate why parents' intention to communicate with their child about SRC reporting would be predictive of direct information seeking behavior to aide these conversations. If parents' feel capable and in control of whether they have these conversations or not then the only barrier from these conversations would be the strength of their current motivation. The result of hypothesis one and four follow this same thought pattern as control does not seem to be a component significantly affecting parents' behavior and therefore attitude and subjective norm driving intention seem to be the most important components of the TPB in this context. Therefore, motivation to have a conversation with their child increases behavioral performance of this task.

While intention was a significant determinant of behavior, the strength of the relationship was notably weak ($\beta = .10$). There are two potential explanations for this relationship. First, the operationalization of behavior within this thesis was not a direct measurement of parent-child communication regarding SRC reporting. An indirect measurement was chosen to fit the constraints of the thesis (i.e., time and resources), increase the efficiency and accuracy of data collection and participants' responses (e.g., social desirability bias, decline in response rate, memory loss, etc.), as well as provide a resource which would aide parents' in engaging in these conversations. This decision provided an immediate behavior to measure, which reduced the effect of elapsed time on participants' intention and behavioral performance (Ajzen, 1985). However, foundational work on the TPB describes the need keep the elements of the behavior (i.e., target, act, context, and time) compatible for all constructs within the framework (Ajzen, 1991, 2006; Ajzen & Fishbein, 1977). Therefore, the behavior in question for parents' intention differing from the measured behavior may hold responsibility for the weak relationship between intention and behavior. Second, the majority of the respondents were paid participants ($n = 234$), which may have contributed to the low number of participants who did seek information (i.e., $n = 49$). Participants from crowdsourcing platforms, such as Prolific Academic, fill out surveys purposefully for financial compensation and do not receive payment until after they complete the survey. They have incentive to fill out as many surveys as quickly as possible. Therefore, there is a reasonable explanation for participants to decline an invitation to visit an additional website (i.e., the current thesis' measurement of behavior), as opposed to concluding the survey.

Next, in terms of the predictors of intention, attitude and subjective norms were significant predictors while perceived behavioral control was not. The TPB is a context driven theoretical framework and the strength of its components is acknowledged to be dependent on the target, action, context, and time under investigation (Ajzen & Fishbein, 1977; Montano & Kasprzyk, 2008). This thesis shows that parent-child communication regarding SRC reporting is seemingly driven by attitude and subjective norm. In regards to hypothesis two and research question one, parents' attitudes toward communicating with their child about reporting SRC symptoms to adults was the most significant predictor of intention to do so. In other words, how parents perceive the outcomes of having a conversation about SRC reporting (e.g., their child reporting their next SRC symptom to an adult) is the greatest determinant of parents initiating these conversations. The strength of the relationship between attitude and intention parallels SRC research on sport identity. Children's athletic achievements provide parents with a strong source of identity and justification for resource investment (Boneau et al., 2020; Hyman, 2009, 2012; Kroshus et al., 2018; Kroshus, Garnett, Hawrilenko, et al., 2015). Parents who have strong sport-identities put more sport-related pressure on their children, view the risk of SRC for their child less than other parents, and have less communication with their children about SRC reporting (Boneau et al., 2020; Kroshus et al., 2018). A similar effect is observed among athletes who when highly identified have lower perceptions of risk for SRC and greater dedication to sport even when injury is involved (Kroshus et al., 2018). Therefore, a parent who views their child's risk of SRC as low may not deem a conversation as necessary or valuable. Likewise, parents who put high amounts of sport-

related pressure on their children may not have positive feelings toward having SRC-related conversations, as they want to focus on athletic performance and achievement.

For hypothesis three, parents' subjective norms were also significant predictors of intentions to have a SRC-related conversation with their children. More simply, parents valued what important others (e.g., spouses, family members, friends, and other parents) thought about the behavior and mirrored their intentions to match their perceptions of others. While multiple health-related studies, including meta-analyses, have found subjective norm to be the least predictive component of the TPB model (e.g., Godin & Kok, 1996; McDermott et al., 2015), SRC is a context which is highly influenced by social pressure. For example, research on athletes' SRC reporting has shown social norms and pressure are prominent drivers of intention to report (e.g., Cranmer & LaBelle, 2018; Register-Mihalik, Linnan, et al., 2013; Sanderson et al., 2017). Athletes may not report SRC symptoms for fear of hurting team performance, letting others down, or not living up to normative cultural views (Kerr et al., 2016; Sanderson et al., 2017). This may be due to influential individuals and the media reinforcing the pain principle (i.e., pain is necessary for character development) as a normal aspect of sport participation and exerting social pressure placed on athletes to play through an injury (Kroshus, Garnett, Hawrilenko, et al., 2015; Sanderson et al., 2016, 2017). When considering the context of the sport community, parents have social ties to their children's athletic career and achievements. As Hyman (2009) describes "for adults, youth sports can become something of a social register. When a child is named to an elite travel team there can be an unmistakable boost to an entire family's social standing" (p. 22). If a young athlete is

removed from play for a season due to concerns of SRC, their parents may lose said social standing during the time it takes the child to recover from the head injury.

Therefore, parents are incentivized to not discuss SRC reporting with their child because symptom reporting will most certainly result in loss of playing time and possibly social standing. Parents may look toward the beliefs and actions of other community members and parents to judge if discussing SRC reporting with their child is worth the possible loss of social standing. Alternatively, if a parent's close relatives, spouse, and friends have positive actions and beliefs toward having these discussions than the parent has nothing to lose in regards to their social standing.

In regards to hypothesis four, the confidence parents perceived in their own ability and control over conducting conversations with their children about SRC reporting has no association with their intention to do so. While contrary to seminal theorizing, the lack of support for perceived behavioral control affecting parents' intentions is consistent with some health communication research and SRC. While knowledge is delineated as an internal factor effecting perceived behavioral control (Ajzen, 2002), LaBelle (2018) – who conducted a similar study on college students' intention to intervene on behalf of a friend who was engaging in nonmedical use of prescription stimulants (i.e., one focused on communication about another's health behaviors) – also failed to find a significant relationship with intention. There are two potential explanations for this finding. First, the multivariate nature of the SEM may explain the lack of an observed significant relationship. In other words, it is not that perceived behavioral control is unassociated with intention on a bivariate level (i.e., indeed it was $r = .27, p < .001$) but that it fails to

account for significant amounts of unique variance when other predictors (i.e., attitude and social norm) are considered (See Figure 4). More simply, other variables may better account for intentions to discuss SRC. For example, Cranmer and LaBelle (2018) failed to identify significant associations between concussion knowledge and intentions to discuss symptoms when other factors were considered (e.g., stigma). Likewise, Kroshus et al. (2018) argued that perceived risk is more predictive of intentions than parents' knowledge of concussion symptoms. Such an argument underscores the notion that treating SRC is as much of a communicative and social issue, as it is an educational or medical one (Cranmer & LaBelle, 2018). Second, the creation of a novel measure may also be accountable, as the perceived behavioral control measure created for this thesis produced little variance (i.e., a mean of 6.44 and standard deviation of .66 on a 7-point scale). Specifically, participants were extremely confident in their abilities to have competent conversations with their children about SRC symptom reporting; perhaps to the extent of over estimating what they know about concussions and their abilities to competently communicate. This finding may also be indicative of participants' perceived control not aligning with their actual control over having these conversations. The predictive ability of perceived control is dependent on how accurately one perceives their actual ability to perform a behavior (i.e., actual control) (Ajzen, 2002). Therefore, further observations of parent-child communication about SRC reporting are needed to ensure parents' anticipated control is realistic. This aspect of the sample may also explain why few participants sought additional information about concussions; they did not feel it was needed. Future research may consider addressing the disparity between parental SRC

conversations as documented in previous research (Kroshus et al., 2018, 2019) and parents' concussion knowledge.

In regards to the secondary objectives of this thesis, both research question two and three regarding parental approach to sport participation predicting intentions (i.e., RQ2) and information seeking behavior (i.e., RQ3) were insignificant. Parents did not differ in their intention to communicate with their children about reporting SRC symptoms to adults or in their information seeking behaviors. Previous research on parents' beliefs regarding contact sport participation have centered on the perception of risk of SRC and CTE (McGlynn, Boneau, & Richardson, 2010; Murphy et al., 2017). Perception of risk seems to be the guiding measure of whether parents push for contact sport involvement (McGlynn et al., 2010; Murphy et al., 2017). The parental approach to sport participation provides a structure to evaluate whether a parent is more or less health oriented in terms of their child's sport participation (Boneau et al., 2020). This served as the reasoning for exploring how parental approach to sport participation would relate to parent-child communication about SRC reporting given that SRC and CTE risk is a related topic within contact sport participation.

There are numerous potential explanations for the insignificant findings. First, the parental approach typology was derived from an interview-based study with married couples in Texas about their child's participation in youth tackle football (Boneau et al., 2020). This typology has yet to be empirically validated in a broader population. Therefore, the typology may only be justified within the specific context of youth football participation in Texas or simply not generalizable to the context of parent-child

communication about SRC reporting. Second, the nature of the sample may account for these insignificant findings. In regards to research question three, a sizeable portion of the sample ($n = 234$) were paid participants, who were equally incentivized to finish surveys as quickly as possible. This desire may have diminished potential differences between parental approaches in information seeking; decreasing the variance in this behavior. Coupled with disparate group sizes (i.e., sports-first [$n = 130$], laissez-faire [$n = 114$], and safety-first [$n=48$]), the insignificant findings may merely be a result of the problematic data used for the analysis.

Implications

This thesis has theoretical, heuristic, and practical implications. There are three theoretical implications that are noteworthy. First, this thesis extends the utility of the TPB to an under researched and important context (i.e., parent child communication about SRC reporting). Given the TPB is acknowledged as a context-driven based theory where the strength of its components differ based on the behavior (Ajzen & Fishbein, 1977), the findings of this thesis promote the continued use of the theory for future health and sport research. Second, the aforementioned findings demonstrate that TPB research can be contextualized to communicative behavior where the goal of the communicative event is directed toward altering the behavior of a secondary target. LaBelle (2018) utilized the TPB in a similar fashion for communication surrounding non-prescription drug use of a secondary target and found perceived behavioral control to not be significant as well. Such extensions capitalize on the nature of social networks by identifying relationships and specific interactions as a mechanism of health innovation.

Third, this thesis utilized both intention and behavior to encompass the TPB in its entirety while previous health communication studies (e.g., LaBelle, 2018) and SRC research (e.g., Kroshus, Baugh, Daneshvar, Nowinski, et al., 2015) have stopped at intention. The use of the full model goes in line with the original intention of the theory (Ajzen, 1999) so as to not assume intention leads to behavioral change without empirical data to support the claim. Also, the use of the base model of the TPB without any additions supports Sniehotta's (2014) call to not use extended versions of the theory as it does a disservice to the theory for it to not stand on its own.

While SRC has been researched extensively within the domains of sports medicine and athletic training, this thesis answers previous calls for research that analyzes the communicative issues with SRC reporting (Cranmer & LaBelle, 2018; Sanderson et al., 2017). Specifically, this thesis answers Kroshus et al. (2019) call to further investigate parents' verbal communication about concussion. Previous studies have primarily focused on athletes' perceptions of SRC reporting (e.g., Kroshus, Baugh, et al., 2014; Kroshus, Baugh, Daneshvar, Nowinski, et al., 2015; Register-Mihalik, Linnan, et al., 2013) and have failed to address other influential figures within concussion management who increase the amount of symptom reporting. Parents have previously been identified as under-investigated referents who possibly affect athletes' reporting behavior (Kroshus et al., 2018). This thesis identifies the antecedents of parent-child communication about SRC, which is an important first step toward cultivating social conditions that maximize parental influence. Such an effort is warranted given Kroshus et

al. (2019) found parent-child communication about SRC increases athletes' reporting behaviors.

Given the results of this thesis, future health campaigns should be directed toward changing parents' attitude and subjective norm toward communicating with their children about SRC reporting. First, to change parents' attitude toward this behavior, campaigns should highlight how enjoyable and how useful parent-child communication about SRC reporting is. Some parents may already have good relationships and communication with their child and signaling to them that a discussion about SRC reporting would be no different from other topics may make parents feel more comfortable about the act. Alternatively, parents with strained bonds with their children could be reassured that the communicative act may build a greater bond with their child as it signals to them that their mother, father, or guardian cares about their wellbeing and safety. Furthermore, communication about SRC reporting could lead to more communication about sport topics (e.g., how is the season going and aspirations to participate in college athletics) or other health behaviors (e.g., healthy eating). Additionally, the effectiveness of the conversation must be addressed. For example, research shows that young athletes are influenced by social pressure when deciding to report SRC (Cranmer & LaBelle, 2018) and presenting this information to parents as well as stating that parents can be a positive social influence on their children in this regards may sway parents' attitude toward this behavior. Essentially, a campaign showcasing how parent-child communication led to greater bonds between parents and children as well as the child actually reporting their next SRC symptom would be the most persuasive to parents. The latter part would be

easy to persuade parents on given that research already supports this claim (Kroshus et al., 2019). This falls in line with Ajzen's (1985) original aim of attitude being formed by beliefs about the outcomes of behaviors. Simply put, showing parents all the benefits of communicating with their child about SRC reporting will lead to parents changing their attitude toward having these conversations.

Second, campaigns should also address parents' subjective norms about having these conversations. The focus on this aspect of a campaign would be to highlight how important others (e.g., family members) approve of the behavior and would actually perform the act themselves as well. This could appear with advertisements which showcase that most parents talk to their children about SRC reporting and it is a normal act within the youth and adolescent sport community. Furthermore, emphasis should be placed on how it is parents' social responsibility to talk to their child about SRC reporting. Sarmiento et al. (2019) shows that parents feel it is not up to them to have these conversations and that they leave it up to coaches and athletic trainers. However, this narrative could be countered with an educational campaign. By addressing other parents, significant others, family members, friends, and community members in campaign advertisements, parents will think more positively toward these conversations because they believe it is a normal thing to do and those individuals want would want them to do it. Given that perceived behavioral control was not found to be significant, this thesis shows that focusing on parents' capabilities and control over having these conversations would not be as advantageous as focusing on parents' attitudes and subjective norms. This information is greatly beneficial to health and sport practitioners

because previous efforts by the CDC have focused on educating individuals on concussion symptomology while not sufficiently targeting other reasoning for behavioral change (Sarmiento et al. 2010, 2014).

Limitations

The current thesis has multiple limitations that must be addressed. First, the design of the behavior measurement is not compatible, which may have affected the results for hypothesis one and research question three. As previously discussed, the instrumentation of this measurement was deemed a credible decision based on the constraints of this thesis and the ethical resource it provided. The use of the TPB model normally suggests which component of intention (i.e., attitude, subjective norm, and perceived behavioral control) indirectly influences behavior through intention. However, the incompatibility of context, act, target, and time within the operationalization of the components of the TPB does raise concern if the intention would be predictive of the direct behavior in question (Ajzen, 1991, 2006; Ajzen & Fishbein, 1977). This limitation paired with the following one further explain the concerns over hypothesis one as well as research question two and three.

Second, the use of paid participants may raise concern over the quality of data given that they are incentivized to finish surveys as quickly as possible to obtain further compensation sooner. Multiple attention checks spread throughout the survey were created to address this problem. Also, Peer et al. (2017) found that participants from Prolific Academic were less dishonest than participants from more popular crowdsourcing platforms (e.g., Amazon's Mechanical Turk), which gave reasoning for

this platform's use in the current thesis. Even with these points, there is some credence to response quality being less than desired due to participants being financially motivated to complete the survey, especially regarding the behavior of seeking information about SRC conversations.

Third, there were multiple limitations due to the demographics of the participants who completed the survey. Participants were racially homogenous, primarily male, highly educated, and include few individuals with safety-first parental approaches. Given that most participants were Caucasian (80.2%), there are concerns over how representative this sample is. Racial and ethnic demographics have varied cultural influences which may affect how parents view their children's health and sport participation (Flores, Olson, & Tomany-Korman, 2005; Shakib & Veliz, 2013). Next, the sex of the parents' children which they responded to the survey in regards to was primarily male (69.2%) which may have influenced responses given the different gender expectations of males and females in sport (Eccles & Harold, 1991). Lastly, the lack of comparable group sizes between the parental approaches to sport participation is problematic for the findings. Given the group sizes were not optimal for the tests used in this thesis, there is still questions regarding whether these groups would differ or not if the group sizes were comparable. Therefore, further investigation must occur to provide conclusive findings on parental approaches to sport participation in regards to parent-child communication about SRC reporting.

Future Research Directions

Future studies should address the limitations of this thesis, expand on the TPB model within the context of parent-child communication in regards to SRC reporting, and further investigate parental approach to sport participation. In particular, a longitudinal study should be undertaken with multiple stages to further investigate the reasoning for parent-child communication about SRC reporting. This would allow researchers to implement a pilot study to investigate the beliefs affecting attitude and subjective norms and follow up with a main study which confirms those beliefs and components determining intention with another sample. Then, a second data collection of those same participants could be performed to examine if those actual conversations took place. Ajzen (2006) recommends this design to properly assess the measurements and record behavioral performance. Also, different contact sports should be separately examined to properly understand the motivations and barriers for parents from having these conversations. Each sport has participants and a fan base who view the contact level and risk of SRC for their sport differently. For example, tackle football is known for its collisions while basketball may not be understood within the American public as a sport where SRC commonly occurs. Furthermore, parents of children in multiple sports must be examined separately to understand if the variety or amount of sports has an effect on parents' knowledge and perception of risk of SRC for their child. A more representative sample of the population in question should also be sought after in future research to have a data set which would be more credible for generalization as ethnic, gender, and cultural backgrounds influence people's perceptions of health outcomes.

Additionally, more extensive use of the TPB model should occur for the context of parent-child communication regarding SRC reporting. While this thesis does illuminate that this behavior is driven from attitude and subjective norm, future research that investigates the beliefs that inform these components would be beneficial to health and sport practitioners. Past research has shown that perception of SRC risk does influence parents' communication behaviors with their children (Kroshus et al., 2018; Sarmiento et al., 2019) which may be informing parents' attitude toward having these conversations. Also, parents are influenced by the opinions of family members, friends, partners, other parents, and community members when deciding on tackle football participation (Boneau et al., 2020; Murphy et al., 2017) which may relate to these same influencers informing parents' subjective norm in regards to having conversations about SRC with their children. Also, further investigation is required of the parental approaches of sport participation as this typology has not been previously empirically supported and is from an interview based study (Boneau et al., 2020). Beyond assessing this typology within the context of parent-child communication about SRC reporting, simply analyzing this study with a quantitative methodology and formulating a valid instrument would be invaluable for the generalization of the approaches. Lastly, while this thesis forwards parents' influence on their children as a practical avenue to increase SRC reporting, future research should investigate children's influence on their parents' beliefs toward SRC and reporting symptoms. Given that children have been found to influence parents' views on sport participation (Jambor, 1999), there is reasoning that children may change their parents' opinions toward SRC reporting. This may be an advantageous avenue to

examine since SRC prevention requires a multifactorial approach (i.e., including intrapersonal, interpersonal, community, societal and policy changes) (Register-Mihalik et al., 2017) and parents may be more equipped to address some of these factors. Therefore, this possible upward education may be fruitful for scholars to investigate along with parent-child communication about SRC reporting

CHAPTER FIVE

CONCLUSION

The current thesis demonstrated that parent-child communication regarding SRC reporting is determined by parents' attitude and subjective norm toward this communicative event. SRC reporting is the most crucial step toward preventing significant long-term health problems for young athletes (Kutcher & Eckner, 2010; McCrea et al., 2013; McKee et al., 2009). However, previous research indicates that athletes often do not report such symptoms, in part because of social concerns and a lack of support (Cranmer & LaBelle, 2018; Sanderson et al., 2017). Through the cultivation of quality relationships that are supportive of responsible SRC behaviors, it is theorized that scholars may better address this problematic reality (Kroshus et al., 2018, 2019). The current thesis argues parents are an important social referent and understanding their communication about SRC reporting is a crucial first step to harnessing their potential influence. With the health of millions of adolescent athletes at stake, scholars and practitioners must continue to learn about the social conditions surrounding SRC and seek to promote the conditions needed to address this public health crisis; Such efforts will require the investment of parents and guardians.

CHAPTER SIX

TABLES

Table 1

Participants' Demographics.

Variable	<i>N</i>	<i>%</i>
1. Age (years)	<i>M</i> = 39.72	<i>SD</i> = 8.31
2. Sex of Parent		
Female	164	56.2%
Male	128	43.8%
3. Race		
White	234	80.1%
Black	21	7.2%
Hispanic/Latin(o/a)	21	7.2%
Asian	8	2.7%
Other	8	2.7%
4. Region		
South	129	44.2%
West	73	25%
Midwest	47	16.1%
Northeast	43	14.7%
5. Education		
4-year Degree	125	42.8%
Graduate Degree	80	27.4%
Some College	34	11.6%
2-year Degree	31	10.6%
High School Diploma/GED	19	6.5%
Some High School	3	1.0%
6. Income	<i>M</i> = 130556.5	<i>SD</i> = 114389.0
7. Attendance of Sporting Events	<i>M</i> = 87.23	<i>SD</i> = 17.79
8. Sex of Child		
Male	202	69.2%
Female	90	30.8%
9. Grade Level		
10 th Grade	34	11.6%
1 st Grade	31	10.6%
12 th Grade	25	8.6%
8 th Grade	25	8.6%
11 th Grade	24	8.2%
5 th Grade	24	8.2%
4 th Grade	24	8.2%
9 th Grade	23	7.9%
7 th Grade	23	7.9%
6 th Grade	23	7.9%
3 rd Grade	19	6.5%
2 nd Grade	17	5.8%

Participants' Demographics Continued

Variable	<i>N</i>	%
10. Sports		
Soccer	114	39.0%
Multiple	73	25.0%
Two Sports	68	9.6%
Soccer & Basketball	32	
Football & Basketball	16	
Football & Soccer	7	
Football & Wrestling	4	
Field Hockey & Lacrosse	2	
Basketball & Lacrosse	2	
Soccer & Field Hockey	1	
Football & Lacrosse	1	
Soccer & Wrestling	1	
Football & Ice hockey	1	
Soccer & Lacrosse	1	
Three Sports	3	1%
Football, Soccer, & Basketball	2	
Football, Soccer, & Wrestling	1	
Four Sports	1	0.3%
Football, Soccer, Basketball, & Ice Hockey		
Five Sports	1	0.3%
Football, Soccer, Basketball, Ice & Field Hockey		
Basketball	52	17.8%
Football	31	10.6%
Lacrosse	9	3.1%
Ice Hockey	6	2.1%
Wrestling	5	1.7%
Field Hockey	2	0.7%
11. Leagues		
School	113	38.7%
Recreational	80	27.4%
Multiple	59	20.2%
Club	40	13.7%
12. Total Number of Children	<i>M</i> = 2.34	<i>SD</i> = 1.16
13. Previous SRC for their Child(ren)		
No	272	93.2%
Yes	20	6.8%
14. Previous SRC for Parent		
No	251	86.0%
Yes	41	14.0%

Note. (*N* = 292)

Table 2*Descriptive Statistics and Correlations*

Factors	<i>M</i>	<i>SD</i>	α	σ	AVE	1	2	3	4
<i>Intention</i>	6.03	1.11	.93	.92	.73	(.86)			
<i>Attitude</i>	6.40	.83	.94	.93	.64	.45***	(.80)		
<i>Subjective norm</i>	5.16	1.25	.88	.90	.64	.42***	.32***	(.80)	
<i>Perceived Behavioral Control</i>	6.44	.66	.85	.89	.53	.24***	.38***	.10	(.73)

Note. \sqrt{AVE} is presented in the parentheses. *** $p < .001$. ** $p < .01$. * $p < .05$.

CHAPTER SEVEN

FIGURES

Figure 1

Visual display of the Theory of Planned Behavior.

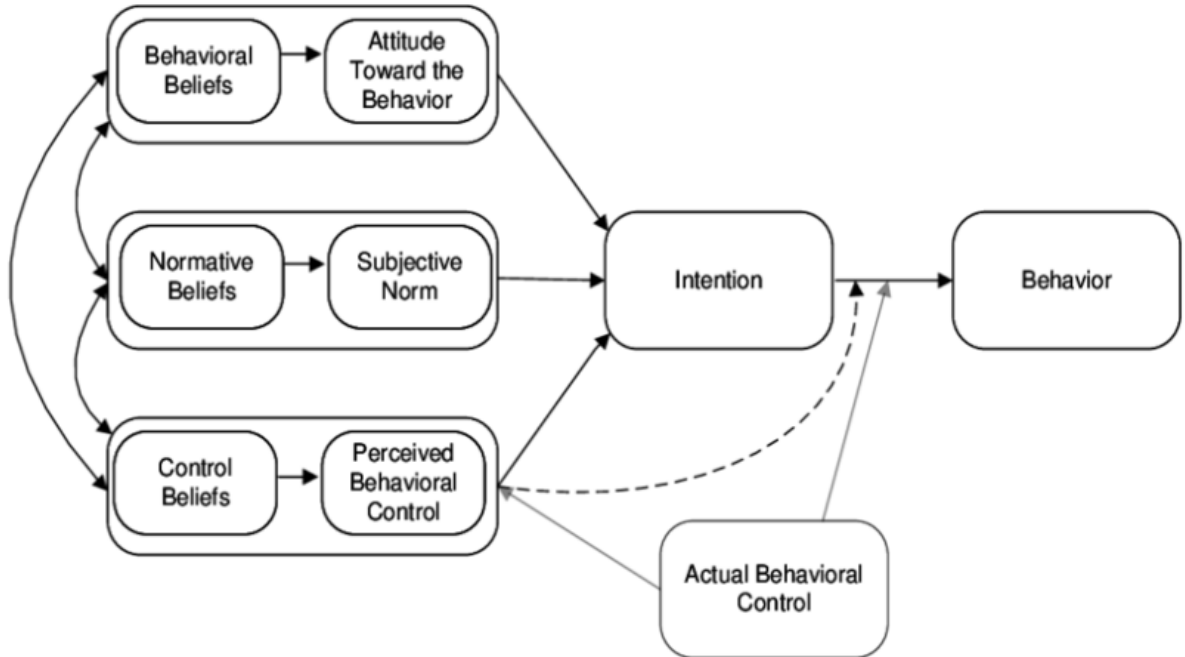


Figure 2

Visual display of the Theory of Reasoned Action.

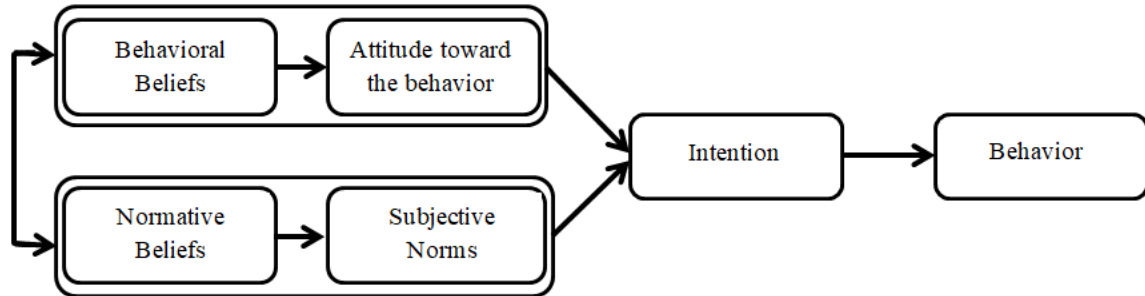


Figure 3

Proposed model of hypotheses and research question.

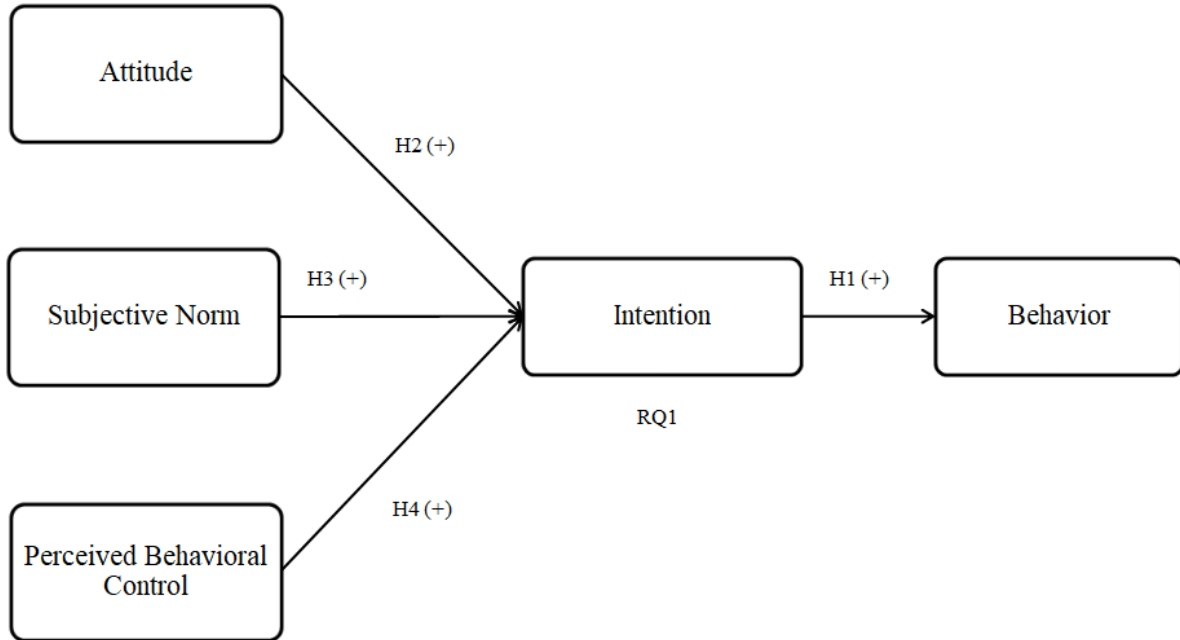
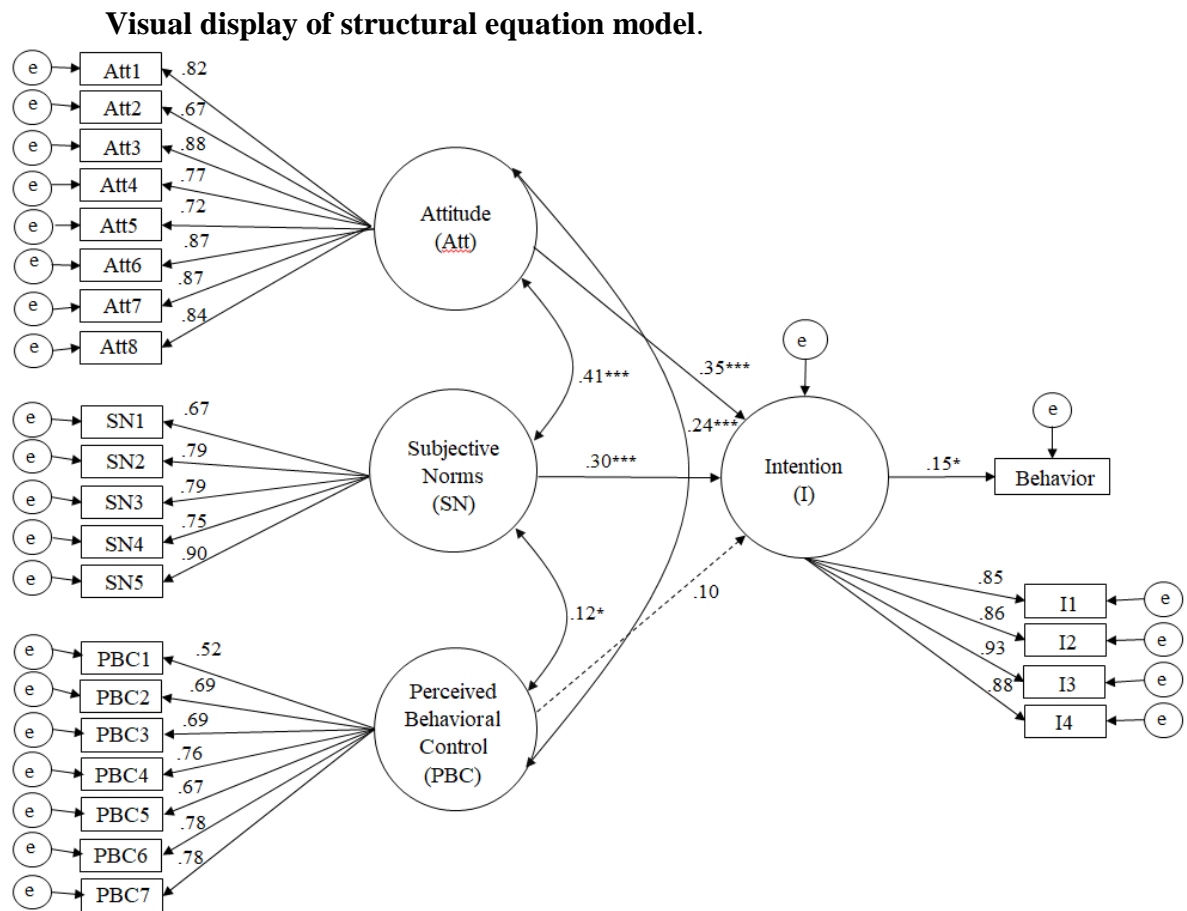


Figure 4



Note. *** $p < .001$. ** $p < .01$. * $p < .05$.

APPENDICES

Appendix A

Questionnaire.

Introduction Directions: This study requires that you respond to questions regarding your relationship and interactions with your child, who is...

- a. **In 1st to 12th grade.**
- b. **Participates in a competitive and organized sports league (i.e., a club, recreational, or school league).**
- c. **Plays tackle football, soccer, wrestling, basketball, field hockey, ice hockey, or lacrosse.**

If you have multiple children who would meet the description above, please complete this entire survey **ONLY** in reference to the **eldest** of these children.

Are you older than 18 years old?

- Yes
- No [Send to end of survey]

What is your child's current grade level?

- 1st grade
- 2nd grade
- 3rd grade
- 4th grade
- 5th grade
- 6th grade
- 7th grade
- 8th grade
- 9th grade
- 10th grade
- 11th grade
- 12th grade
- Other [Send to end of survey]

Does your child currently participate in a competitive and organized sports league for tackle football, soccer, wrestling, basketball, hockey, or lacrosse?

- Yes, school league (e.g., high school or middle school league)
- Yes, club league (e.g., travel AAU or AYSO league)
- Yes, recreational league (e.g., church league or little league)
- No [Send to the end of survey]

What sport does your child currently play? (Select all that apply)

- Tackle Football
- Soccer
- Wrestling
- Basketball
- Ice Hockey
- Field Hockey
- Lacrosse

What is the sex of your child?

- Male
- Female

Sporting Issues

Instructions: Please answer the following questions in reference to actions you may have performed in the past.

Prior to this point in time...

1. Did you purchase your child new equipment (e.g., shoes)?
 - Yes
 - No

2. Did you have a conversation with your child about the importance of reporting concussion symptoms to adults (e.g., yourself, coaches, athletic trainers, doctors, or teachers)?
 - Yes
 - No

3. Did you help/provide your child with strength/conditioning training?
 - Yes
 - No

4. Did you talk to your child about balancing athletics and academics?
 - Yes
 - No

5. Did you plan/purchase items needed to ensure your child's hydration/nutrition?
- Yes
 - No
 -

Parental Approach to Sport Participation

6. Below are three descriptions. Please select the description that MOST closely matches how you are oriented toward your child's participation in contact sports.
- My family values my child's participation in contact sports. Their involvement in contact sports is important to our family identity and activities (e.g., conversations, time, and resources). Their participation in contact sports was never in doubt or was strongly encouraged by the family.
 - My family takes my child's participation in contact sports very seriously. Their involvement in contact sports is concerning and my family's identity is focused on their safety. Making the decision to allow them to play was difficult and included the consideration of the many risks.
 - My family takes a nonchalant attitude towards my child's participation in contact sports. Their involvement in contact sports is a relatively small part of my life and not something that is integral to my family's identity. While I have some minor concerns about their safety, I'm mostly happy that my child enjoys playing.

Attitude

Instructions: Please rate your attitude on the scales provided in response to the scenario below.

If I discussed with my child the importance of reporting concussion symptoms to adults, it would be...

	Harmful							Beneficial
	1	2	3	4	5	6	7	

7. _____

	Bad							Good
	1	2	3	4	5	6	7	

8. _____

Valuable							Worthless
1	2	3	4	5	6	7	

9. _____

Foolish							Wise
1	2	3	4	5	6	7	

10. _____

Unfavorable							Favorable
1	2	3	4	5	6	7	

11. _____

Helpful							Unhelpful
1	2	3	4	5	6	7	

12. _____

Useless							Useful
1	2	3	4	5	6	7	

13. _____

Practical							Impractical
1	2	3	4	5	6	7	

14. _____

Subjective Norm

Instructions: Please indicate the degree to which you agree with each statement below.

Strongly Disagree	Disagree	Somewhat Disagree	Undecided	Somewhat Agree	Agree	Strongly Agree
1	2	3	4	5	6	7

15. _____ The people in my life, whose opinions I value, think that I should talk with my child about reporting concussion symptoms.

16. _____ Other parents talk with their child about reporting concussion symptoms.

17. ____ Most people like me talk with their child about reporting concussion symptoms.
18. ____ It is expected of me that I talk with my child about reporting concussion symptoms.
19. ____ The people in my life, whose opinions I value, talk with their child about reporting concussion symptoms.

Perceived Behavioral Control

Instructions: Please indicate the degree to which you agree with each statement below.

Strongly Disagree	Disagree	Somewhat Disagree	Undecided	Somewhat Agree	Agree	Strongly Agree
1	2	3	4	5	6	7

20. ____ It is mostly up to me whether or not I talk with my child about reporting concussion symptoms.
21. ____ If I wanted to I could talk to my child about reporting concussion symptoms.
22. ____ I have complete control over talking with my child about reporting concussion symptoms.
23. ____ I am confident that I could talk with my child about reporting concussion symptoms.
24. ____ I determine if I talk with my child about reporting concussion symptoms.
25. ____ I have the ability to talk with my child about reporting concussion symptoms.
26. ____ I have say in whether I talk to my child about reporting concussion symptoms.

Intention

Instructions: Please indicate the degree to which you agree with each statement below.

Strongly Disagree	Disagree	Somewhat Disagree	Undecided	Somewhat Agree	Agree	Strongly Agree
1	2	3	4	5	6	7

27. ____ I intend to talk with my child in the immediate future about reporting concussion symptoms.
28. ____ In the immediate future, I intend to encourage my child to speak to an adult if they experience these symptoms.
29. ____ I intend to share what I know about concussion symptoms with my child in the immediate future.
30. ____ In the immediate future, I intend to tell my child to seek help if they experience concussion symptoms.

Demographics and Family Type

Instructions: Please answer the following questions about your demographic information

59. ____ What is your sex?
 - Male
 - Female
60. ____ What is your age? (Open text)
61. ____ What is your ethnicity?
 - Caucasian/White
 - African-American/Black
 - Hispanic/Latin(o/a)
 - Asian or Pacific Islander
 - Other[textbox]
62. ____ What region of the U.S. do you reside in?
 - West (AK, AZ, CA, CO, HI, ID, MT, NV, NM, OR, UT, WA, WY)
 - Midwest (IL, IN, IA, KS, MI, MO, MN, NE, ND, OH, SD, WI)
 - South (AL, AR, DE, FL, GA, KY, LA, MD, MS, OK, NC, SC, TN, TX, VA, WV)
 - Northeast (CT, ME, NH, MA, NJ, NY, PA, RI, VT)
63. ____ How many children do you have? (Open text)
64. ____ On a scale of 0-100, what percentage of your child's sporting events do you attend? (Slider scale provided)
65. ____ What is your highest level of education?
 - Some high school
 - High school diploma/GED
 - Some college
 - 2-year degree
 - 4-year degree
 - Graduate degree
66. ____ What is your annual household income? Choose the highest number if income is over the limit. (Slider provided with scale from \$0-\$500,000)
67. ____ Has your child/children ever been diagnosed with a sports-related concussion?
 - Yes

- No
68. _____ Have you ever been diagnosed with a sports-related concussion?
- Yes
 - No

If you are interested in seeking information about concussions to help you communicate with your child about the important of reporting concussion symptoms, please click on the “see resource” button below. Otherwise, the survey is complete and you may click on the “exit” button.

Thank you for taking the survey!

[Exit](#)

[See resource](#)

Appendix B

Recruitment advertisement.

Hi everyone! I am conducting a study on parent-child communication regarding sport-related issues. I am conducting this study for my thesis and future publication with my advisor and principal investigator Dr. Gregory Cranmer. We are looking for people who fit the criteria of being: **(a) at least 18 years old and (b) a parent or guardian of a child in any grade level between 1st to 12th who participates in a competitive and organized sports league (e.g., a club or school league) for tackle football, soccer, wrestling, basketball, ice or field hockey, or lacrosse.** If any of you fit these criteria, I would greatly appreciate it if you completed this survey (survey link attached below). It will only take 30 minutes for you to be part of this study. You will receive no direct benefit from this study. The results of this research will help researchers understand parent-child communication about sport-related issues. If you have any questions, feel free to email me (jlfonta@g.clemson.edu) or the principal investigator (gcranme@clemson.edu).

survey link will be attached here

Appendix C

Consent letter.

Information about Being in a Research Study Clemson University

Parent-Child Communication regarding Sport-Related Issues

KEY INFORMATION ABOUT THE RESEARCH STUDY

Voluntary Consent: Dr. Gregory Cranmer is inviting you to volunteer for a research study. Dr. Gregory Cranmer is a professor at Clemson University conducting the study with Joseph Fontana who is a graduate student at Clemson University.

You may choose not to take part and you may choose to stop taking part at any time. You will not be punished in any way if you decide not to be in the study or to stop taking part in the study.

Study Purpose: The purpose of this research is to understand the barriers and motivations to parent-child communication regarding sport-related issues.

Activities and Procedures: Your part in the study will be to complete an online survey with questions regarding your child's participation in sports as well as communication you have with your child about sport and health.

Participation Time: It will take you about 10 minutes to be in this study.

Risks and Discomforts: There are certain risks or discomforts that you might expect if you take part in this research. They include feeling distress or discomfort related to answering questions regarding the relational quality between you and your child as well as potential issues your child may be susceptible to. You may skip any questions that make you feel uncomfortable.

Possible Benefits: You may receive a benefit in the form of a lottery drawing for a chance to win one of four \$25 Walmart gift cards. Also, the results of this research will help researchers understand parent-child communication about sport-related issues.

EXCLUSION/INCLUSION REQUIREMENTS

The only criteria for inclusion in participating in this study if you are:

- (a) at least 18 years old
- (b) a parent or guardian of a child in any grade level between 1st to 12th

- **(c) your child participates in a competitive and organized sports league (i.e., a club, recreational, or school league)**
- **(d) your child plays tackle football, soccer, wrestling, basketball, ice hockey, field hockey, or lacrosse**

PROTECTION OF PRIVACY AND CONFIDENTIALITY

The results of this study may be published in scientific journals, professional publications, or educational presentations. Participation in the study will only require providing demographic information and no name or other identification information will be asked for before, during, or after completing the online survey. Upon completion of the project, survey data will be kept for 5 years before being deleted and shredded, if the data is printed out. Data generated via participants' answers to the online survey will be downloaded and no identifying information will be collected. All computer files will be kept on a secured hard-drive in the office of the principal investigator. The information collected during the study could be used for future research studies or distributed to another investigator for future research studies without additional informed consent from the participants or legally authorized representative.

CONTACT INFORMATION

If you have any questions or concerns about your rights in this research study, please contact the Clemson University Office of Research Compliance (ORC) at 864-656-0636 or irb@clemson.edu. If you are outside of the Upstate South Carolina area, please use the ORC's toll-free number, 866-297-3071. The Clemson IRB will not be able to answer some study-specific questions. However, you may contact the Clemson IRB if the research staff cannot be reached or if you wish to speak with someone other than the research staff.

If you have any study-related questions or if any problems arise, please contact Dr. Gregory Cranmer at Clemson University at gcranme@clemson.edu.

CONSENT

By participating in the study, you indicate that you have read the information written above, been allowed to ask any questions, and you are voluntarily choosing to take part in this research. You do not give up any legal rights by taking part in this research study.

By completing the attached survey you are agreeing to participate in this research study. Please select to continue (with consent) or exit the window.

[Continue](#)

[Exit](#)

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