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Qualitative Study on Adoption of Heads Up Tackling by Youth Football Coaches

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Qualitative Study on Adoption of Heads Up Tackling by Youth Football Coaches

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B.S.
University of Miami
2014

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An abstract of
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Abstract

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Background: Football accounts for nearly half of all concussions that occur in organized sports in the United States. The majority of concussions in football result from front of the head or side of the head impacts. Injury prevention initiatives that reduce the frequency of helmet impacts have inherent consequences for the safety of the sport.
Purpose: Using the Diffusion of Innovations (DOI) framework, this study aimed to determine the perceived characteristics of Heads Up Tackling that contribute to adoption or non-adoption of the technique by youth football coaches, as well as understand how certified coaches have implemented the Heads Up Tackling training.
Methods: In-depth semi-structured interviews were conducted with ten youth football coaches to provide information on experiences with adoption and implementation of Heads Up Tackling. Interviews explored coaching style, perceived strengths and weaknesses of Heads Up Tackling, and injury prevention in football. Thematic analysis of the interviews was used to code and analyze the data.
Results: Adoption of Heads Up Tackling was found to be a two-step process; completing the certification course and teaching the tackling techniques to the players. Findings indicated that advantages over traditional methods, compatibility of the technique with coaches, observability of the technique and its benefits, complexity of certification and implementation, and the trialability of the program, contributed to adoption or non-adoption of the tackling program. Factors external to coaches were also found to contribute to the adoption decision process. Further, implementation strategies used by the certified coaches included: (1) teaching the Heads Up Tackling technique and drills, (2) applying the concussion protocols taught in the certification course, (3) reorganizing practice structure, and (4) instituting parent clinics.
Conclusion: Although coaches are considered the primary decision makers, there are multiple factors external to the coach that influence adoption and compliance with the tackling strategies advocated by the Heads Up Football program. Since Heads Up Tackling may have important implications for player safety, addressing the challenges to adoption and implementation are necessary to stimulate diffusion of the program moving forward. Findings indicate widespread implementation may require policy-level intervention.

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CHAPTER I

Introduction

The incidence of sports-related concussions in the United States is estimated to be up to 3.8 million cases annually (Johnson, 2012; King, Brughelli, Hume, & Gissane, 2014; Wing & James, 2013). Concussion is a subset of traumatic brain injury (TBI) (Guskiewicz et al., 2004). The definition agreed on at the *4th International Conference on Concussion in Sport* defines concussion as a "complex pathophysiological process affecting the brain, induced by traumatic biochemical processes" (McCrory et al., 2013, p. 2). More simply stated, concussions are the result of an impulsive force that is transferred to the head following a jolt, bump, or blow directly to the head or to another part of the body (Benson et al., 2013). The impact of this force causes the head and brain to accelerate back and forth, causing the brain to bounce around against the skull (CDC, 2014b).

Concussions are the second leading cause of TBIs among individuals 15-24 years old, and among the approximately 300,000 head injuries that occur in high school athletes every year, 90% are due to concussions (Karlin, 2011; King et al., 2014). The Centers for Disease Control and Prevention (CDC) reported that emergency room visits for sports-related TBIs has increased by 60% over the past 10 years, indicating the growing prevalence of concussions in the athletic community (CDC, 2011). This is especially troubling given the severe impact concussion can have on the athletes who sustain one. Concussions may cause a range of symptoms, and evidence suggests that there may be a cumulative effect, as well (Wing & James, 2013). Significant cognitive deficits in planning, information processing, and memory, in addition to mood changes

and reduced reaction time, have been noted (Wing & James, 2013). Additionally, sustaining repeated concussions might lead to long-term issues, including Chronic Traumatic Encephalopathy (CTE), depression, and increased recovery (Patel & Reddy, 2010). Furthermore, if a second concussion is sustained during the vulnerable period prior to full recovery from the initial concussion, it can exacerbate these cognitive impairments as well as prolong recovery (Lovell, 2009; Wing & James, 2013).

While the majority of literature on the burden of injury is focused at the collegiate and professional level, the impact of sports-related concussion on the developing youth brain is particularly disconcerting. Annually, approximately 30-45 million youth in the U.S. engage in organized sports (Karlin, 2011). Considering children and adolescents have an increased risk of sustaining a concussion, and typically have longer recovery times, the issue of youth sports-related concussion is especially important (CDC, 2011; Wing & James, 2013). Despite the high burden of concussion for the youth athletic population, much of the research on sports-related concussion is done on collegiate and adult athletes. Further, the research done on sports-related concussion among youth primarily focuses on high school athletes (Karlin, 2011), although children and adolescents age 8-13 constitute 40% of the total number of sports-related concussions (Karlin, 2011).

According to the CDC, among high school sports, the highest incidence of concussions occurs in football; with concussions occurring at a rate of 0.47 per 1000 athlete exposures (CDC, 2011). Football accounts for almost half of all organized sport concussions (Young, Daniel, Rowson, & Duma, 2014). The high incidence is due, in part, to the nature of the sport and its popularity at all skill levels (Rowson et al., 2014). An

estimated 5 million players participate in organized football in the U.S. (Daniel, Rowson, & Duma, 2012). Children and adolescents, ages 7-14, represent approximately 70% of these players (Wong, Wong, & Bailes, 2014). Additionally, in 2015 over 2.1 million adolescents aged 6-14 participated in tackle football, specifically (Alic, 2016).

With the advent of new impact sensing technology, such as the H.I.T. (Head Impact Telemetry) System and Shockbox, researchers have been able to measure the magnitude of hits players at all levels are experiencing (Daniel et al., 2012; Wong et al., 2014; Young et al., 2014). Although it was presumed that youth athletes—due to the slower game pace and smaller body masses— rarely experience the high impact tackles that could lead to concussion, recent studies have refuted this assumption (Wong et al., 2014). This recent evidence may pose some troubling news concerning the safety of the vulnerable brains of children participating in youth and Pop Warner football.

Additionally, no conclusive evidence has been found to support the effectiveness of equipment in reducing the number of concussions suffered in sports (Benson et al., 2013; McCrory et al., 2013; Rowson et al., 2014). Studies have shown that helmet use may reduce the impact force, but concussions remain common in football (Guskiewicz, Weaver, Padua, & Garrett, 2000; McCrory et al., 2013). Unfortunately, there are differences between different helmet models in ability to reduce impact and, hence, concussion risk (Rowson et al., 2014). Also, it has been suggested that adoption of more protective equipment may lead to more reckless playing techniques, due to a perceived invincibility (McCrory et al., 2013). Thus it has been posited that rules changes are necessary to ensure safety where Return To Play (RTP) policies, and novel technology and equipment are lacking. While the current RTP guidelines are necessary in

management of concussion, they are still post-concussion policies. In order to reduce the incidence of head injury and avoid the potentially long-term consequences of concussion in sport, prevention is ultimately the goal (Johnson, 2012).

To address these concerns, USA Football teamed up with the National Football League (NFL) to launch the Heads Up Football program. The purpose of the program is, in essence, to take the head out of the game, or specifically the tackle, thereby reducing the incidence of concussion in football. USA Football describes the Heads Up Football program as a "comprehensive collection of resources, programs, application and promotions to create a change and address the complex challenges of player health and safety in youth and high school football" (USA USA Football, 2010). In 2013 the NFL and Pop Warner announced a partnership to endorse the Heads Up Football Program, proclaiming, "Heads Up Football is taking root in the culture of our game as the gold standard for better, safer play. With this program, and many other initiatives, we are collectively creating a new culture of safety at every level of the game" (Goodell & Butler, 2013, para. 7).

While the program advocates concussion education for coaches and athletes, and the importance of properly fitted equipment and hydration, perhaps the cornerstone of Heads Up Football is Heads Up Tackling. Heads Up Tackling features a step-by-step protocol that teaches proper tackling techniques to improve player safety, through a reduction in helmet impacts (USA USA Football, 2010). Players are taught to keep their heads and eyes up at the moment of impact, and instead use their shoulders as the point of contact. USA Football offers Heads Up Football certification for coaches. The program boasts over 150,000 certified coaches and over 5,500 football leagues have adopted

Heads Up Tackling (USA USA Football, 2010). Although, a large number of coaches claim to be Heads Up certified, however, no studies have assessed whether these tackling techniques are actually being used in youth football games.

Recent studies have assessed the outcomes of adoption of the Heads Up program. A 2015 study comparing the number of head impacts that occurred during games and practices among Heads Up Football participating youth football leagues and non-Heads Up leagues showed that, for 10g and 20g force thresholds, Heads Up players had significantly fewer head impacts per practice than players in non-Heads Up leagues (Kerr et al., 2015). These differences were not found for games, though, suggesting there may be issues with implementation of Heads Up Tackling in game situations.

Although the Heads Up program was initiated in 2012, searches of Google Scholar and PubMed since that time produced no research that has the investigated the actual implementation of Heads Up Tackling by certified coaches, nor the motivations of the certified coaches' who have adopted this tackling technique for their teams. Addressing this gap could further our understanding of the value of the Heads Up Football program. The Diffusion of Innovations Theory may provide some insight into the adoption decision process among certified coaches, which could inform strategies to encourage widespread use of the technique in competition.

The Diffusion of Innovations (DOI) theory was created by Everett Rogers to describe how technology and ideas are communicated over time and spread among members of a social system (Rogers, 1995). According to DOI an "innovation" can take the form of a tangible object, or an idea or practice. An innovation is perceived to be new by the decision-making individual or group. Adoption of the innovation is characterized

by the uptake of the object or idea by the decision-making unit. There are five major steps to the Innovation-Decision Process: knowledge, persuasion, decision, implementation, and confirmation (Rogers, 1995). *Knowledge* refers to the individual or group learning about the innovation and how it works; *Persuasion* is characterized by the individual or group forming favorable or unfavorable attitudes toward the innovation; *Decision* is when the decision-making unit participates in activities that lead to adoption or rejection of innovation; *Implementation* refers to use of the innovation; and *Confirmation* refers to the period after the innovation adoption, when the individual or group seeks reinforcement regarding the decision and decides whether to continue or discontinue use. It is important to note that because diffusion occurs within an existing *social system*, the social system also exerts influence on the diffusion process, often contributing to the "innovativeness" of individuals (Sahin, 2006).

This study focuses on the *Persuasion* aspect of the innovation-decision process, specifically, the characteristics of the innovation that serve to either persuade or deter adoption. Rogers (1995) describes five characteristics of the innovation that influence persuasion: (1) *relative advantage* of the innovation over the current practice, object, or idea, (2) *compatibility* of the innovation with the values and attitudes of the decision-making unit, (3) *complexity* of adopting the innovation, (4) *trialability* of the adoption prior to adoption, and (5) *observability* of the use of the innovation. These factors are important predictors of innovation adoption or rejection. Therefore, this study aims to explore how youth athletic coaches (the decision-making unit) perceive the characteristics of the Heads Up Football program (the innovation) that contribute to adoption and implementation of the Heads Up Tackling technique.

Research Questions

The research questions this study aims to address are: (1) What are the perceived characteristics of Heads Up Tackling that contribute to either adoption or non-adoption of the technique by youth football coaches? and (2) Among Heads Up certified coaches, in what ways is the Heads Up Tackling technique implemented?

CHAPTER II

Review of the Literature

Public Health Importance of Concussion

In spite of the growing evidence about the heightened vulnerability of the young brain, and the sheer number of athletes participating in youth sports, the impact of sports-related concussions is understudied among pediatric populations (Keightley et al., 2014; Kirkwood, Yeates, & Wilson, 2006; Moore et al., 2016). In a study of 349 symptomatic and recovered children and adolescents, aged 5-18, within four weeks post-concussive injury, Ransom et al. (2015) found a significant relationship between greater severity of concussion symptoms and adverse academic outcomes and more school-related issues. Moore et al. (2016) found that athletes 8-10 years old, with a history of concussion, exhibited behavioral deficits in attention, working memory, and inhibition and impulse control. EEG activity during a series of tasks, demonstrated previously concussed athletes also had neuroelectric differences in visual attention, conflict resolution, and attentional resource allocation, as compared to controls.

Further, second impact syndrome (SIS), a catastrophic swelling of the brain—occurring when a second, typically minor, head injury occurs before full recovery from the initial concussion—is most commonly reported among children and adolescents (Gilbert & Johnson, 2011). Although rare, SIS has a mortality rate near 50% and an almost certain impact of severe disability (Bowen, 2003).

The absence of large-scale prospective studies evaluating the impact of sports-related concussions over the career of the athlete, also contributes to gaps in knowledge about the long-terms consequences of concussions sustained in adolescence or before.

However, a retrospective study by Stamm et al. (2015) examining the neurocognitive abilities of former NFL players, found that former players that were first exposed to football before 12 years old performed significantly worse on measure of executive function, memory, and verbal IQ, compared to those who were first exposed to football at age 12 or older. Their findings suggest that potential exposure to early successive head impacts during early adolescence—a critical period of neurocognitive development—may have later life consequences for these athletes. Given the vulnerability of the young brain and the potential cumulative nature of repeated concussive injuries, the safety of youth sports as it relates to concussions is a great public health concern.

Identification and Treatment of Sports-related Concussions

The evidence suggests that the actual incidence of sports-related concussions that occur every year is severely underestimated (King et al., 2014; McCrea, Hammeke, Olsen, Leo, & Guskiewicz, 2004; Patel & Reddy, 2010; Wing & James, 2013). This may be due to a variety of factors including the subjective nature of concussive symptom recognition, as well as multiple barriers to symptom self-reporting identified throughout the literature. Although potential symptoms have been identified, symptoms often vary by person and situation; thus there is no universally accepted definition of what a concussion is or looks like (Guskiewicz et al., 2004; King et al., 2014; Lovell, 2009). Loss of consciousness occurs in fewer than 10% of cases; therefore, symptoms may be subtle (King et al., 2014; Wing & James, 2013). This is further complicated by the absence of a biomarker to test for concussion, as well as a lack of structural brain changes in the concussed brain. This makes concussion identification and diagnosis difficult. The reliance on self-report is often complicated by athletes' fear of appearing weak, coaches'

attitudes towards injuries, perceptions of responsibility to teammates, desire to continue playing, and belief that their injury is not serious enough to warrant medical attention (Chrisman, Quitiquit, & Rivara, 2013; McCrea et al., 2004). A study on college football players found that higher levels of perceived coach support for concussive symptom reporting was significantly associated with fewer undiagnosed concussions and returning to play while symptomatic following an impact (Baugh, Kroshus, Daneshvar, & Stern, 2014).

There is no specific "template" for treating sports-related concussions; rather, an individualized approach should be used, depending on various aspects including the athlete's symptoms, cognitive functioning, and severity (Putukian & Kutcher, 2014). Current practices involving concussion management focus on the benefit of physical and cognitive rest, and gradual, stepwise return to play (McCrory et al., 2013). While most athletes recover within 7-10 days, some may have prolonged symptoms, further emphasizing the need for player-specific management (McCrory et al., 2013). Determining when a concussed player can safely return to play poses a challenge for medical professionals in sports. A unique challenge to concussion management is the complexity of objective signs of complete recovery (Guskiewicz et al., 2000). Moreover, difficulties in evaluation, diagnosis, and treatment of concussion indicate the need for preventive strategies in dealing with this "invisible" injury.

Return to Play Legislation

Beginning with the Zachary Lystedt Law in 2009, "Return to play" (RTP) laws have been enacted in all 50 states and the District of Columbia (CDC, 2014a). While there may be variance in aspects of the law in different states, all include: education for

parents, players, and coaches; immediate removal of an athlete with a suspected concussion from play; and required medical clearance from a health care professional (CDC, 2014a).

The Georgia Return to Play Act of 2013 (House Bill 284) went into effect on January 1, 2014. While comparable to other similar state legislation in mandating concussion education for parents/guardians, requiring removal from play after a suspected concussion, and clearance by a licensed health care professional prior to return to play, Georgia is one of few states that extends the law beyond school athletic programs (Cook, King, & Polikandriotis, 2014) to recreational and other leagues. However, the only provision of the legislation that is mandated for recreational leagues is that they are required to provide parents and athletes with concussion information sheets. The absence of a comprehensive concussion education and management bill for recreational leagues is particularly concerning given the large numbers of athletes that participate in sports outside of school. This is especially true, considering that youth tackle football begins as early as age 5, before access to organized school play. Due to the absence of a governing of body over youth sports adoption and implementation of concussion guidelines is the responsibility of the parks and leagues, making standardization of care impossible.

Mechanics of Concussion

Using data from the National High School Sports-Related Injury Surveillance System, Kerr et al. (2014) found that the majority of concussions that resulted from player collisions occurred from “front of the head” and “side of the head” impacts, 44.7% and 27.3% respectively. Additionally, concussions that featured loss of consciousness were more likely to be “top of the head” impacts (Kerr et al., 2014). Roughly a quarter of

the concussions sustained were by those athletes who had their heads down when contact was made (Kerr et al., 2014). Viano, Casson, and Pellman (2007) similarly revealed that striking the other player with a head down position maximized the energy transfer, and thus, the magnitude of the impact. Consequently, the striking player experienced the brunt of the force compared to the player being struck (Viano et al., 2007). Helmet-to-helmet contact causes a higher acceleration of the head post impact (Broglio, Surma, & Ashton-Miller, 2012),whereas, chest-to-chest impacts have less momentum and velocity transmitted to the head and brain (Broglio et al., 2012; Viano et al., 2007).

Limited research has explored the impact of hits and tackling techniques on the youth athlete below high school age. A study of Pop Warner football players found that players experienced 3.7 head impacts per game and 1.5 head impacts per practice (Wong et al., 2014). High magnitude impacts were also noted and two concussions were suffered during the season. These results contradict the previously held belief that young players do not sustain these high impact contacts. Further, players who participated in head-to-head hits had the highest linear accelerations, as measured by helmet-bound impact sensors (Wong et al., 2014). Studies on 7- to 8-year-old football players have also found that many of the high impact hits in this age group occur during practice (Cobb et al., 2013; Daniel et al., 2012; Young et al., 2014). Young et al. (2014) demonstrated that some of the impacts registered by athletes of this age group were comparable to the magnitude of hits seen at the high school and collegiate level. Though the frequency of these high magnitude hits is significantly less in youth athletes than at higher levels of play, these results are still cause for concern (Cobb et al., 2013; Wong et al., 2014).

Further, Young et al. (2014) found that the majority of impacts occurred to the front of the helmet; these hits also resulted in the largest magnitude of rotational acceleration.

Policy Interventions for Concussion Prevention

Given these empirical findings and the severe nature of concussion in athletics, amendments in game rules have been enacted at different levels of football as well as other high incidence sports. Pop Warner football was one of the initial football leagues that instituted practice changes in response to these findings (Wong et al., 2014). In 2012, Pop Warner Football eliminated head on tackling in which players are lined up three or more yards apart, and limited contact drills to no more than 1/3 of practice time (Wong et al., 2014; Young et al., 2014). Cobb and colleagues (2013) assessed head impact exposures among three teams of 9- to 12-year-old football players. One of the teams had adopted the Pop Warner guidelines concerning limited contact in practices, and thus, had significantly fewer impacts per practice than the other two teams, but there was no significant difference during games (Cobb et al., 2013). The absence of a significant difference in head impacts during games among the three teams signals that more work needs to be done in the reducing concussion risk in game situations.

Prior to the 1976 rule change by the National Collegiate Athletic Association (NCAA) and the National Federation of State High School Associations, over 30 deaths from severe brain injury occurred annually in football (Crisco & Greenwald, 2011). Since head down contact was recognized as the main cause of spinal cord and severe brain injuries, the 1976 rules change eliminated tackling where contact was initiated using the helmet (Heck, Clarke, Peterson, Torg, & Weis, 2004). This change was successful in reducing the incidence of head and neck injuries (Crisco & Greenwald, 2011; Heck et al.,

2004). Subsequently, using the shoulder or chest as the point of contact, with a head up position also reduced risk of severe head and neck injury (Heck et al., 2004). However, helmet contact rules are seldom enforced and top of the helmet impacts remain common throughout the sport (Heck et al., 2004).

The American Academy of Pediatrics is one of several organizations that recommend a 15-year-old age limit to body checking in ice hockey, but analogous recommendations and policies have yet to be made in youth tackle football leagues (Johnson, 2012). However, such measures have been shown to be effective in injury reduction in hockey (Benson et al., 2013; Daneshvar, Nowinski, McKee, & Cantu, 2011; Emery, Hagel, Decloe, & Carly, 2010; Macpherson, Rothman, & Howard, 2006). In Ontario, Canada, body checking—a defensive move used to obstruct the opponent or separate them from the puck— is allowed at age 10 and up, while in Quebec body checking is not allowed until 14-15 (Macpherson et al., 2006). In their study, Macpherson et al. (2006), found that the likelihood of experiencing a concussion among 10-13 year old players was higher in the places where body checking was allowed. Also, where checking was allowed, more checking injuries occurred among younger players. The severity of these checking injuries was also greater for Ontario; Ontario players suffered significantly more fractures than their non-body checking Quebec counterparts. Despite presumptions that learning to body check earlier might serve as an advantage for Ontario players—enabling them to become better players since they start at an early age—the study found that they had greater odds of suffering checking injuries and concussions than Quebec players at the body checking permitted age (Macpherson et al., 2006).

Conversely, Hagel et al. (2006) demonstrated that a 2002 rules change by Hockey Canada that reclassified youth ice hockey levels led to an increased risk of injury for players. Prior to the reclassification 10- and 11-year-old players were classified as Atom level (no body checking allowed) and 12 and 13 year olds were considered Pee Wee level (body checking allowed). The 2002 rules change reclassified Atom level as age 9-10 and Pee Wee as 11-13. Consequently, the study found a significantly higher rate of injuries among 11 year olds after the reclassification. Further the injury rates of 10 and 12 year olds— who were not affected by the rules changes—did not change (Hagel et al., 2006).

Diffusion of Innovations in Sports Literature

A recent study by Beaudoin, Callary, and Trudeau (2015) explored the adoption-decision process and implementation of a Long-Term Athlete Development Model (LTAD) advocated by Sport Canada using Rogers' theory. LTAD is a model, featuring seven developmental stages, proposed to aid in the development of elite competitive athletes and reduce the decline in physical activity participation among Canadians. The researchers investigated characteristics of LTAD that contributed to adoption of the model, as well as the degree of implementation, in a qualitative study of Canadian coaches, who had either adopted (full or partial) or implemented the innovation. They found that DOI was an adequate theory to explain the adoption and implementation of LTAD by these coaches. Participants cited the advantages of the model being a tool for guiding coaches, having a long-term vision for athlete development, containing similar aspects to practices they were already using, and serving as a necessary resource for coaches with little experience. However, the degree of adoption and implementation was limited by a variety of factors, such as inadequate organizational support, importance

placed on sports performance, lack of understanding of the full model, and difficulty identifying the development stage of their athletes.

Despite evidence to suggest the effectiveness of primary prevention strategies, such as body checking and contact time policies, in reducing concussion risk, searches of Google Scholar and PubMed suggests no research has explored the diffusion or adoption decision of these innovations. Understanding the factors that may predict adoption may enable more widespread adoption of such injury prevention innovations. Sawyer et al. (2010) did, however, use DOI to explore the innovation characteristics and adoption of the CDC's *Heads Up: Concussion in High School Sports* toolkit among high school athletic coaches—with coaches citing the toolkit's ease, usefulness, appeal and appropriateness as advantages. Subsequently, these factors have contributed to the widespread diffusion and adoption of the toolkit, with 77% of coaches surveyed indicating easier concussion identification, and 72% reporting educating others about concussion management after using the toolkit (National Center for Injury Prevention and Control, 2008). While the toolkit has aided coaches in identifying and managing concussion, many of these concepts still target secondary prevention; thus more research is needed in understanding the adoption and diffusion of primary prevention strategies, like Heads Up Tackling.

CHAPTER III

Methodology

Design

This study is a qualitative study, using semi-structured phone interviews, with youth football coaches in the greater metro Atlanta area. Qualitative research methods are often used for exploratory purposes, to investigate phenomena about which little is known. In-depth interviews, enable participants to serve as the experts on their own experience and, thus, give them the opportunity to share their experiences and perceptions in their own words. Further, qualitative research is useful for "obtaining culturally specific information about the values, opinions, behaviors and social contexts of particular populations" (Mack, Woodsong, MacQueen, Guest, & Namey, 2005, p. 1). Due to the exploratory nature of qualitative inquiry the focus is not on generalizability. Consequently, sample sizes of qualitative research studies are typically small and do not require power calculations, as in quantitative research, to determine appropriate sample size (Ritchie, Lewis, Nicholls, & Ormston, 2013).

A qualitative approach was used for this study because of the limited research on the subject. USA Football's Heads Up Football program is a relatively new initiative. Google Scholar and PubMed produced no other studies to date that have looked at attitudes and perceptions of the program or similar football concussion prevention strategies. Thus, preliminary research is needed to explore this area of public health. In-depth, one-on-one interviews with coaches will allow the researcher to gain an in-depth, rich understanding of the factors that contribute to adoption of Heads Up Tackling, as well as actual implementation of the technique by certified youth football coaches. Given

the recent push for nationwide concussion policy implementation over the past five years, understanding motivators and barriers to safer play protocols are critical to creating an environment that facilitates safer sports participation.

Participants

The researcher interviewed a sample of ten youth football coaches of teams in the greater metropolitan Atlanta area. Participants were head coaches for teams that participate in a greater metropolitan Atlanta youth football leagues. The participants in this study were recruited by contacting Atlanta youth football league offices and area middle school coaches, through email. Additionally, a community contact provided the researcher with a list of local Heads Up certified youth football coaches and email addresses. From the initial cohort of coaches, snowball sampling was used to access more participants; where interviewed participants connected the researcher with other possible candidates for the study. Potential participants were screened to ensure that they met the inclusion criterion for the study: participants must have been over the age of 18, speak English, and be coaches of football players between the ages of seven and 14.

Measures

In-depth, semi-structured interviews were conducted with the ten coaches. Interviews covered background in coaching, perceived strengths and weaknesses of Heads Up Tackling, experience with Heads Up, and future directions of injury prevention in football. An Interview Guide based on Diffusion of Innovations theory was used to address the research questions (**Appendix A**). DOI constructs that were used for the development of the interview guide are: adoption, implementation, felt needs, relative advantage, compatibility, complexity, observability, and trialability.

Adoption and Implementation. For this study, adoption was determined by whether or not the coach was Heads Up certified. Thus, coaches who reported being Heads Up certified were considered to have adopted the innovation, and those who were not certified were categorized as non-adopters. Further, to explore implementation strategies among Heads Up certified coaches, participants were asked questions about how they incorporated the tackling techniques into their coaching. For example, the interview guide included questions such as, "Tell me about your experience with the Heads Up program. How have your incorporated it into your coaching?"

Felt Needs. A few of the interview guide questions were used to obtain background information on coaches' perceptions regarding the need for the Heads Up Tackling innovation, as well as their attitudes, in general, toward the need for concussion management in youth football. These include questions such as, "Do you believe USA football's Heads Up Tackling initiative is needed? Why or why not?"

Characteristics of the Innovation. The bulk of the interview guide assesses the characteristics of the innovation that may have contributed to either adoption or non-adoption of Heads Up Tackling. The interview guide consists of items that address: the *relative advantage* of Heads Up Tackling over standard tackling techniques the *complexity* of adopting and/or implementing Heads Up Tackling; the *compatibility* of Heads Up with the values of the coach and his or her players); the *observability* of Heads Up Tackling); and the *trialability* of Heads Up Tackling.

Procedure

Recruitment. A purposive sampling method was used to recruit ten participants. Participants were recruited from several sources: Atlanta area leagues, community

contacts, participant referrals, and an Atlanta Falcons Youth Football Clinic. Recruitment for study participation began in September, by emailing the league offices and/or board members for the North Metro Atlanta Youth Football League, Metro Atlanta Youth Football League, Youth Football Alliance, and North Atlanta Youth Football League via email. These emails contained a brief introduction of the researcher and overview of the research project, and requested that the email be forwarded to the head coaches of all of the teams within the leagues' network. The introductory emails described the project as a "qualitative, exploratory study on injury prevention strategies" in youth football, and also contained relevant information about the study purpose and procedures. The email also included contact information for the researcher, if potential participants wanted more information and/or to express interest in the study. Following this introductory round of emailing, Google, Atlanta Public Schools, and youth football league website searches were used to find individual contact information for middle school coaches and recreational youth football team coaches in Atlanta and the surrounding area. These coaches were also contacted via email. This email contained a brief introduction to the researcher and research project, and contact information if interested in participating.

A community contact with connections to local Heads Up certified youth football coaches also provided the researcher with a list of area coaches who had attended a previous Heads Up Football training. Emails about the study were sent to these coaches in order to recruit more participants. Additionally, through this contact, the researcher was able to attend an Atlanta Falcons Youth Football Clinic that was attended by area coaches, parents, and athletes. Fliers containing brief information about the researcher, study aims, and procedures were posted and passed out to coaches in attendance. Contact

information for coaches who indicated interest in study participation was recorded. Interested coaches were contacted by telephone at a later date to discuss more about the study and willingness to participate.

Participant referrals were also used to generate a sample of coaches to reach out to via telephone call and or email. The final method of recruitment was through an Athletic Trainer at a Georgia Orthopaedic Clinic, who forwarded study information to youth football coaches within his network. These coaches were offered free CPR and First Aid training as an incentive for study participation. However, no participants were obtained through this method. In total 113 coaches, leagues, parks and schools were contacted by the researcher through phone and/or email.

All coaches interested in participating received a phone call. This call was used to screen them for the eligibility criteria noted earlier: age 18 or older, English speaking, and a team that consists of players aged 7-14. Coaches who met these criteria were then asked to indicate whether they used Heads Up Tackling. A phone interview date and time was set up with participants who met study eligibility. Participants were emailed a consent form for participation and asked to read and provide an electronic signature if still interested in participating. A flow diagram summarizing the recruitment process is presented in Figure 1.

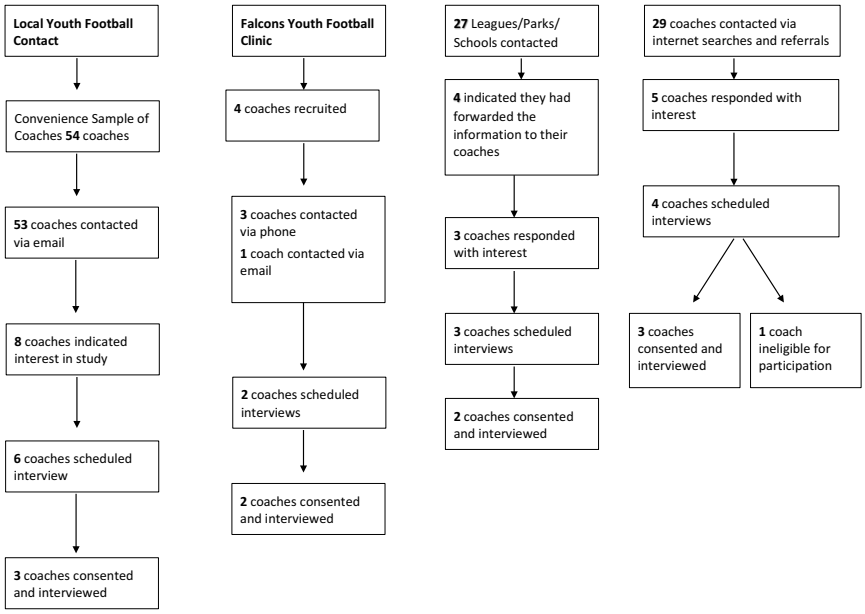

Figure 1: Youth football coach recruitment process. Four major sources were used to recruit study participants for in-depth phone interviews. A total of 113 youth football coaches, leagues, and parks in the greater Atlanta area were contacted via phone and email solicitations, with a total of 10 interviews conducted.

Data Collection. Phone interviews began in early October 2015 and concluded in late February 2016. The researcher conducted all of the interviews. All interviews were audio-recorded. Prior to beginning the interview, participants read and electronically signed the consent form (see Appendix B) or provided verbal consent. They were told that the interview was completely voluntary and reminded of their ability to end the interview at any point. Further, time was given for participants to ask questions about the consent form. For confidentiality purposes, the participants were not referred to by name in the interview and were only referred to by a numeric identifier on the name of the recording, to link recordings with transcripts.

The interview guide was used to guide all semi-structured, one-on-one interviews with the coaches. Interviews lasted approximately 30-45 minutes. The researcher transcribed the audio-recordings from the interviews verbatim, after the interviews within

a week of each interview and then uploaded the transcripts into MaxQDA 11.2.5 for coding and analysis. All identifying information was de-identified in the final transcripts, and only a numeric identifier was used to link the recordings with the transcripts.

Data Analysis. Since data collection and transcription was a simultaneous process, the initial coding tree was developed from the first five interview transcripts and the interview guide. However, after completion of the remaining interviews the codebook was revised to account for new information. The researcher and an MPH student independently coded two data-rich interviews. The codebook was guided primarily by the constructs of the DOI theory that were addressed in the interview guide questions. Free coding was also used to develop any other codes that emerged from the interviews. After independent coding of the two transcripts, they were compared for inter-coder reliability. The finalized codebook was used to code all of the remaining interview transcripts.

CHAPTER IV

Results

The research questions this qualitative study sought to address were: (1) What are the perceived characteristics of Heads Up Tackling that contribute to either adoption or non-adoption of the technique by youth football coaches? and (2) Among Heads Up certified coaches, in what ways is the Heads Up Tackling technique implemented?

Participants

As noted earlier, ten youth football coaches participated in interviews for this study. Participants were all head football coaches at different parks with coaching experience ranging from 3 to 19 years. In addition to their coaching positions, three of the participants were Player Safety Coaches/Coordinators and two were Athletic Directors; self-selection by these coaches may have influenced the findings. Despite a variety of recruitment methods only one coach who participated in the interview was not Heads Up certified. Thus, it was not possible to fully explore factors contributing to non-adoption. Further, a distinct pattern emerged in that all the interviewed coaches, with the exception of the non-certified participant, were required by their league or park to get Heads Up certified.

Overview

Interviews with these ten coaches revealed an existing framework of systems and subsystems all working to influence adoption and implementation of the Heads Up Football program. This suggests that there are multiple structural and societal factors leading to adoption of Heads Up Football, in addition to the characteristics of the innovation. From this set of interviews, it became apparent that, while youth football

coaches are important stakeholders in the diffusion process, there is not one clear decision making unit; rather differential adoption and implementation reflect the complexity of the organization of youth football in the nation. Likewise, these systems and subsystems operate within the dynamic cultural, social, and political environment that is influencing all levels of football; trickling down from the NFL to Pee Wee and Pop Warner.

Changing Context

A theme that emerged from interviews was the changing landscape of football in response, primarily, to the growing amount of research and awareness about the effects of concussions, and the corresponding media attention that has been focused on the safety of football. The result of this shift has been a steady decline in youth football participation and a change in the implementation of rules in the highest levels of the game. While all nine certified coaches were required by their organizations to receive Heads Up certification, responses indicated that adoption of Heads Up Tackling techniques by these larger organizational structures, as well as "buy-in" from coaches, was influenced by these recent trends. It was posited that player safety initiatives, like Heads Up, were necessary in order to "save the game" of football. One participant who noted that two years ago when his park first mandated the Heads Up certification, they were the only team in their league using Heads Up Tackling, stated that,

> Nowadays most programs I see have coaches who are Heads Up certified. So now it seems like less coaches, less programs don't have Heads Up certified, whereas before there were only one or two. Now most places are.
>
> *Interviewer: And what do you think is the cause of that shift?*
>
> I think the cause of it is because all of the publicity about NFL players getting hurt, people quitting the game, and numbers starting to dwindle for participation

> in sports, youth football. And we know NFL and…high schools said we gotta do something to kind of get to make the game a lot more safer. The publicity of people coming out, you know, showing the long-term effects of NFL players, college players, concussions, those studies. Made it— made a need for it to be safer.

Another participant acknowledged how the diffusion of Heads Up through youth and high school football is likely driven by the notable decline in sports participation:

> Actually, our high school coach was the one that enacted this— who kind of started it up. The head high school [coach] was the one who kind of led the charge getting us Heads Up certified. And our head high school coach, high school staff period, work with our youth league… And it seems like the one's who are teaching the certifications, they're high school coaches a lot of places. They've bought into Heads Up. Not everybody, but a lot of them have boughten in. They see the value of it. Like I said, they have seen the numbers drop. And you know to protect the game you gotta protect the kids.
>
> *Interviewer: The numbers of what dropped?*
>
> The numbers of participants. You know in the last decade or so, the number of kids is steadily declining. It's good to see kids coming back to football. We're making it safer.

Parents were recognized as key influencers in the adoption-decision process. In light of the publicity surrounding concussions in all levels of football, many parents are choosing to withhold their children from participating in youth football.

> Well, I mean, obviously the publicity around concussions, particularly in the NFL, but also through college, high school, and even into youth sports, I think has resulted in a need to shift how tackling is taught in a more systematic way. When I said that the way I was taught was different than how we do it today, that's true but most coaches were still keen to keep your head and neck out of the tackle. Although at the time it was more about neck injuries than it was about concussions. But I think that the fear of concussions is driving a lot of parents away from what I think is a really great sport.

And adoption of Heads Up Tackling techniques was recognized as important to attain the support of these influential decision makers— parents—and ultimately, reverse the trend in youth football participation.

> And I think that through the more systematic approach, that's kind of well publicized and in a way that keeps parents informed about what we're doing is key making sure that we still have a funnel of kids going through the program. Who are learning the lessons that we teach on field and off.

A few participants did find the recent media attention excessive, with one coach saying,

> I think, although much of it is warranted, I think CNN and the like have blown things out of proportion. You know, if you look at some of the raw data there's only about a four or five percent increase that a boy six to twelve playing contact football is gonna be concussed relative to a girl playing soccer in the same age groups.

However, regardless of whether people agree with it or not, changes are occurring throughout the game of football, and coaches must be willing to adapt and change if they want to coach football. As emphasized by one coach,

> It's a new game now. You gotta get used these new games, these new rules, because if you're not Heads Up certified you're putting your kids in jeopardy. They can not only get injured, but you can get a lot more flags thrown out. I think embrace the times; embrace the way the game is going because it's not changing. Not going back to the old way any time soon. So get on the train and get used to it.

This quote emphasizes the changing tide in terms of the way the game of football is played. The awareness and attention on the safety of football players is now being reinforced by rule changes. Therefore, not only is Heads Up adoption important for player safety but there are now consequences, in the form of penalties, that not implementing the techniques put coaches and their team at risk for.

As several coaches explained, these rule changes were not only occurring at the youth level. But actually the NFL—the highest level of the game—was also experiencing

similar shifts, indicating that, despite resistance, the game as a whole is advancing in the direction of Heads Up Football. Therefore, eventual adoption of Heads Up Tackling techniques is seemingly inevitable.

> Well, I mean, Heads Up is not going away, you know. The numbers as far as young men participating in football is dropping across the country. It's not just affecting Atlanta, or any other metropolitan city. So, it's not going away, it's something that's going to be here going forward. You already see people complaining again about the NFL, which is the highest level you can get to, about some of the hits and penalties that these guys are getting fined for. People are saying this wasn't the way it was when we played. Well, most people that complain about it— The league is still moving forward with fining and suspending people for doing it. So, it's not something that's going away. So, again, it's one of those things you have to adapt. You have to be welcome to change.

The increasing awareness of the risks associated with football, implementation of new NFL rules aimed at player safety, and the need to protect the longevity of the sport of football, is trending towards a new normal for standards of play. Coaches who delay adoption of Heads Up risk being left at a disadvantage. One participant described the need for Heads Up Tackling stating,

> It definitely is needed at our level. The way that things are changing, especially within the NFL, and at the college level. So, if this is the way that we going towards the future, it's best that they learn it now. Other than to try to get to a place later on where they're trying to do things the old way and be a step behind everyone else that's being taught the new way of doing things.

Organizational Factors

True adoption of Heads Up is actually a multistep process. As described in the interviews, certification is only the initial phase. Coaches then must incorporate these techniques into their coaching. For some of the coaches this first level of adoption was at the team/park level (n=5), whereas for others their entire league was required to be Heads Up certified (n=4). Differential adoption by these organizational structures was reflective of differences in culture and capacity of these organizations.

Culture. The shared values among members of a league or park, as well as the focus of the park were described as facilitators or deterrents to Heads Up adoption. Organizational bodies that prioritized player safety were very supportive of the Heads Up program. Participants were asked, " How do you feel about the attention youth football, specifically, has placed on addressing concussions?" A coach, who coaches a kindergarten and first grade team, explained:

> I think it depends on the program. The program that I'm with now— [Park name]— it is a central feature of our approach to the game. Even before we start working with the kids, we all go through the Heads Up training program, in addition to some other tackling techniques that we learn outside of the program. And we all have to be certified before we coach kid one. And that's an every year certification, so for us it is a primary focus of how we teach the game. I don't think that's true of other programs, based on how I've seen their kids tackle. So I think that's kind of the gist of it.

Whereas, programs where player safety is not the primary concern, may place less emphasis on Heads Up Tackling. One coach described how organizations where coaches are unsupportive of efforts to make the game safer and limit impacts, may prevent individual coaches from getting certified or implementing the techniques:

> I think at some programs where it's not emphasized, you actually have to go out and make this additional effort to become certified. And some programs, I think the attitude is why would you bother doing that? Why are you doing that and not working on your playbook? Or why are you working these non-contact drills instead of just getting these kids used to hitting. So I think maybe the biggest barriers are access, knowing what's out there and how helpful it could be. And then in a sense peer pressure, like in instances where if you're the only guy doing it and your other coaches are looking at you like, 'well, I don't understand why you're doing that.' That can be an issue too.

Additionally, as discussed earlier, the beliefs and values of community parents also impact Heads Up adoption at the organization level. In response to being asked about the attention youth football has placed on addressing concussions, a head coach of a nine and under team stated,

> It's a valid point. Um, especially in my environment where I mostly work with urban kids with single-family households— which is a single mom. And they want to know that their boys are safe. And yeah, that's one of the things that they need to feel comfortable that the kids are being taught properly and not in a way that's going to hurt them and cause problems later on down the line for them.

Further, dissonance between the values of a coach and the values of the larger organization may result in coaches moving to parks that embrace their core values. This was expressed by two of the coaches interviewed. One coach acknowledged attempting to persuade his previous park to endorse Heads Up Football certification, however it was not considered a priority.

> So the year I was on the board, I proposed that we make it required. And it just wasn't really a high priority. I think, if I recall right, the sense was well everybody's just kind of doing it right anyway, so that's just an extra hurdle that we're going to make these volunteer coaches jump through, in order to work with these kids. And the job is kind of hard enough, and we shouldn't add this extra barrier. I always thought that was kind of a nonsense response, but that was kind one of the things I was given.

The other coach voiced concerns about the aggressive nature of some adults within youth football programs, and the apparent disregard for player safety. Particularly, they were encouraging unsafe practices by requiring athletes to participate in youth football tournaments, which involved playing multiple games in a weekend.

> There are like groups set up on Facebook—mainly on Facebook— where it's nothing but youth coaches, youth football coaches, and the parents. They're like so into youth football. And they talk smack and mess back to each other. I mean where it can get brutal… So then they have these tournaments so you can play these other teams, because they may not be in your league, but you want to play these teams to say I'm better than you. So then you have these tournaments. And kids are playing 6 or 7 games in a weekend. And they're not paying attention to the health of the kids.

This comment highlights that in some youth football circles and organizations, there is an intense culture of winning and pride, that at times the safety of the children is not considered. The Heads Up certification process, however, made him aware that these

practices were not compatible with the health and safety of the players. Ultimately, leading him to leave the particular park that was mandating these tournaments:

> But, I can say that Heads Up Football and just seeing, hey, this is actually the proper way tackle, these are the things you need to look out for. And fatigue is one of the things that are in the video, that say's, 'hey, fatigue and dehydration, look out for that.' I put two and two together and said, hey, that means these tournaments are—they can't be good for these kids. But, I mean, so it changed my mind about the stuff. And that's part of the reason that I left the park that I was at before. Because they demanded that we play in these tournaments and all, and I feel like that wasn't for the benefit of the kids.

Organizational culture may be difficult to change. Thus, while the certification content and training may lead individual coaches to reassess their beliefs and coaching styles, without adoption at the organizational level it likely will not lead to the organization-wide cultural shifts necessary to facilitate implementation of injury prevention initiatives.

Capacity. Coaches also perceived organizational resources within youth football as important in the adoption-decision process. It emerged throughout the interviews that the certification costs varied. Costs ranged from free to 25 dollars per certification. Three coaches explained that they had received a discount on the certification, ranging from the full $25 to $10 off, through their park. One coach expressed he only had to pay $5 for the certification, which prevented costs from being a barrier for him. He explained, "Well thankfully [Park Name] waives our costs. I think we have to pay 5 dollars. So if there's any barrier maybe everyone doesn't, you know, get their certification paid for." Two coaches also indicated that their certification was free and they were not even aware that there is a cost. Their parks made the certification process so easy that they were simply given the information to access the site and take the certification course. One coach reported, "I'm not sure. They just send us a link and say, 'hey you got to do this test, and then print out the paper.' They may pay for it. I'm not sure."

Another participant described how in his park they had coaches trained in giving the Heads Up certification, which enabled them to certify their other coaches internally.

> Well with our program, in particular, our head coach of the high school more or less kind of trickled down and got the opportunity for the youth coaches… And then when he actually paid for the youth coaches—our directors—myself and one other person to go get certified and he liked it so much, he asked us about it. And actually said maybe we need to get everybody certified. And he had sponsored—paid for all the coaches to get certified. And then to train people—put people into the training, you know, for those who come late after the certification process, so we in-house certified them all at the same price. Cheap.

Oversight by league and park authorities was also critical to the degree of implementation of Heads Up by coaches. While leagues and/or parks may mandate Heads Up certification, not all of them have the infrastructure to ensure follow-through among coaches. As explained by one coach, these differences in resources (including parents) among parks result in variability in implementation in leagues that require certification:

> I've seen it with a couple of our parks that we compete against, but not every park is doing it, yet. Most of them are. But ours happens to be an extremely well run park with a lot of organization. We have a thirty five-member board… It's a high-income neighborhood. Its demographic is very supportive of what we're doing. Some of these programs that we're playing against, it's very different. We got coaches that are getting in cars and driving around town and getting them [the players] and taking them to practices. And they don't have parental support, they don't have parents helping review terminology or talking to the kids about what's going on… It's a little more old school. They're doing the best they can but they don't have the same organization we do.

Several coaches also expressed having regulatory personnel in place to oversee the adoption and implementation of Heads Up Tackling by their coaches. One coach described how his league was able to enforce their Heads Up Football certification requirement stating,

> I don't [know] first year if it was required or not… I think they said it was required but they didn't follow up on it, in terms of like having documentation requirement to show you had actually taken it. I think the way it's set up now is, that the league having an account to which we all take the course and then the

> league official— who is in charge of documenting that everyone's taking the appropriate training… he will kind of monitor that. And once again, when teams go through the certification process if all the coaches have not been through that process, then they just can't coach. And the team can't play. So if the head coach hasn't done it, the team is forfeiting that game. So, if you're heavily involved in this stuff, that's a pretty serious penalty and it makes people pay attention.

As noted previously, the certification process is only the first step of the adoption process. Assurance that coaches actually implement the tackling techniques is not guaranteed. Thus regulation is needed in some capacity for this purpose. Two participants actually had personnel responsible for monitoring implementation of Heads Up within their programs. One of them said,

> So you watch the video, some range in length from ten minutes to half an hour, depending on the subject. Then at the end you're tested on your knowledge based on how well you paid attention to it. And then through our program, I know that throughout the year the Athletic Directors and the coaches from the high school will come in and observe what we're doing to make sure that we're all following the protocol.

However, not all programs have this regulatory capacity. One participant, as Player Safety Coordinator for his program, was required to get Heads Up certified. He was then responsible for relaying the information he learned through the Heads Up certification to the other park coaches, who were not required to be certified. He voiced that, although coaches were mandated to come to his training session, there was no infrastructure in place to make sure that coaches then implement it. And the success of the program hinges on that implementation.

> If it was a national standard that from youth all the way up until high school, college, and maybe even the pros— this is the standard, there's a governing body, and you must do it that way— then I could see it being real beneficial to everyone from every level. But, you have where it's left up to the actual park to enforce it, implement it, then I don't see it really being an impact when it comes to the kids moving on to the next level. Because, as I said, I could have player safety meetings till I'm blue in the face. I'm not at those guy’s practices, so I don't actually know what they're doing or how they're doing it.

As he continued, without regulation coaches are liable to continue teaching tackling the way they are used to—which is typically the method of tackling that they were taught when they played football—instead of adapting to the Heads Up Tackling techniques.

> The tendency is to do things the way that your coach did it with you, because that's what you know… So again, as long as it's something that's not actually mandatory and that there's a national standard—a national governing body that's saying here's the way that it must be done, everyone is just pretty much going to do what they're comfortable with. Some will try it, and be happy with it, and keep pushing it. And others will be, 'Okay, I tried it. I don't think so; I'm just going to go back to the way that I used to do it.' There's nothing that's in place to prevent them from going back to the old way, except for a referee throwing a flag in a game. At that point it's already too late.

Multiple coaches echoed this sentiment that regulation is needed at the national level. The previous quote highlights the unfortunate consequences of not having any type of regulation to prevent coaches from reverting back to their old methods of tackling. Which can be dangerous if their old methods were to teach unsafe, improper head first tackling. And one coach noted that his league had taken steps to enact game rules to aide in enforcement of these techniques: "And it's a penalty in our league. If you lead with your head in the league, then you get a big flag. So there's also league rule implementations, that is specifically [inaudible] for player safety."

Characteristics of the Innovation

The intended focus of this study was the tackling aspect of the Heads Up program as the innovation of interest, but interviews indicated that participants thought of the program in terms of the entire Heads Up Football training. USA Football's Heads Up Football program is not distinctly a tackling initiative, but also incorporates elements of concussion management, heat awareness and practice structure, which were important to the adoption process. Despite the required Heads Up certification among nine of the

coaches, interviews detailed perceived benefits and challenges related to Rogers' five key innovation attributes, for both the certification and implementation of the Heads Up program.

Relative Advantage. Coaches mentioned several advantages that Heads Up Tackling, as well as other elements of the Heads Up program, offer coaches. These responses centered around Heads Up offering (1) a systematic method and compilation of resources to teach proper tackling; (2) a safer approach to playing youth football; (3) a more effective tackling technique; and (4) reassurance to parents of youth football players.

Interviews revealed a prevalent notion that Heads Up Tackling is not necessarily a new tackling innovation. Rather, "fundamental tackling" as it was termed by several participants has always been the same. As one participant described, the Heads Up program is "teaching fundamentals that I was taught as a young child, you know. I fortunately, you know, had good coaches growing up who taught me how to tackle safely and correctly. And I think that it's just reinforcing things that hopefully most people have been taught their whole life." Although participants recognized that some coaches did teach to tackle head first, they maintained that a proper, fundamental, tackle is not much different from a Heads Up tackle. And as this participant emphasized, players who were taught properly would not have been taught to use their heads to tackle.

The Heads Up Tackling program provides a type of tackling textbook or guidebook for coaches through: consistent terminology and techniques, developmental drills, and step-by-step instructions for how to teach good, solid tackling skills. Essentially it provides a foundation that helps coaches become better coaches and players

become better tacklers. This is especially useful for coaches who were not taught proper tackling as players, and thus were teaching properly as coaches. As one coach explained, prior to Heads Up there was no uniform method of teaching tackling; some coaches encouraged using your head in the tackle, while others taught similar techniques to Heads Up. He indicated that prior to Heads Up Tackling, teaching tackling,

> wasn't systematic. It was coach by coach. From a player perspective, it didn't seem like there was a lot of uniformity in terms of educating coaches about how to do it. I had one or two coaches who would try to encourage you to kind of use your head as a bludgeon and spear, although that was actually against the rules and it has been for a long time. But, you know, other coaches who basically taught what we're taught now in Heads Up, although we didn't use the same terminology.

With widespread diffusion of Heads Up, this consistency will be beneficial for athletes as they move up to higher levels of play.

> I think we have, for the first time in really football's history, a comprehensive means by which we can teach tackling and blocking to kids. It's the same terminology it's the same technique that kids will learn in elementary school, high school, college and beyond. And for the first time there's a continuous method and we have a million kids—and I think it's about five thousand parks around the country that are subscribing to the Heads Up Football program… So it's consistent not just from team to team but from grade to grade. And, you know, I can have a kid that's a sixth grader and by the time—or a six year old—and he's going to be the same tackling drills, same terminology at 10 and 15, and if he goes on and becomes 20, and it's a safer way to play the game.

Several coaches also highlighted the useful resources, such as tackling and blocking drills, and step-by-step proper tackling protocol they received access to from the training.

> …the drills that they suggest use a real step-by-step approach, and every step is important in becoming a tackler. And me playing football my whole life and having good coaching, I knew all the drills, but was reminded of some things, you know, that I could do better and do differently. And you know it just, to me, it gives the kids the proper steps and the time, through the half-speed stuff and through the tackling dummies to see what proper tackling feels like, and to experience it step-by-step until they can gain confidence and be able to actually do it properly themselves.

These resources were seen as especially beneficial for new coaches. As explained by a participant, many coaches are volunteers and have no previous coaching experience:

> You know, you have a lot of dad coaches—as far as recreation, if you talking about recreation—you have a lot of dad coaches coming in because their kids wants to start playing football. They might have never played football. They might have saw on television—sometimes, on television, I watch on the college and the NFL level, it's a lot of bad tackling. It's not correct tackling they're teaching at all. So they need that kind of teaching to keep the coaches pretty much abreast of what's going on.

Further, multiple coaches referenced how Heads Up developmental drills allow coaches to devote time to cultivate their players and develop a solid tackling foundation and technique. One coach gave an example of how Heads Up changed his player development strategy, and ultimately enabled him to guide and develop a player, who initially was not very good, into a starting quarterback and great tackler. He perceived this was possible because he implemented the Heads Up program.

> Specifically, this year, one of the best tacklers on my team was a first year player, who the first day he came out was even scared to hit the tackling dummy. Was very, you know, he looked intimated to be out there, like he wasn't going to enjoy football at all. And after just giving him a chance to slowly go through the drills and encouraging him of the few things he did right, he slowly gained confidence and honestly now the kid's my starting quarterback and one of the better tacklers on my team. And to me the difference between a kid like that, maybe five years ago, and a kid today—he just, even me personally, five years ago would probably not have given him the time to develop.

Another perceived benefit of using Heads Up Tackling techniques, among all of the coaches, is that it improves player safety. With the absence of a consistent tool for teaching tackling, not all coaches were teaching safe, proper tackling skills. However, Heads Up impacts safety of athletes by, "taking kids' heads out of the tackle and… out of harm's way," which is particularly useful in assisting coaches who were taught to tackle with their heads and were not aware of the dangers of tackling with your helmet:

> I first played back in the 80s, and even when I played in high school, it was more of a, we basically used our helmet as a weapon… Leaning in, I would use my facemask, and that was the first thing that would hit you. Because I believed it would hurt you the most, if I hit you with my head first. Heads Up Tackling tells you, 'Hey, that is illegal. You don't do it. It's dangerous. You use your shoulder and your shoulder pads to tackle.' Your head should never make contact or be used as a weapon. And I feel like the people who are always considered the best hitters and the best tacklers they always use their helmet. And that's something that I believe that coaches are actually looking out for also being dangerous—kids using their helmet as the primary thing to tackle with.

Along with reducing risk of concussions, coaches felt like the Heads Up certification course improved their knowledge and awareness of the signs and symptoms of concussions. As commented by a participant,

> As far as those that acquire it and take it seriously, they can learn a lot. I mean I learned a lot about concussion, concussion awareness, at my first USA Football conference. So, I learned things that I wasn't aware of that happened, as a younger coach some kids I'd coached, it'd happened to me when I was younger, you know, signs of concussions that I'd overlooked.

Several coaches also posited that Heads Up Tackling is not only a safer technique, but it is also a more effective method of tackling than "using your head to spear the opponent" —as some coaches taught. A description given by one participant was,

> Basically the Heads Up tackle it starts with a power step from the lower— from the foot, so like any good tackle it all starts with the leg muscles. You want to make sure that your chin is down below pad level. Heads up, literally. So eyes up, that's you know, the way we teach it is you can't see what you can't hit, so you have to keep your eyes up. So turn your head away from the tackle, and then use your shoulder and a wrap and then a roll, to use your leverage to take the kid down. And that's— a good coach would've taught you that before the Heads Up program, anyway. Because that's just a more effective way of tackling than just running crazy at a guy with your head down.

And as another coach pointed out, advertising the programs to coaches this way may incite more support for the program.

> Even if you're just talking about playing the game, it's a better way to play the game. Period. Even if safety's set aside. Of course it's not, but they're usually better ways to tackle. If you lead with your head, you're usually not wrapping up

> appropriately, and it's just not a good way to tackle anyway. You don't know— You can't see the player you're trying to hit and tackle, and they can get around you quite easily because of that. So, I think that, so it's easy to coach— I guess my point with all that, usually you get a lot of buy in from other coaches when you can sell it that way. In addition to safety.

Heads Up certification also reassures parents that youth football is safer. Given the decline in youth football participation, mentioned earlier, this was seen as an important benefit:

> I think one of the other benefits that I mentioned earlier is it gives you a way of reassuring parents that this great game, that you know a lot of us came up and play, and most of us never had a problem with concussions and other sorts of injuries, is actually as safe as we say it is. You know, here is what we're doing to make sure that your kids are going to be safe. It gives you something to point to when you get questions like that.

Even the one non-certified coach, indicated this as one of the reasons he would get the Heads Up certification. In response to a question about why he was considering getting certified, he stated,

> You want to have the knowledge. So if a parent leave their kid with you, they can feel good that the coach is knowledgeable of what he's doing and what he's talking about. And teaching the kids correctly. So if you go to certain clinics and they offer the correct way of teaching, and you're aware of what kind of teaching that coach is getting, you'll feel more comfortable with your child or kid playing under that coach leadership.

However, one coach admitted that it is still the confirmatory phase of determining if the Heads Up program is really assuring parents that youth football is safer. Only time will tell if it has, indeed, had this desired effect.

> I think there's really two true ways of looking at it. Heads Up is designed, obviously, to teach a better way to tackle and keep kids safe, but it's also in part a program designed to reassure parents and reassure people that football's a safe game. So I think in terms of the former, coaching technique and that sort of thing, it's definitely accomplishing its goals. In terms of the latter, I think we're in a wait-and-see period.

Compatibility. Several characteristics were found to influence the compatibility of Heads Up with youth football coaches' practices and values. These included; the way they were teaching tackling prior to Heads Up, the way they were taught to tackle as players, years of coaching experience, focus of the coach, and perceptions of how Heads Up changes the game of football.

Many coaches explained that incorporating Heads Up into their coaching style was not an issue for them, because they had been teaching similar techniques prior to getting certified. As stated by one participant, "I don't know if, me personally, some of my tackling techniques were wrong or any different than Heads Up teaches. I always taught head to the side, head out in front." Rather, for several of these coaches Heads Up just gives access to several developmental drills that coaches can also use as resource—but does not change their technique itself. One coach supported this saying, "To me, what Heads Up has done differently is more developmental drills. And that's the only thing I've changed. Before Heads Up I taught the skills the same way, I just didn't know or have as many drills to be able to develop the skills."

The non-certified coach expressed similar sentiments about Heads Up-type tackling techniques already being his method of choice. He also voiced confusion at all of the attention concussions have been getting, especially at the youth level, because he has never taught athletes to tackle with their heads, and does not understand why at the higher levels they do:

> I guess to me it's like—and to some other youth coaches—it's like they making concussion a big deal and I'm probably sure it is, don't get me wrong, but in little league sports we don't really deal with too many concussions. We deal with maybe a broke [sic] arm or a broke leg, a sprained wrist, ankle, stuff like that. We deal with that more than we'll deal with a concussion. Because I believe what we do, we teach kids basically how to fundamental tackle. I see the older guys, high

> school and college guys—a lot of sometimes just lead with their heads, or just throw their shoulder… We don't teach kids to tackle with your head, or head-to-head contact… And that's why it's so odd to us that we're seeing more concussions, because we don't teach it in the lower level, and high school and college level, they shouldn't be teaching it either.

Due to the inconsistency in how tackling techniques are typically taught, for coaches like him, who have never taught their players to tackle using their heads, the attention and research on the rising incidence of concussions in the sport is surprising. However, as he notes these rising statistics likely reflect the improper tackling methods used by some players in the higher levels of the game.

Multiple coaches also found the Heads Up Tackling techniques compatible with their coaching style because they had been taught proper tackling techniques when they were football players, which, for many of them, was the reason they were already teaching similar strategies to Heads Up prior to getting certified. One coach gave the following explanation for his approach:

> I guess because once I got in college, the Heads Up program I don't think was around like that yet, but I still had coaches that had common sense and said, 'Hey, stop using your head. This is how you tackle.' And then I just sort of used common sense… So I said hey, our head coach used to tell me not to duck my head, so I'm trying it also. So common sense tells me I'm teaching kids now, let me teach them the proper way to tackle. So it was an easy transition for me.

Coaches who were rigid in their thinking and averse to change, in regard to the way the game is played, were perceived as resistant to adopting Heads Up Tackling methods. Many coaches were cognizant of the fact that, by nature, football is a relatively violent sport. Consequently, "old timers," as denoted by some participants, do not like the Heads Up program because,

> They're reluctant to change. This is— You know, football's , you know, that's the 'tough guy' sport, and this is how I did it when I was a kid… And they teach what they know, and it's tough to convince them that the game that they grew up, and

> the game that they know so well, you know, they have to teach it differently. It's advancing. So it's just people stuck in the mud.

Especially, for coaches who are "used to coaching football—being a successful coach—you don't see it as it's time to change." One coach stated that he decided to implement the Heads Up Tackling techniques because the program was compatible with the skills of his players. But he insisted that if it had not worked, he would have returned to teaching it the old way.

> *Interviewer: And what do you think differentiates the coaches that did use it versus the coaches that did not use it?*
>
> I think it's a matter of choice. Some people are comfortable with the way that they learned how to do something, because you can't teach them unless you know it. My opinion, since that's the way they were taught, basically that's the same way they will relay the information to the kids that they have now. Me, I'm kind of one of the older guys, but I also don't mind trying anything once. So, if it works for me and I try it, then I'll go with it. By the same token, if it wasn't and the old way was working, I would now being going with that. But my kids adapted to it. They learned it.

As this quote illustrates, compatibility is important not only from the coaches' perspective, but also from the players. Since the athletes are the individuals responsible for implementing the technique, having a program that was compatible with his football players was influential in his decision to use the Heads Up technique.

The coach, who had the least amount of coaching experience, pointed out that it is fairly easy for new coaches to fully adopt Heads Up because they are coming in without bad habits or an old way of doing things that they are unwilling to give up.

> So for us who have been doing it four or five years, as opposed to thirty or forty years, it's a lot easier, because, again, we don't come in with bad habits. And it's easier for us to structure our practices using these new time limits, than it is for a guy who may have been coaching before— even before the 80s— something like that.

The focus of the coach was also perceived as relevant to whether or not they would be receptive to the Heads Up program. Coaches who are focused on player safety were considered more supportive of the program than coaches whose focus is on winning. As noted by one participant, these coaches are not necessarily callous and wanting their players to get hurt, but, sometimes, they get so invested in the game that winning becomes the principle focus.

> When you're getting so involved in the game that the game itself, and the outcome of the game, becomes the number one priority, then a variety of issues can happen. Safety being, you know, whatever. Not because they're trying to put people in harm's way, it's because they may not at the moment be thinking very clearly about negative consequences and so forth.

Conversely, some coaches recognize that the safety of the players is paramount. A number of coaches were aware that many youth football players will not go on to play after middle school. As one coach relayed, the game is intense and there are risks associated with playing football, but the goal is to minimize these risks while they are playing the sport so that young football players can enjoy the benefits of playing football.

> …we try to teach them to play the game as safely as possible. That's the major emphasis we have. Just because I love the game and I think it's a great game, and it teaches kids a lot. But it's not worth them— most of these kids aren't going to play in college, professionally— it's not worth hurting them in a way that'll compromise their ability to do what they're actually going to do the rest of their life. The goal is, for me at least, to build a community. Our team is an outreach to a very rich-poor part of the city, where these kids—We feel like it provides them with some structure, and opportunity to learn how to set goals and work hard on those goals… They can be taught to you in a lot of different venues, but I think football is unique in kind of assimilating a lot of those skills… But we want to emphasize the positive and focus on the positives and minimize the negative.

Complexity. Participants identified several challenges to getting certified as well as implementing the Heads Up techniques. Coaches commented on the time and costs necessary to complete the Heads Up certification. As highlighted earlier, there is

significant variability in terms of what coaches pay to get certified. Therefore, for some coaches, money may serve as a substantial barrier. Illustrated by one participant, often times there are other costs associated with becoming a youth football coach, and Heads Up certification just adds to their already mounting expenses:

> We always make jokes about, that we tell our parents, you know sometimes the parents will get caught up in the team and telling coaches well why aren't we doing this and why aren't we doing that, sometimes they forget that we're volunteers, and we tell them we don't get paid for this, but also we pay to coach for free. So USA Football, and to get Heads Up certified, we pay 25 bucks…Then we pay for our— That on top of paying for your shirts and then we have to get certified with our league, which is another 15 or 20 dollars. We usually end up paying about 85 dollars to volunteer coach for free. Them charging us to get Heads Up certified, that doesn't help.

As a result, some coaches and/or programs may not think it is worth the trouble.

> So it'd be different for a park director to say, 'Hey, we're [not] doing that this year, because our coaches can't afford that.' Or to say 'Hey, well, these three coaches—well there's nobody really checking. Well, the head coach is certified while the rest of you guys, fine, it's cool, just go ahead and coach.' Because that is a price— I mean 'cause I've had coaches that I've had to pay for myself, for them to take the class and for them to even find a coaching shirt.

In addition to costs, the certification requires time. Most coaches estimated that it takes around two to three hours to complete the certification videos. With many coaches being volunteers, some coaches do not have the time devote to completing the process.

> And usually it takes about two to three hours to do the entire class. So we're trying to find two or three hours to do it. While you at work? Then you have football, because usually you're doing it around football season. So usually you're already having practice and you're already at work. Then when you get home it's like 9, 9:30. You have a family, so it takes a lot of people's time. My coaches always say, 'Hey coach, I'm trying to find time to do it.' 'I'll try to find time to do it late tonight.' And we're up until midnight trying to take a Heads Up certification test.

The one participant who was not Heads Up certified indicated that he had received an invitation to participate in an in-person Heads Up certification training. However, he was unable to attend, explaining, "They have classes offered in different states. Well I was

supposed to went to one this past summer, but my schedule was so busy that I couldn't make it."

Additionally, youth football organizations may not want to overwhelm their coaches by adding something else for them to do. This was the experience of one coach, who explained that his proposal to require Heads Up was denied by his previous park because "that's just an extra hurdle that we're going to make these volunteer coaches jump through, in order to work with these kids. And the job is kind of hard enough, and we shouldn't add this extra barrier."

Several challenges to implementing Heads Up emerged from the interviews, including; differential player and coach implementation, parental interference, game pace, and limited practice time. Although coaches are among the primary decision makers in the initial adoption process of certification, players are critical to successful implementation of the program. Several issues with player execution were noted. Coaches commonly expressed that, at the end of the day, they cannot control what their athletes do on the field. They can teach all of the Heads Up Tackling techniques, but "can't put a robotic suit on and prevent them from doing certain things." As reiterated by one participant, young players may feel somewhat invincible because they have a helmet on, and coaches can only explain to them what they did wrong, in order to prevent it in the future.

> I mean kids will do what they do. My own son is probably the worst one, actually. He leads with his head, and frankly I pull him out of the game if he does it. And tell him you're not going back in there. They're not trying to be obstinate, they just, I don't know why, they just— I think they have this big piece of plastic on their heads and they feel like it's like a… ram, and they feel like they can lead and hit somebody that way. And so, in the middle of a game, I can't control how they do it. All I can do is try to teach them, "Hey, you don't do it that way."

Multiple coaches had experiences where players forgot the techniques during games.

> And you can go back, you can review and let 'em hit the dummies, and some of them will do it right as long as they're against the tackling dummy, but as soon as they get against another person, they, you know, just forget everything about it because they're scared and they don't like the contact, and they don't run away.

Another coach supported this notion of differences between game and practice execution of Heads Up Tackling techniques. Specifically, he addressed the control and pace that practice allows, but is not characteristic of game play:

> When you do it in practice, it's pretty much all simulation, right? So it's a very controlled environment. And you're teaching both kids to do it a certain way, and like I said it's very controlled. It's not game speed. You're not bringing anybody to the ground. The kids are close together.

However, when kids are in a game setting, they are mostly focused on winning, at times at the expense of applying correct Heads Up Tackling.

> So when you've got a kid running full speed at you, the kids turn to pretty much— again they try their best— but you get run over a couple of times, the third time you try and do something different. I'm not out there playing for them, so it's basically, I'm tired of being run over by this one kid, so now I'm going to try something different. So, that's where there's a disconnect between game and practice. Because it's not controlled anymore, it's full speed, it's live action, and your objective is to stop the guy from scoring. They do whatever they can to get it done.

Participants expressed differing views about the complexity age of the players adds to trying to implement Heads Up. For some coaches, having young players was perceived to make implementation easier because these athletes are "blank slates," and therefore do not have the bad habits that older players have.

> Again, I got to my kids pretty young. Right? So, they didn't know anything about football. So, if that's the only way they were taught, that's the only way they're going to know. See I had a blank slate. You know, I had a blank canvas to work with, so it was a lot easier to start from there then it is from a kid that's already 10, 11, 12 that's been playing for 4 years— to now come in, well this is the way that it's done. It's gonna be tough to get that kid's mind out of— not to say that it can't

> be done—but it'll be a tougher road to travel, from the coach to the player, to buy into the new way.

Yet, other coaches indicated that techniques are more difficult to implement with their younger players, because it may be too complex for them to follow all of the fine details. One coach with experience coaching both middle school and younger football players observed this distinction stating,

> I have a very young group this year, so I've noticed it's kind of half and half. Some of them are very— because we're molding them—when they do make a tackle it is exactly what you want. I don't see a lot of bad technique. But being that I have very young kids, a lot of them do just instinctively stick their head down and go. So we really pounce on that when they do it.
>
> *Interviewer: Since you've coached from 5 to 12, do you see a difference between the older kids?*
>
> Oh, absolutely.
>
> *Interviewer: Which ones are better at following the technique?*
>
> Older kids are, because you can teach them the finer points of it. Where the younger kids, 5, 6, sometimes 7, they're more most of the time really just knocking each other down. Where, with older kids you can teach them hand placement, proper footwork, proper pad level, lowering their hips, exploding with their legs. You can teach them those things and it can become second nature. Where, with younger kids it may— it's a little uh too in-depth, I guess you'd say.

Coaches also cited the limited practice time available as a challenge to teaching the Heads Up techniques. Several coaches indicated that one of their goals is to make the techniques automatic, so players do not forget and resort to bad technique during games. A coach affirmed, "if we had a little bit more time to do it— again it's all about muscle memory— I think the kids would probably get into it and adapt to it." And some kids require more time and attention for this to happen,

> We'll go through it for about 15 to 20 minutes, and after that we have to move on. So, again, it's the lack of time. You hope that the kids get it. Those that don't, you try to spend a little extra time with them next week. But within that week, when

> you're trying to prepare for a game, it's hard to go back, because we only have so much time. These are kids; they go to school the next day; you can't keep them out too late. A lot of it— We try our best.

The lack of league-wide implementation or oversight also poses several challenges for coaches. While all of the coaches identified improvements to player safety as an advantage of using Heads Up Tackling, four participants expressed concerns about their players' safety when they are playing teams that are not using the techniques. One of these coaches commented,

> And the problem with teaching Heads Up Football to my team is, okay, if I'm teaching Heads Up Football, which has certain techniques. If I go and teach it to my team and then we go and play another team, but their coach is not teaching Heads up Football, and they're lowering their heads and they're spearing, and using their head as a— their helmet as a weapon, and there's no rules in place to say that they can't do it, then my kids are at a disadvantage and my kids can potentially get hurt.

In one instance a coach recalled one of his players who suffered a severe concussion because he was using the correct technique, but the opposing player was not and "they were actually targeting his head."

Parental interference was specified as a difficulty coaches face when attempting to apply Heads Up— particularly the concussion protocol. A few coaches suggested that some parents put pressure on coaches to keep their kids in the game even if they get injured. For example, with one saying,

> Sometimes you're viewed [by parents] on how much you win or lose, and if you losing two or three games in row, because your star player's sitting out because he didn't pass concussion protocol, and parents are coming out on you, and other people coming out on you… That's stressful sometimes.

Additionally, one participant was adamant that while Heads Up is overall a good program that improves player safety, there are some limitations of the program that impact the effectiveness of execution. Specifically, he voiced issues with the nature of the tackling

techniques only addressing the defensive side of the game. That leaves him with nothing to use as a guide and his offensive players at a disadvantage. He said,

> When you talk Heads Up, you're only talking the way to tackle someone. You're not talking about on the opposite side, you know, changing the way that you run the ball or changing the way that, when impact is imminent as an offensive player, should you do something different. They're still being taught the old way, which is pretty much lower your shoulder and ram it into the person's chest. So that way they don't get a good angle to tackle you. So, if you gonna teach it and say Heads Up is safer for the tackler, then you have to turn around and say, hey, we have to teach how to do it different on offense, as well. Because, unfortunately, me being a head coach, I'm still teaching my offensive guys to do the same thing that they've been doing, because there is no standard as to this is changing, this is the new way of doing things. It's just the old fashioned way. And if you see somebody coming up to you and you don't have nowhere else to go, it's to try to run them over. And if your defense is taught Heads Up Tackling, that kid, to me, is at a disadvantage. Because the minute he tries to do the technique that he was taught, he's going to get run over. He may not get hurt, he may keep his head up, but he's going to be laying on his back while the other kid is running down the sideline.

With some coaches focused on outcomes, the notion that this technique may limit effectiveness, despite still being safer, may be a deterrent for coach adoption.

Observability. Some of the persuasion aspect of the Heads Up program may come from the visibility of similar strategies being successful in the NFL. Four coaches mentioned a tackling technique advocated by the Seattle Seahawks, which they likened to Heads Up Tackling in its efforts to take the head out of the tackle. One coach pointed to the successful use of this technique by the Seahawks as evidence that Heads Up does not change the culture of football, despite some people's concerns.

> From the inside looking out, I can tell you that this [Heads Up] is just a more effective way of tackling. If you watch people in the NFL, the Seahawks— one of the best defenses in the league— they use this tackling technique. They call it a hawk tackle and it's basically a rugby tackle where you don't use your head. It's hard to argue that those Seahawk defenders aren't tough guys or are playing the game wrong. So, from my perspective, being a coach and being involved in the sport, I don't think it has changed the culture.

Coaches also highlighted a notable decline in injuries as evidence of the effectiveness of the techniques:

> I mean I think all the kids, if you teach the correct technique, you're gonna see the results. As far as a specific example, I really can't think of one. I mean my team has always been pretty good with tackling. The parents see it and our coaches always see it. I haven't had any kid, luckily, get hurt like that, from ducking their heads and things of that sort, all because we emphasize that. And I think that those results show, a lot, if you aren't having a lot of injuries to the head, and back, and neck area.

Overall, all of the coaches saw signs at some point of their players implementing the Heads Up Tackling techniques. As exemplified by one coach's experience:

> I personally have seen improvements in kids that are doing it the right way, even when they are full speed trying to win the game, because they have done the drills so often and because we practice tackling correctly so much, rather than on that game-breaking play, where your kid has to knock the other kids out of bounds, you know. In the past I've seen some kids just launch them— kids just launch themselves at a kid to knock 'em out of bounds. And now I'm seeing more and more of kids doing it the fundamental and right way, and making contact with their shoulder and in a good position.

Another coach gave an example of his athletes using Heads Up Tackling in the heat of competition,

> We were playing on defense, the opposing team had a player get around the edge on a sweep and was running down the sidelines to score. And my player went over to the sidelines, you know, was chasing the kid down to make the tackle and he made a great fundamental hit that was, it was—everybody in the stands went, 'ooh ahh,' and it was a great hit and all that but, you know, both kids got up just fine, you know. What I'm saying, so it wasn't—he didn't kill the other kid, he did it the way he was taught, and because of that, even though it was a great hit, both kids were able to, you know, my kid helped the other kid up. You could tell the other kid kind of nodded at him and said, "good hit," and they were able to keep playing.

The visibility of widespread implementation of the tackling techniques is not always clear. Several coaches commented that it is often difficult to know if other players are implementing Heads Up. As one coach described, coaches cannot really know for sure

that other teams and coaches are teaching Heads Up because they are not at their practice—and good technique does not necessarily equate to Heads Up Tackling.

> Sometimes I do see a tackle being made, and it's a perfect technique— everything that I've seen, that I've learned about Heads Up Tackling, and you wonder if it's because that's how it's being taught or did he just get lucky on that play. You know what I mean? It's hard to gauge without actually being at people's practices, and seeing how they work and what they're doing with these kids. Again, game time is fast, it's a lot faster than practice, it's full speed, it's live.

Use of the concussion protocol outlined in the Heads Up certification course was commonly mentioned as something that has been particularly visible.

> So, you have to go through that class on the video to look for signs and symptoms, and they teach you the proper protocol of a concussion… And they have to sit out the rest of the game, if you have even a suspicion of a concussion or you think something has happened, or some kind of head injury has happened. Then they have to go to the doctor, and they have to be actually cleared by a medical physician, and bring you a note, before they can participate sports again. And that's something that, that's one protocol that I do believe coaches are actually doing now. Because I've see it happen a couple of times, where I really think coaches are actually following that criteria, which I think is good. And I think that was something that was actually brought to the attention of coaches by Heads Up Football.

Trialability. The majority of the coaches interviewed were unable to try the Heads Up program before getting certified. However, one coach who was a big supporter of the Heads Up program and attempted to convince his previous league to mandate it, had an opportunity to try it. He explained that he was exposed to Heads Up before getting certified through an Atlanta Falcons Youth Football camp that he attended, where they were teaching kids using the Heads Up Tackling techniques:

> Well I actually was aware of Heads Up before I was required to be Heads Up certified. I actually do some work with a non-profit organization that's involved— well it was founded by a former NFL linebacker— and we do a lot of football camps with the NFL and Play 60. And the NFL is obviously involved in the Heads Up program, so through those camps we were required to teach the Heads Up Tackling techniques, anyway. So even before I was required to certify in order

> to coach, I was familiar with the program and already used those techniques in working with kids.

Two other coaches participated in in-person Heads Up certifications, instead of the online certification. Although, they had already committed to the certification at that point, they were still able to try the tackling techniques out themselves before implementing them it with their players. One gave the following description of his experience:

> See I'm the safety coordinator, so you go to a in-person seminar training. And a lot of the time that's run by either one of the Heads Up certified people nationally, maybe an NFL coach, maybe some high school coaches, NFL personnel. They kind of wanted to go across the country teaching seminars. And everybody that goes to those sessions, they also teach you how to— you also get the helmets, try on the gear, you go outside on the football field, do drills ourselves. You got a whole bunch of coaches, in shape, out of shape, old, young, doing what we teach our players. It's pretty fun. Pretty competitive, pretty fun.

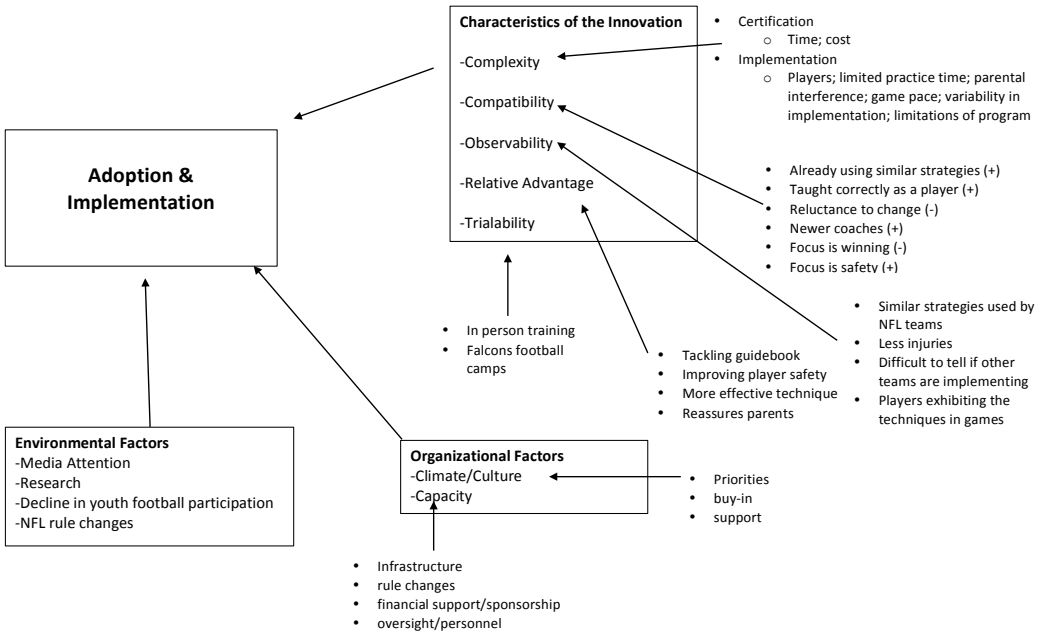

Figure 2: Model of Innovation-Decision Process of Heads Up Football Adoption and Implementation. (+) refer to facilitating factors; (-) refer to deterring factors.

Implementation of the Heads Up Program Elements

Throughout the interviews coaches discussed and gave examples of how they have integrated Heads Up in their coaching style and practice. Participants incorporated the Heads Up program primarily by teaching the tackling drills, organization of their practices, use of the concussion guidelines, and "Mom's clinics."

Tackling Drills. All the coaches used the Heads Up tackling, blocking, and developmental drills to some extent. Therefore, Heads Up Tackling techniques were often stressed in practices, and formed the basis of how they taught tackling form and skills—particularly as they, relate to head placement during the tackle.

> Well what we do is, for our particular league, we actually, after they're certified, we have the kids, when they first come out, the coaches who were heads up certified, put all the kids together. You know, we're training the kids on the drills, where we make sure they know how to stop and think, how to sink, how to keep their heads up. It's a progression; you go through each stage of the [tackle]. Then you have four or five lines, where kids come up, you know, 'stop, sink,' we're saying out loud. The kids, they go through the motions and you teach them. And it's fun. We're putting that in early, in the very beginning, before the pads are on, before we've had any equipment on, we're going through the drills of how to tackle.

And according to several coaches, they immediately remove players who do not follow the techniques during games. As emphasized by one of the coaches who commented, "I can't put a robotic suit on and prevent them from doing certain things. That's one of the unfortunate risk factors of that. But if there's any issues at all, we immediately pull them out and don't let them play."

As discussed earlier, because of the way the Heads Up Football program teaches the tackling techniques, there is a consistent terminology promoted by the program. Therefore, several of the coaches indicated incorporating the language of the program

into their coaching style. For example one coach described the vocabulary transition saying, “it's rip versus like saying “wrap 'em up,” now it's rip instead of wrap the kid.”

Further, just from participants’ examples and descriptions, sayings similar to, “keep your head up!” or “head to the side!” were consistently communicated in the interviews. This was exemplified by one coach who was describing the notable change in what hears as he walks by youth football practice field: “And I do believe more and more coaches— I hear when I'm walking to practice, and I'm walking by other practice fields, I do hear the coaches, more coaches, say, “hey, keep your head up!” “hey, don't lead with your head.” When probably 10 years ago, you would've never heard that.”

Additionally, some of the coaches mentioned setting aside practice time specifically for teaching the Heads Up Tackling drills. One coach said that defensive days are devoted to drills, techniques, and footwork, and they typically allot 15-20 minutes for Heads Up techniques specifically. Another coach underscored that park policy mandates that he “spend the first ten minutes in every single practice teaching technique—teaching Heads Up Tackling and blocking techniques.”

Despite prevalent use of the Heads Up drills as teaching tools among the participants, one coach was more favorable to using the drills provided by the Seahawks tackling videos but found the other elements of the Heads Up program more useful:

> I really have taken to some of the practices that the Seattle Seahawks use with their tackling techniques. More of the rugby style tackling videos that they've produced. Coach Carroll. So that's really been more of on the field, what I've taken more away from that, instead of Heads Up. But as far as Heads Up, it has made me more aware of the physical dangers of injuries, and signs of concussions. Made me more aware of heat issues. I really emphasize water breaks now.

Practice Structure. Many coaches restructured their practices in response to their Heads Up certification. Notable changes were limiting contact time in practice and inclusion of more water breaks. As discussed by a participant, since Heads Up "we're limiting contact in practice, you know, so I think mostly it's making it safer. We're not out there hitting even three days a week, two hours a day. We only hit one day a week. It's definitely made it safer, so it's not as much contact."

Further, lessons on the impact of fatigue on player safety covered by the Heads Up certification was influential in increasing the frequency of water breaks coaches structure into their practice, and ensuring that water is available at each station when they are doing drills. As one coach admitted, "before I got involved with Heads Up, I don't think I was actively making sure that there was water at every station, during every practice, at all times. Now, we do stations—we do drills, [and] at every station there is their water bottle."

Concussion Protocol. Coaches also commonly mentioned incorporating the concussion guidelines outlined in the Heads Up training. Particularly in games, athletes suspected of receiving a concussion were immediately taken out of the game. An example given by one of the Athletic Directors highlighted the prioritization of concussion management over winning games, exemplified by him and his colleagues:

> We had a— our second grade team was in the playoffs, and it was a very very close game, and their quarterback made a hit. And he's walking off kind of dizzy and he sits down and he tries to go back in the game, and the coach says, 'Nope', he takes his helmet away from him. And he's the star player, and you know, he sees him wobbling and he says, 'you know what, I'm not going to risk you for a game right now, getting injured.' So we actually took the helmet away from him, and he understood, eventually, but he wanted to go back in the game. After that, the whole next week— they won the game— they did the whole concussion protocol and he was not eligible to play for the next game.

Mom's Clinics. Interestingly, three coaches referenced implementing a football clinic for parents, mainly moms, to increase awareness and encourage buy-in from parents for the program. The parents are able to go through the Heads Up drills themselves.

> We advertise that we're Heads Up certified, and we bring the moms, or parents. I say parents, but mostly it's mothers, come in to show them— we have a football 101 for the parents. We walk them— We actually show them the [drills] we're doing. We go through having them try our equipment on. Show them how to measure it, how to put the helmets on properly, and we make it all—you know, we're answering questions. We have, like, a little seminar. And you get the parents involved, so, 'Okay, well, it's not as bad as I thought.'

The experiences of these participants highlight that Heads Up is being implemented in a variety of ways, outside of just teaching the tackling drills. Nevertheless, the degree and scope of Heads Up implementation is influenced by, organizational resources and culture, innovation characteristics, and the changing environmental climate surrounding the game of football. A model summarizing the findings on the factors the influence adoption-decision process of Heads Up Tackling is shown in Figure 2.

CHAPTER V

Discussion

The purpose of this study was to explore adoption and implementation of USA Football's Heads Up Football tackling initiative among Atlanta area youth football coaches. Findings indicate that the current attention and changes taking place in football at all levels, along with youth football organizational factors, and the advantages and compatibility of the Heads Up program with these changes and the values of youth coaches themselves, are integral to the diffusion process. All of these factors influence the adoption and implementation decisions of youth football coaches.

Adoption

Interviews with nine Heads Up certified youth football coaches revealed that Heads Up certification was only the first step of the adoption process. Coaches can receive the certification and not apply the tackling techniques and drills discussed in the training. Therefore full adoption the Heads Up program includes: (1) participating in the online or in-person certification, and (2) teaching the tackling techniques to the players. Additionally, because the Heads Up Tackling initiative is focused on player safety and protecting athletes from head injuries, coaches found the concussion and heat exhaustion awareness and management training, included in the certification course, to be important to the adoption-decision process as well.

Findings from the ten interviews supported the postulation that the DOI *Persuasion* constructs (e.g., complexity, compatibility, observability, relative advantage) influence the adoption-decision process of youth football coaches regarding use of USA Football's Heads Up Tackling techniques. As outlined in DOI theory, advantages of

Heads Up Tackling over head-on contact and traditional methods of teaching tackling were motivators to fully adopt the Heads Up Tackling training. Overall, there was a consistent theme through many of the interviews that Heads Up provides a standardization of the coaching process for teaching athletes how to properly tackle.

Although most coaches reiterated that a proper tackle pre-Heads Up was not much different from a Heads Up tackle, there was no consistency in the way that coaches were teaching tackling techniques. Therefore, although many of the coaches in this study reported that they had not been taught to use their heads to tackle, when they were players, they were aware that this was their own experience; not every coach teaches proper tackling. Thus, Heads Up is a good resource for coaches who are teaching their players to use their heads, or newer coaches who are in need of some guidance in teaching tackling. Furthermore, not only is Heads Up improving player safety by ensuring that coaches equip their players with a good tackling foundation so that they are not using their heads to tackle, many of the coaches suggested that it is also a more effective way of tackling than having players use their head. Additionally, being Heads Up certified sends a message to parents about a coach, team, or leagues' commitment to player safety that can function as a public relations strategy in that it builds parental trust and buy-in. This was one of the biggest motivators to the one non-certified coach interviewed.

Discussions with the coaches suggested that compatibility of Heads Up Tackling with coaches' values and previous practices was likely the biggest motivator or deterrent for actually implementing the program and teaching the techniques learned from the certification. Many of the coaches indicated that Heads Up Tackling was similar to the

tackling techniques they were using before the certification. The participants who reported this was the case reflected that they had good coaches at some point in their own playing careers, who taught them not to use their heads to tackle. Therefore, these coaches did not have to change their coaching style much to accommodate the Heads Up program. Instead, the Heads Up program was an enhancement of, rather than a replacement for their current teaching. Through the Heads Up certification program they were able to access valuable resources and drills that could be used to teach these tackling techniques in a more systematic way, and at a pace that facilitates player development.

Since Heads Up is seen as a safety initiative, coaches and youth football programs that value player safety over a "win-at-all-cost mentality" are more likely to endorse the program. This was supported by a number of the participants who cited being in leagues or parks that heavily emphasized player safety. It was also supported by the two participants who left parks where the wellbeing of the athletes was not the main agenda, and relocated to parks that supported Heads Up and player safety initiatives. This suggests that coaches' investment in injury prevention, may be enough of a persuading factor that coaches will go out of their way to join an organizational body that endorses Heads Up. It further signifies a strong belief, among these coaches, in the efficacy of Heads Up for preventing injuries. A study of Norwegian girls' soccer coaches' attitudes towards an injury prevention intervention found that the expectation of fewer injuries was the strongest persuading factor motivating coaches to implement the training (Soligard et al., 2010).

The observability of similar tackling strategies by NFL teams also added to the credibility of the program. Coaches' references to the Seattle Seahawks' rugby-style tackling method, which emphasizes comparable techniques for keeping the player's head out of harm's way, supported this notion. Visibility of implementation of these strategies by a well known and successful professional football team serves as a persuading factor, because it reinforces the effectiveness of removing the head from the tackle, over often-used improper tackling methods such as spearing and head-on contact. Furthermore, witnessing the benefits of the program is also a major facilitator for full adoption. Coaches cited fewer injuries, player compliance, and widespread implementation of concussion protocols in games, as evidence of buy-in for the Heads Up innovation. Trialability did not seem to play a significant role in most coaches' adoption of Heads Up, as only one coach reported being able to try out the program prior to certification. However, this firsthand exposure to the program was influential in driving that coach's intent to become certified, and to advocate for his entire league to adopt it.

Barriers to Adoption

Findings from this study highlighted several barriers and complexities coaches face to getting the certification and implementing the tackling strategies. Since the majority of coaches at the youth level are volunteers, who have jobs, families, and other responsibilities, a two-and-a-half hour certification process may be hard to fit into their busy schedules. And for coaches and programs that do not have enough motivation for wanting to subscribe to Heads Up, this may be a sufficient barrier to prevent them from completing the certification. Additionally, an in-person certification process that a few of the coaches were invited or required to participate in due to their leadership positions

(e.g., Player Safety Coordinator, Athletic Director), has additional time barriers because of the required travel. This was the case for the one non-certified coach, who despite favorable views of the program, did not have time to participate in the training. Cost was also seen as a barrier to certification for some. Some programs have the resources to supplement certification costs removing this barrier, however for other programs that is not the case. Further, the accumulation of these costs, alongside the other costs associated with coaching youth football, may prevent coaches from getting certified.

The majority of the challenges to adoption of Heads Up center upon the implementation of the tackling techniques. Coaches are the decision-makers for certification, but a lot of the implementation is reliant on the athletes. The goal of coaches is to make the technique second nature for young athletes, so they are able to apply the techniques in real world, fast paced, game situations. However, due to the limits on practice time because of the young age group, coaches may not have adequate time to ensure that Heads Up Tackling is engrained in their athletes. This may contribute to the variability in implementation among players, and to some youth forgetting the Heads Up Tackling protocols during games and resorting to basic instincts. There is supporting literature to the reduced effectiveness of injury prevention interventions during games as opposed to practices (Cobb et al., 2013; Kerr et al., 2015). These findings may help explain the findings of Kerr et al. (2015), that the differences in head impacts per practice for Heads Up versus non-Heads Up leagues is not maintained for games.

With tackle football starting at five years old, there are significant differences in the mental development of youth football players. Young age, as highlighted by participants, is two-sided. Though working with young athletes with no prior playing

experience removes the challenge of unlearning bad habits, younger players may not be able to fully comprehend and apply the more intricate details of Heads Up Tackling. There is conflicting literature about the benefits versus risks of early exposure to contact in youth sports, suggesting that the appropriate age for involvement in contact sports is not clear-cut (Hagel et al., 2006; Macpherson et al., 2006; Stamm et al., 2015). The additional variability in coach implementation is also a challenge, because the technique is not as successful if opponents are not using it as well. This is a significant complexity, given that the most highly touted benefit of the program is the improvements to player safety.

Coaches whose primary focus is winning were perceived to be less favorable to Heads Up Tackling. This is surprising given that several coaches noted Heads Up Tackling as being a more effective tackling method than using your head to tackle. This discrepancy, may reflect the hardline focus on the outcome of the game rather, than the techniques the players are implementing, and may explain why one coach suggested that Heads Up market its effectiveness as a tackling technique, rather than as a head injury prevention initiative.

Coaches' attitudes may also determine their perspective about the concussion protocols taught in the certification course. As mentioned previously, coaches regularly mentioned the concussion protocols and other components of the certification when discussing the innovation. Several studies have suggested that coaches' adherence to concussion policy may be complicated by their attitudes towards injuries, and coaches' and parents' desires to win (Baugh et al., 2014; Chrisman et al., 2013).

In addition, coaches' attitudes may be linked to the differing views on how Heads Up changed the way the game of football has been played that were identified in the analysis. For coaches who were warned against the dangers of launching themselves full speed at their opponent, and who subsequently taught their athletes not to use their heads in tackling, Heads Up is not much of a change. However, for coaches who are not teaching this way, Heads Up may seem like it is changing the essence of the game. Given that some coaches have been coaching for many years, some may be set in their ways, and unwilling to adapt to Heads Up Tackling.

Ecological context

These interviews support that the persuasion constructs outlined in Rogers' *Diffusion of Innovations* theory contribute to the adoption-decision of Heads Up Tackling, among youth football coaches, but also revealed that there is more involved. As illustrated in Figure 3 the diffusion of Heads Up exists within an ecological framework. The *Social Ecological Model* provides a framework for understanding how behavior is influenced by various multidimensional aspects of individuals' physical and social environments and personal characteristics (Glanz, Rimer, & Viswanath, 2008; Riekert, Ockene, & Pbert, 2013). For example, the coaches' decision is directly impacted by the attitudes of his players' parents, the park and league for which he coaches, and the policies in place. According to the model, the interplay among these environmental levels of influence (*intrapersonal*, *interpersonal*, *organizational*, *community*, and *policy*) helps to shape individual's behavior.

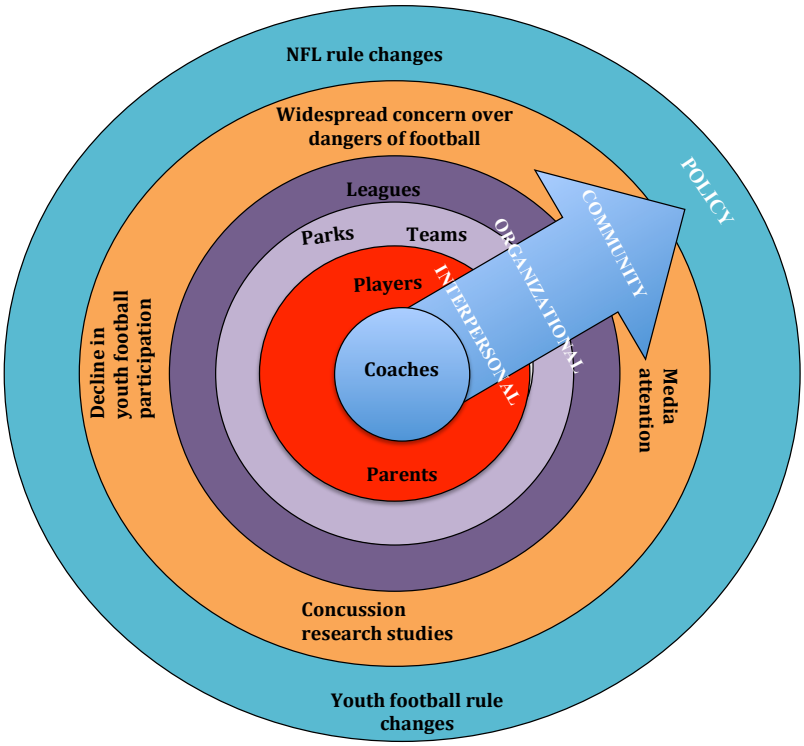

Figure 3. Ecological context in which the adoption-decision process of USA Football's Heads Up Football program operates. This adaptation of the Social-ecological model depicts the interpersonal, organization, community and policy level factors that impact the decision process of youth football coaches in regards to adoption of Heads Up Tackling.

Thus while coaches are considered the primary decision makers—in that the program was created for and marketed to coaches— there are a multitude of factors external to the coach that influence adoption and compliance with the tackling strategies advocated by Heads Up.

Policy. The absence of a central governing body in youth football results in much variation in terms of adoption and implementation of Heads Up Tackling. Studies have found large variability in implementation of sports injury prevention interventions (Frank, Register-Mihalik, & Padua, 2015; Soligard et al., 2010). According to these results, youth football programs with the capacity to police implementation have higher compliance than ones that do not. Without any form of regulation it is easy for adoption

to end at the certification process, for coaches who do not have enough other motivation. Among female soccer players, Frank et al. (2015) similarly found that, although there was a club policy in place that mandated implementation of an ACL injury prevention program, only approximately half of the female soccer coaches adopted the program. Further, studies have suggested that sports injury prevention innovations that rely on the use of coaching workshops and materials and resources, such as DVDs, print materials, websites, and toolkits, to train coaches typically are not sufficient to promote positive behavior change among athletic coaches (Donaldson & Finch, 2013; Frank et al., 2015).

Community. A recently released report indicates that youth football participation increased in 2015, which USA Football attributes to injury prevention initiatives in the sport, such as Heads Up (USA Today High School Sports, 2016). With the increased media attention and research studies surrounding the links between football and long-term issues, youth football coaches and programs may feel increased pressure to subscribe to Heads Up because of it's publicized commitment to player safety. Soligard et al. (2010) found that three-quarters of girl's soccer coaches reported that their motivation to do injury prevention training is heavily influenced by the media and depicted athletes. Coaches recognized that in order to curtail this decline in participation, and essentially save a sport they believe is beneficial to the overall development of children, they need to regain the support and trust of parents—something for which Heads Up provides an opportunity.

Organizational. The cultures within these youth football organizational structures influence adoption of the tackling style. Analysis of the interviews revealed that some programs emphasize safety as their highest priority. Furthermore some organizations

choose to adopt policies regarding certification of their coaches. In contrast, there are programs in communities where parents and coaches are very invested in the game, and their main concern is beating the other team and they become excited about forceful plays and violent hits. In programs that adopt this intense focus on outcomes over safety of the players, safety efforts like Heads Up are not viewed as a priority, consequently, creating an environment that is not conducive to coaches interested in adopting the technique. For coaches who are especially motivated, this misalignment in values may be significant enough to lead to a transition to a new park or league. However, other coaches may succumb to the peer pressure.

Interpersonal. Many of the coaches referred to the declining rates of youth football participation as key influencers on the appeal and diffusion of Heads Up football. In some cases this may be attributable to the parental "climate" as well. The statistics on the drop in youth football participation are often cited as the result of concussion awareness among parents. Youth football programs in communities where parents are especially anxious about their children's safety, may promote diffusion in these organizations.

Implementation

The second aim of this study was to explore how coaches were incorporating their Heads Up training into their coaching. The most often mentioned methods were use of the Heads Up Tackling, blocking, and developmental drills in practice. Even for coaches who are already aware that tackling with your head is wrong, Heads Up gives them an arsenal of resources and drills to strategically teach youth football players proper tackling techniques. However, throughout the interviews there was a subtle suggestion that heads

up creates an easy, straight forward, and explicative slogan, almost, to convey the tackling technique to players. Adages with some iteration of "heads up" were commonly referred to by coaches, in their descriptions of communications with their players during practices and games. One coach summed up the target of Heads Up Tackling in its simplest form, by stating that even though there are various strategies and techniques involved in a proper heads-up tackle, "basically the key of it all is to keep your head up no matter what's going on. Even if you're not tackling the right way or taking proper form, the wrong steps— heads up, always."

Although many coaches believed that the incidence of concussions at their level is much lower than in higher levels of play, several coaches acknowledged that the concussion protocols were the most observed and perceived to be the most adopted element of the program. Further, to allow for more developmental time for improving technique, as well as to further this commitment to safety, Heads Up advocates for less contact time in practice. With more of a focus on teaching proper tackling skills and form, a lot of which can be done using tackling dummies, there is not as much a need to run full contact drills. As a result of the Heads Up training's emphasis on limiting contact and including more water breaks, coaches have appreciably reduced the amount of practice time devoted to full contact drills and interspersed more water breaks into their practice structure.

An interesting incorporation of Heads Up, referenced by a few coaches, was the use of parent clinics. Given the influence of parents, as well as the fear incited by the media and scientific attention on concussions in football, a hands-on, transparent

approach to encouraging parental support is an invaluable implementation of the Heads Up training.

Limitations

While this study is the first to explore the adoption and implementation of USA Football's Heads Up Tackling initiative among youth football coaches, it is not without limitations. The sample size was notably small. Although, the purpose of qualitative inquiry is not to achieve generalizability, a larger sample size would have enabled a more thorough examination of the adoption and implementation of Heads Up among Greater Atlanta youth football coaches. Furthermore, the presence of only one non-certified coach hinders the ability to fully explore non-adoption of the program. Recruitment efforts took place over 6 months. Over 100 youth football coaches in the area were contacted, multiple times, via various methods, however only 10 agreed to participate in the study. In order to increase the likelihood of participation, halfway through the study free CPR training was offered as an incentive but it did not increase interest in study participation.

That fewer than ten percent of those contacted made an effort to participate may indicate something about the dedicated nature of the study's participants. In addition to their coaching positions, three of the participants were Player Safety Coaches/Coordinators and two were Athletic Directors. It is important to recognize that self-selection by these coaches may have influenced the findings. Those who chose to participate may have been more committed to player safety than the average youth football coach. This may further be reflected by having so many more Heads Up certified coaches than non-certified coaches responding to the study solicitations.

Additionally, exploration of factors contributing to certification was limited by a sample in which all of the certified coaches were required by their league or park to become Heads Up certified. While, interviews provided valuable insight into factors impacting incorporation of Heads Up Tackling into their coaching, coaches could not add much personal perspective on factors behind their own motivations to get certified.

With Heads Up Tackling marketed as an injury prevention effort, social desirability bias may have been a factor in study findings. This was even hinted upon by one participant, who stated that,

> If somebody comes up to them [coaches] and says, 'Hey, your child or your kid should be using Heads Up Football techniques…' there's really no way that you can debate saying, 'no I'm not going to teach that.' Because if you say that, then everybody's going to say, well then you shouldn't be coaching kids... So, most coaches out in front of somebody else, they aren't going to just say, 'Hey, I'm not going to teach it.' Nah. Whether or not they actually go and implement that when nobody else is looking, that's another thing.

As this point illustrates, verbalizing dissent for Heads Up Tackling may carry the perception that a coach does not care about his or her players. Therefore, although coaches were reminded of the confidentiality of their responses prior to the interview, they may still have been reluctant to say anything that could be perceived as a disregard for child safety or wellbeing. Phone interviews, may have provided some degree of anonymity, which may have encouraged coaches to speak freely. However, some of the opportunities for connecting and rapport building were lost due to the nature of phone conversations. Phone interviews were chosen after several unsuccessful attempts to recruit for face-to-face interviews. Coaches were more receptive to phone interview requests, which could have implications for the transparency of the interviewees.

Implications

Despite these limitations, this study serves as a critical first step. Considering this is the first study exploring attitudes toward Heads Up Tackling, it contributes to the scarce literature in the area. Further, there is limited theory-driven research on sports-related concussion prevention strategies (Covassin, Elbin, & Sarmiento, 2012; Kroshus, Baugh, Daneshvar, & Viswanath, 2014; McGlashan & Finch, 2010). Therefore, this research helps to fill some voids in the present literature.

In light of the recent study showing the effectiveness of the Heads Up Tackling technique, understanding the Diffusion-Innovation process of adopting this new initiative, may have profound effects on the sport (Kerr et al., 2015). Many of the laws and policies for concussion management, thus far, have centered on secondary prevention. Return-to-play legislation has aimed at improving concussion identification, education, and recovery protocols, in an effort to keep concussed athletes out of games (CDC, 2014a). If the goal is primary prevention and reducing the number of concussions that occur annually, understanding the factors that go into adoption of preventive strategies is essential to achieving this goal. Addressing barriers to Heads Up adoption by youth football coaches may serve as a critical intervention points, for USA Football and other youth football organizing bodies. Likewise, capitalizing on the facilitators to Heads Up adoption may also provide important target areas for promoting diffusion of Heads Up throughout youth football.

The findings of this study show that completing the Heads Up certification is only half of the process. Without the proper organizational infrastructure and support in place, national level implementation is very difficult. As evidenced by these interviews, the

majority of the advantages of Heads Up Tackling occur as a result of actually using the techniques, not simply getting the certification. Further, a lot of these benefits (e.g. decline in injuries, rise in football participation, enhanced player development, improved success on the field) may take a while to manifest. Thus, national level implementation policies may be necessary to supplement this delayed gratification, and encourage widespread full adoption of Heads Up Tackling. Likewise, Heads Up is still a relatively new program, and many of the participants reported having been certified for several years. Their responses lend credence to the notion that, for coaches whose thinking was already aligned with the theory behind Heads Up Tackling but they just did not have the strategic techniques yet, or for *innovators,* who are willing to try something new, the characteristics of the innovation are likely enough to persuade them. However, for *laggards* (i.e., coaches who are resistant to the changes occurring in the sport), more organizational intervention may be more appropriate.

As noted, while the results of this study lend support to the importance of the constructs outlined in *Diffusion of Innovations* theory, they also indicate that there is a larger ecological context within which coaches' decisions about adoption—and the extent of adoption—of Heads Up Tackling are navigated. In line with this study's findings, sports injury prevention implementation science literature reports that there is disconnect between knowledge acquisition and behavior change (Donaldson & Finch, 2013; Finch, 2011; Frank et al., 2015). Since one of the goals of behavioral sciences and health education research is to understand the factors that influence behaviors in order to incite behavior change, implementation science poses an important avenue for sports injury prevention literature to explore.

In order to move from knowledge to practice, we need to better understand the core factors that contribute to successful implementation. This study provides some context for potential factors that facilitate consistent application of Heads Up Tackling by youth football coaches, but also identifies notable absences in the current program and youth football organizational structure. According to the Implementation Drivers framework, proposed by Fixsen, Naoom, Blase, and Friedman (2005), there are several core implementation drivers that facilitate consistent use of innovations. These drivers include *competency drivers* (e.g., coaches, training, selection); *organizational drivers* (e.g., systems interventions, facilitative administrative, decision support systems); and *leadership drivers* (e.g., technical and adaptive leadership) (Donaldson & Finch, 2013; Fixsen et al., 2005). Figure 4 depicts this framework, adapted to include the results of this study. As previously discussed *competency drivers* alone, like the Heads Up training, may not be adequate enough to encourage use of the techniques. However having appropriate organizational structure and resources, as well as effective and adaptive leadership committed to the program and player safety, likely drive more consistent use of Heads Up Tackling by youth coaches. Further, as Figure 4 and the findings indicate, more attention to performance assessment and quality control and improvement may be areas for future intervention and exploration.

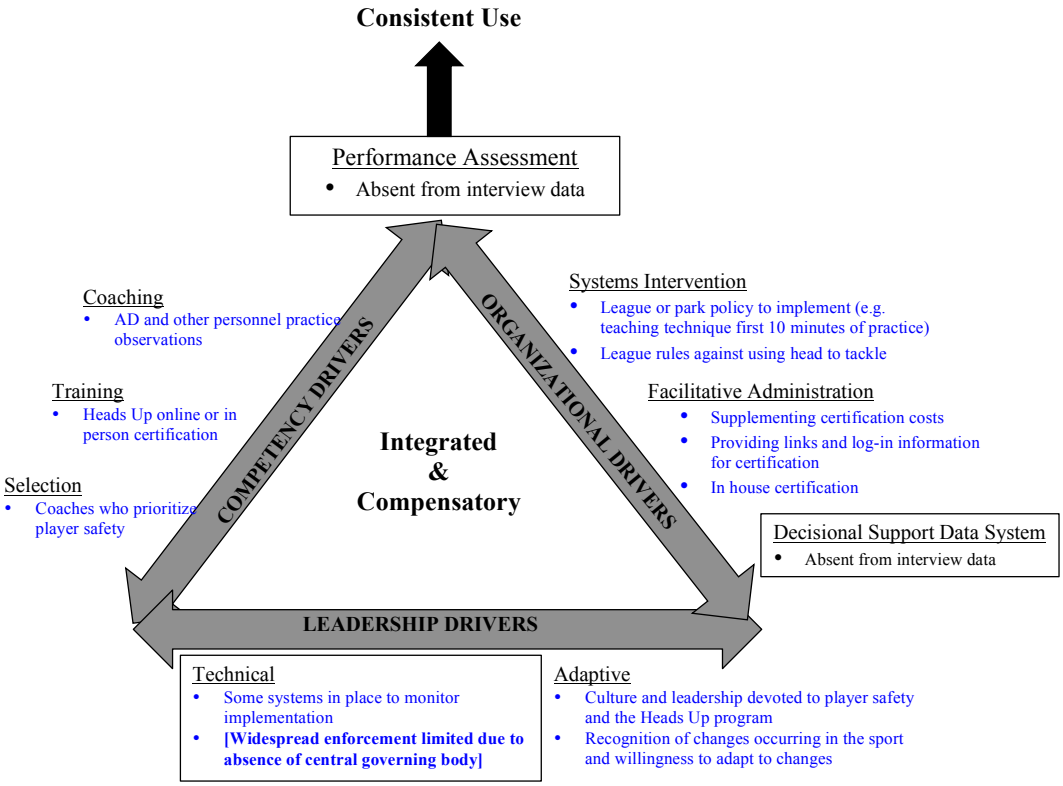

Figure 4. Implementation Drivers Framework adapted from Donaldson and Finch (2013) to illustrate application to study findings on factors contributing to implementation of Heads Up Tackling by youth football coaches in the Greater Atlanta area.

Future Studies

Future studies can further this research by understanding attitudes toward and perceptions of Heads Up Tackling among other youth football stakeholders (e.g., athletes, parents, and policymakers). Coaches are only one component of the decision-making body. As revealed in the analysis of the interviews, the implementation of the Heads Up Tackling program is dependent on the other significant figures, particularly the young athletes.

Given the recent events that have occurred surrounding the NFL concussion crisis: release of a blockbuster film chronicling the man behind the discovery of CTE and

its relation to playing professional football, the admission by the NFL's executive vice president for health and safety policy about the link between football and neurodegenerative brain diseases, and the upswing in young players retiring early from the league due to concerns over head injuries, diffusion of Heads Up beyond youth football makes a logical potential area of inquiry (Boswell, 2015; Dargis, 2015; U.S. News, 2016). Feasibility studies can be done in the future to explore the practicality of using Heads Up Tackling at higher levels of play, notably collegiate and professional football leagues.

Concussions are a relevant issue in many sports, and youth are particularly affected. The findings from this study contribute to advancing the literature in this area. This study found that perceived and observed advantages, challenges, and compatibility of the program with coaches and players' values, along with organizational factors and larger environmental changes, contribute to adoption of USA Football's Heads Up Tackling initiative among youth football coaches. Capitalizing on the facilitating factors and mitigating the challenges to implementation, may contribute to creating a safer game at all levels, especially for the most vulnerable—young athletes.

REFERENCES

Alic, S. (2016). Participation for tackle and flag football increases in 2015. Retrieved from http://usafootball.com/blogs/americas-game/post/11740/participation-for-tackle-and-flag-football-increases-in-2015

Baugh, C. M., Kroshus, E., Daneshvar, D. H., & Stern, R. A. (2014). Perceived Coach Support and Concussion Symptom‐Reporting: Differences between Freshmen and Non‐Freshmen College Football Players. *The Journal of Law, Medicine & Ethics, 42*(3), 314-322. doi:10.1111/jlme.12148

Beaudoin, C., Callary, B., & Trudeau, F. (2015). Coaches' Adoption and Implementation of Sport Canada's Long-Term Athlete Development Model. *SAGE Open, 5*(3), 2158-2440.

Benson, B. W., McIntosh, A. S., Maddocks, D., Herring, S. A., Raftery, M., & Dvorak, J. (2013). What are the most effective risk-reduction strategies in sport concussion? *Br J Sports Med, 47*(5), 321-326. doi:10.1136/bjsports-2013-092216

Boswell, T. (2015). As another NFL player retires early, football's future comes under scrutiny. Retrieved from https://www.washingtonpost.com/sports/redskins/as-another-nfl-player-retires-early-footballs-future-comes-under-scrutiny/2015/03/17/62d52b4e-cccd-11e4-a2a7-9517a3a70506_story.html

Bowen, A. P. (2003). Second impact syndrome: a rare, catastrophic, preventable complication of concussion in young athletes. *Journal of Emergency Nursing, 29*(3), 287-289.

Broglio, S. P., Surma, T., & Ashton-Miller, J. A. (2012). High school and collegiate football athlete concussions: a biomechanical review. *Ann Biomed Eng, 40*(1), 37-46. doi:10.1007/s10439-011-0396-0

CDC. (2011). Concussion in Sports and Play: Get the Facts. *Injury Prevention & Control: Traumatic Brain Injury.* Retrieved from http://www.cdc.gov/concussion/sports/facts.html

CDC. (2014a). Get a Heads Up on Concussion in Sports Policies. *Injury Prevention & Control: Traumatic Brain Injury.* Retrieved from http://www.cdc.gov/concussion/policies.html

CDC. (2014b). Heads Up Concussion in Football. Retrieved from http://www.cdc.gov/concussion/HeadsUp/pdf/Football_Fact_Sheet_Coaches-a.pdf

Chrisman, S. P., Quitiquit, C., & Rivara, F. P. (2013). Qualitative study of barriers to concussive symptom reporting in high school athletics. *J Adolesc Health, 52*(3), 330-335 e333. doi:10.1016/j.jadohealth.2012.10.271

Cobb, B. R., Urban, J. E., Davenport, E. M., Rowson, S., Duma, S. M., Maldjian, J. A., . . . Stitzel, J. D. (2013). Head Impact Exposure in Youth Football: Elementary School Ages 9–12 Years and the Effect of Practice Structure. *Annals of Biomedical Engineering, 41*(12), 2463-2473. doi:10.1007/s10439-013-0867-6

Cook, A., King, H., & Polikandriotis, J. A. (2014). Where Do We Go from Here: An inside Look into the Development of Georgia's Youth Concussion Law. *JL Med. & Ethics, 42*, 284.

Covassin, T., Elbin, R., & Sarmiento, K. (2012). Educating coaches about concussion in sports: evaluation of the CDC's "Heads Up: Concussion in Youth Sports" initiative. *Journal of school health, 82*(5), 233-238.

Crisco, J. J., & Greenwald, R. M. (2011). Let's get the head further out of the game: A proposal for reducing brain injuries in helmeted contact sports. *Current Sports Medicine Reports, 10*(1), 7-9. doi:10.1249/JSR.0b013e318205e063

Daneshvar, D. H., Nowinski, C. J., McKee, A. C., & Cantu, R. C. (2011). The epidemiology of sport-related concussion. *Clin Sports Med, 30*(1), 1-17, vii. doi:10.1016/j.csm.2010.08.006

Daniel, R. W., Rowson, S., & Duma, S. M. (2012). Head Impact Exposure in Youth Football. *Annals of Biomedical Engineering, 40*(4), 976-981. doi:10.1007/s10439-012-0530-7

Dargis, M. (2015). Review: In 'Concussion,' a Doctor's Cri de Coeur Against Football's Risks. Retrieved from http://www.nytimes.com/2015/12/25/movies/review-in-concussion-a-doctors-cri-de-coeur-against-footballs-risks.html?_r=2

Donaldson, A., & Finch, C. F. (2013). Applying implementation science to sports injury prevention. *Br J Sports Med, 47*(8), 473-475.

Emery, C. A., Hagel, B., Decloe, M., & Carly, M. (2010). Risk factors for injury and severe injury in youth ice hockey: a systematic review of the literature. *Inj Prev, 16*(2), 113-118. doi:10.1136/ip.2009.022764

Finch, C. F. (2011). No longer lost in translation: the art and science of sports injury prevention implementation research. *Br J Sports Med*, 1473-0480.

Fixsen, D. L., Naoom, S. F., Blase, K. A., & Friedman, R. M. (2005). Implementation research: a synthesis of the literature.

Frank, B. S., Register-Mihalik, J., & Padua, D. A. (2015). High levels of coach intent to integrate a ACL injury prevention program into training does not translate to effective implementation. *Journal of Science and Medicine in Sport, 18*(4), 400-406.

Gilbert, F., & Johnson, L. S. M. (2011). The impact of American tackle football-related concussion in youth athletes. *AJOB Neuroscience, 2*(4), 48-59.

Glanz, K., Rimer, B. K., & Viswanath, K. (2008). *Health behavior and health education: theory, research, and practice* (4th ed.). San Francisco, CA: Jossey-Bass.

Goodell, R., & Butler, J. (2013). Roger Goodell: The Way Forward to a Better, Safer Game. Retrieved from http://www.usatoday.com/story/opinion/2013/08/01/football-nfl-pop-warner-roger-goodell-column/2597677/

Guskiewicz, K. M., Bruce, S. L., Cantu, R. C., Ferrara, M. S., Kelly, J. P., McCrea, M., … McLeod, T. C. V. (2004). National Athletic Trainers' Association position statement: Management of sport-related concussion. *JOURNAL OF ATHLETIC TRAINING, 39*(3), 280-297.

Guskiewicz, K. M., Weaver, N. L., Padua, D. A., & Garrett, W. E., Jr. (2000). Epidemiology of concussion in collegiate and high school football players. *Am J Sports Med, 28*(5), 643-650.

Hagel, B. E., Marko, J., Dryden, D., Couperthwaite, A. B., Sommerfeldt, J., & Rowe, B. H. (2006). Effect of bodychecking on injury rates among minor ice hockey players. *CMAJ, 175*(2), 155-160. doi:10.1503/cmaj.051531

Heck, J. F., Clarke, K. S., Peterson, T. R., Torg, J. S., & Weis, M. P. (2004). National Athletic Trainers' Association Position Statement: Head-Down Contact and Spearing in Tackle Football. *JOURNAL OF ATHLETIC TRAINING, 39*(1), 101-111.

Johnson, L. S. (2012). Return to play guidelines cannot solve the football-related concussion problem. *J Sch Health, 82*(4), 180-185. doi:10.1111/j.1746-1561.2011.00684.x

Karlin, A. M. (2011). Concussion in the pediatric and adolescent population: "different population, different concerns". *PM R, 3*(10 Suppl 2), S369-379. doi:10.1016/j.pmrj.2011.07.015

Keightley, M. L., Singh Saluja, R., Chen, J.-K., Gagnon, I., Leonard, G., Petrides, M., & Ptito, A. (2014). A functional magnetic resonance imaging study of working memory in youth after sports-related concussion: is it still working? *Journal of neurotrauma, 31*(5), 437-451.

Kerr, Z. Y., Collins, C. L., Mihalik, J. P., Marshall, S. W., Guskiewicz, K. M., & Comstock, R. D. (2014). Impact locations and concussion outcomes in high school football player-to-player collisions. *Pediatrics, 134*(3), 489-496. doi:10.1542/peds.2014-0770

Kerr, Z. Y., Yeargin, S. W., McLeod, T. C. V., Mensch, J., Hayden, R., & Dompier, T. P. (2015). Comprehensive Coach Education Reduces Head Impact Exposure in American Youth Football. *Orthopaedic journal of sports medicine, 3*(10), 2325-9671.

King, D., Brughelli, M., Hume, P., & Gissane, C. (2014). Assessment, management and knowledge of sport-related concussion: systematic review. *Sports Med, 44*(4), 449-471. doi:10.1007/s40279-013-0134-x

Kirkwood, M. W., Yeates, K. O., & Wilson, P. E. (2006). Pediatric sport-related concussion: a review of the clinical management of an oft-neglected population. *Pediatrics, 117*(4), 1359-1371.

Kroshus, E., Baugh, C. M., Daneshvar, D. H., & Viswanath, K. (2014). Understanding concussion reporting using a model based on the theory of planned behavior. *Journal of Adolescent Health, 54*(3), 269-274. e262.

Lovell, M. (2009). The management of sports-related concussion: current status and future trends. *Clin Sports Med, 28*(1), 95-111. doi:10.1016/j.csm.2008.08.008

Mack, N., Woodsong, C., MacQueen, K. M., Guest, G., & Namey, E. (2005). Qualitative research methods: a data collectors field guide.

Macpherson, A., Rothman, L., & Howard, A. (2006). Body-checking rules and childhood injuries in ice hockey. *Pediatrics, 117*(2), e143-147. doi:10.1542/peds.2005-1163

McCrea, M., Hammeke, T., Olsen, G., Leo, P., & Guskiewicz, K. (2004). Unreported concussion in high school football players: implications for prevention. *Clin J Sport Med, 14*(1), 13-17.

McCrory, P., Meeuwisse, W., Aubry, M., Cantu, B., Dvorak, J., Echemendia, R., . . . Turner, M. (2013). Consensus statement on Concussion in Sport - The 4th International Conference on Concussion in Sport held in Zurich, November 2012. *Phys Ther Sport, 14*(2), e1-e13. doi:10.1016/j.ptsp.2013.03.002

McGlashan, A. J., & Finch, C. F. (2010). The extent to which behavioural and social sciences theories and models are used in sport injury prevention research. *Sports Med, 40*(10), 841-858.

Moore, D. R., Pindus, D. M., Raine, L. B., Drollette, E. S., Scudder, M. R., Ellemberg, D., & Hillman, C. H. (2016). The persistent influence of concussion on attention, executive control and neuroelectric function in preadolescent children. *International Journal of Psychophysiology, 99*, 85-95.

National Center for Injury Prevention and Control. (2008). Heads Up: Concussion in Youth Sports, Activity Report (2007–2008).

Patel, D. R., & Reddy, V. (2010). Sport-related concussion in adolescents. *Pediatr Clin North Am, 57*(3), 649-670. doi:10.1016/j.pcl.2010.03.006

Putukian, M., & Kutcher, J. (2014). Current Concepts in the Treatment of Sports Concussions. *Neurosurgery, 75 Suppl 4*, S64-S70. doi:10.1227/NEU.0000000000000492

Ransom, D. M., Vaughan, C. G., Pratson, L., Sady, M. D., McGill, C. A., & Gioia, G. A. (2015). Academic effects of concussion in children and adolescents. *Pediatrics, 135*(6), 1043-1050.

Riekert, K. A., Ockene, J. K., & Pbert, L. (2013). *The handbook of health behavior change*: Springer Publishing Company.

Ritchie, J., Lewis, J., Nicholls, C. M., & Ormston, R. (2013). *Qualitative research practice: A guide for social science students and researchers*: Sage.

Rogers, E. M. (1995). *Diffusion of innovations* (4th ed.). New York: Free Press.

Rowson, S., McAllister, T. W., Maerlender, A. C., Broglio, S. P., Schnebel, B., Anderson, S., . . . Wilcox, B. J. (2014). Can helmet design reduce the risk of concussion in football? *Journal of neurosurgery, 120*(4), 919.

Sahin, I. (2006). Detailed review of Rogers' diffusion of innovations theory and educational technology-related studies based on Rogers' theory. *TOJET: The Turkish Online Journal of Educational Technology, 5*(2).

Sawyer, R. J., Hamdallah, M., White, D., Pruzan, M., Mitchko, J., & Huitric, M. (2010). High school coaches' assessments, intentions to use, and use of a concussion prevention toolkit: Centers for Disease Control and Prevention's heads up: concussion in high school sports. *Health Promot Pract, 11*(1), 34-43. doi:10.1177/1524839907309377

Soligard, T., Nilstad, A., Steffen, K., Myklebust, G., Holme, I., Dvorak, J., . . . Andersen, T. E. (2010). Compliance with a comprehensive warm-up programme to prevent injuries in youth football. *Br J Sports Med, 44*(11), 787-793.

Stamm, J. M., Bourlas, A. P., Baugh, C. M., Fritts, N. G., Daneshvar, D. H., Martin, B. M., . . . Stern, R. A. (2015). Age of first exposure to football and later-life cognitive impairment in former NFL players. *Neurology, 84*(11), 1114-1120.

U.S. News. (2016). NFL Executive Admits to CTE Link. Retrieved from http://www.usnews.com/news/sports/articles/2016-03-14/nfl-exec-admits-to-cte-football-head-trauma-link

USA Football. (2010). Heads Up Football is USA Football's National Initiative to Help Make the Sport of Football Better and Safer. Retrieved from http://usafootball.com/headsup/

USA Today High School Sports. (2016). Survey shows increase in youth football participation. Retrieved from http://usatodayhss.com/2016/survey-shows-increase-in-youth-football-participation

Viano, D. C., Casson, I. R., & Pellman, E. J. (2007). Concussion in professional football: biomechanics of the struck player--part 14. *Neurosurgery, 61*(2), 313-327; discussion 327-318. doi:10.1227/01.NEU.0000279969.02685.D0

Wing, R., & James, C. (2013). Pediatric head injury and concussion. *Emerg Med Clin North Am, 31*(3), 653-675. doi:10.1016/j.emc.2013.05.007

Wong, R. H., Wong, A. K., & Bailes, J. E. (2014). Frequency, magnitude, and distribution of head impacts in Pop Warner football: the cumulative burden. *Clinical neurology and neurosurgery, 118*, 1-4. doi:10.1016/j.clineuro.2013.11.036

Young, T. J., Daniel, R. W., Rowson, S., & Duma, S. M. (2014). Head Impact Exposure in Youth Football: Elementary School Ages 7-8 Years and the Effect of Returning Players. *Clinical Journal of Sport Medicine, 24*(5), 416-421. doi:10.1097/JSM.0000000000000055

APPENDIX A: Interview Guide

BACKGROUND:		
1.	**Describe your experience as a youth football coach?** a. How long have you been coaching? b. How often do you have contact practices? Who decides the drills?	
2.	**What do you see as some of the major concerns for youth football coaches?** a. Do you think youth football needs to be made safer? If so, how would you make the youth football safer? b. How do you think tackling techniques impact the safety of youth football?	**FELT NEED**
3.	**How do you feel about the attention youth football has placed on addressing concussions?**	**FELT NEED**
4.	**Tell me about the Georgia concussion law? How do you feel about the law?** a. What are the difficulties with implementing the Georgia concussion law?	
EXPERIENCE WITH HEADS UP TACKLING:		
5.	**What do you think of the USA Football's Heads Up program?** a. How did you first hear about the U.S.A. Football's Heads Up program?	**FELT NEED**

	b. Do you believe USA Football's Heads Up Tackling initiative is needed? Why or why not? c. How do the Heads Up techniques affect the safety of the sport? d. How does it change the way the game is played? e. Do you think the initiative has accomplished its goals?	
6.	**What are the benefits of becoming Heads Up certified?**	**RELATIVE ADVANTAGE**
7.	**What are the barriers to becoming Heads Up certified?**	**COMPLEXITY**
8.	**Are you Heads Up coaching certified? Why or why not?** a. If not certified, have you considered becoming certified in Heads Up Tackling techniques? i. If so, what encouraged you to consider becoming certified? ii. If not, what has hindered you from considering Heads Up certification? b. If certified, tell me about your experience with the Heads Up program. i. How have you incorporated it into your coaching? ii. Are there benefits of adopting this technique? iii. Can you give me an example from last season or this season where you saw that the program worked? Where it failed?	**ADOPTION**
9.	**What are the challenges to implementing the Heads Up Tackling techniques?**	**COMPLEXITY**

a. How can the techniques be implemented during a game setting?	
10. How have you seen Heads Up Tackling used by youth football players in games? a. Can you give me an example from this season or last season?	**OBSERVABILITY**
11. How does the Heads Up Tackling technique compare to traditional tackling techniques?	**RELATIVE ADVANTAGE**
12. How does the Heads Up Tackling technique fit with your current coaching style? How does it fit with the way youth football is played?	**COMPATIBILITY**
FOR NON-CERTIFIED COACHES ONLY:	
13. How would your student athletes react to adopting Heads Up Tackling techniques?	**COMPATIBILITY**
14. How would you try out the Heads Up technique with your athletes? a. How feasible is it to try out the Heads Up technique with your athletes?	**TRIALABILITY**
CLOSING QUESTIONS:	
15. What are other ways of addressing concussions in your sport? What methods?	
16. What advice would you give coaches interested in adopting Heads Up Tackling? a. What advice would you give to players?	

17.	**What was your favorite football moment from this past season?**	
18.	**Is there anything else you want to mention that we didn't discuss?**	

APPENDIX B: Consent Form

Emory University
Consent to be a Research Subject

Title: Qualitative Study on Adoption of Heads Up Tackling by Youth Football Coaches

Principal Investigator: Alice Daramola B.S., Behavioral Sciences and Health Education Department

Introduction

You are being asked to be in a research study. This form is designed to tell you everything you need to think about before you decide to consent (agree) to be in the study or not to be in the study. **It is entirely your choice. If you decide to take part, you can change your mind later on and withdraw from the research study. Participation is voluntary.**

Before making your decision:

- Please carefully read this form or have it read to you
- Please ask questions about anything that is not clear

You can take a copy of this consent form, to keep. Feel free to take your time thinking about whether you would like to participate. By signing this form you will not give up any legal rights.

Study Overview

The purpose of this study is to explore the; 1) perceived characteristics of Heads Up Tackling that lead to adoption (becoming certified) or non-adoption of the program among youth football coaches; and 2) implementation of Heads Up Tackling among certified coaches.

Procedures

If you agree to participate in the study, you will be asked to participate in a one-on-one interview with the principal investigator for this study at your convenience. During the interviews, we will discuss Interviews will cover background in coaching, perceived strengths and weaknesses of Heads Up Tackling, experience with Heads Up, and future directions of injury prevention in football. Interviews will be audio-recorded and last approximately 45-60 minutes. Upon completion of the interviews, your name will not be stored with the recordings and any identifying information will be deleted from the transcripts to maintain confidentiality.

Risks and Discomforts

It is possible that we could discuss a sensitive topic during our interview. However, we can stop the conversation if you feel uncomfortable. All your answers will remain confidential.

Benefits

This study is not designed to benefit you directly. This study is designed to learn more about the perceived benefits and barriers to adopting and implementing the Heads Up Tackling program among youth football coaches. The study results may be used to help others in the future.

Compensation

You will not be offered payment for being in this study.

Confidentiality

Certain offices and people other than the researchers may look at study records. Government agencies and Emory employees overseeing proper study conduct may look at your study records. These offices include [the Office for Human Research Protections, the funder(s), the Emory Institutional Review Board, the Emory Office of Research Compliance]. Emory will keep any research records we create private to the extent we are required to do so by law. A study number rather than your name will be used on study records wherever possible. Your name and other facts that might point to you will not appear when we present this study or publish its results.

Study records can be opened by court order. They may also be produced in response to a subpoena or a request for production of documents.

Voluntary Participation and Withdrawal from the Study

You have the right to leave a study at any time without penalty. You may refuse to do any procedures you do not feel comfortable with, or answer any questions that you do not wish to answer. If you chose to withdraw from the study you may request that any information obtained from your participation not be used.

Contact Information

Contact Alice Daramola at headsupstudy@gmail.com

- if you have any questions about this study or your part in it,
- if you have questions, concerns or complaints about the research

Contact the Emory Institutional Review Board at 404-712-0720 or 877-503-9797 or irb@emory.edu:

- if you have questions about your rights as a research participant.
- if you have questions, concerns or complaints about the research.
- You may also let the IRB know about your experience as a research participant through our Research Participant Survey at http://www.surveymonkey.com/s/6ZDMW75.

Consent

Please, print your name and sign below if you agree to be in this study. By signing this consent form, you will not give up any of your legal rights. We will give you a copy of the signed consent, to keep.

_____

Name of Subject

_____ _____

Signature of Subject Date

Time

_____ _____

Signature of Person Conducting Informed Consent Discussion Date

Time