

MEASURING THE PERCEIVED EFFECTIVENESS OF CONCUSSION  
LEGISLATION IN MICHIGAN'S SCHOOLS

by

DALLAS JAMES LINTNER

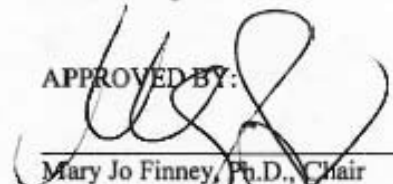
A dissertation submitted in partial fulfillment of the requirements for the degree of


DOCTOR OF EDUCATION:  
EDUCATIONAL LEADERSHIP

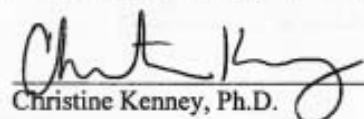
2017

University of Michigan – Flint  
Flint, Michigan

APPROVED BY:

  
\_\_\_\_\_  
Mary Jo Finney, Ph.D., Chair      2-20-18  
Date

  
\_\_\_\_\_  
De'Andre Shepard, Ph.D.      2-20-18  
Date

  
\_\_\_\_\_  
Christine Kenney, Ph.D.      2-20-18  
Date

© Copyright by Dallas James Lintner, 2017  
All rights reserved

*To my beautiful wife Jennifer, and our children Jackson and Ainsley. Your love, patience, and support are the only way that I have made it through this process. I intend to spend the rest of my years demonstrating my gratitude to all of you. Kids, my hope for each of you is that you pursue your education, your passions, and your soul mates relentlessly. Anything less, you are cheating yourselves.*

*With all of my love, Thank You!*

### Acknowledgements

With great appreciation and admiration to:

My committee – your guidance and support have meant everything to me. You knew when to push, when to stand back, when to criticize, when to praise. I have mentioned this before, but this was the first time in my educational journey that I felt like my writing had ever been critiqued so thoroughly. While sometimes tough to hear, every bit of it was purposeful, helpful, and useful...Thank you.

My parents, Frank and Charlotte – The love you have shown me all of my life serves as the model for how I aim to raise my own family. Throughout the process of managing this work, I have often reflected on your work ethic, your integrity, and your commitment to doing the right things well. Even though you have been on the sidelines of this project, you have been instrumental in its development, and I want you to know that...I wouldn't be here without you.

Bob – I have been angry with you for a quarter of a century now. I am not angry with you for what happened then, I am angry with you for everything since. I am angry that I have not had you in my life to celebrate life's achievements together: my playing career, my wedding, and the birth of my children, this project. While I may still and always be angry...I still and always will love you.

Coach Kill – I haven't played for you in two decades. I want you to know that ever since I met you, you have served as a role model for me in many facets of my life. I think of you more often than I should admit. As an athlete, a coach, now a leader of athletes and coaches, a husband, a father, and as a man, I have often compared myself to your standard. For that standard...thank you from me and from thousands of others.

AD's and Coaches – To those of you I have worked with and for, I express great gratitude. We are all a product of our own experiences. In my experiences with all of you, I have learned, I have grown, and I have developed. For my colleagues in the MIAAA, your work is under-appreciated by many, but not by me. Your work...OUR work is important, it is valuable, and it is critical that we do it well. Our greatest strength is each other and the bond we all share to provide great educational opportunities for our athletes...keep it up!

Students – I often tell people that I have the best job in education. I get to watch you fail, then grow; I get to watch you train, then play; I get to watch you play, then WIN! It is truly a thrill for me, and it is honor to work for you behind the scenes to make sure that your educational journey through athletics gives you all of the blessings that it has given me...God bless.

Dallas James Lintner

## Abstract

MEASURING THE PERCEIVED EFFECTIVENESS OF CONCUSSION  
LEGISLATION IN MICHIGAN'S SCHOOLS

By

Dallas James Lintner

Adviser: Mary Jo Finney, Ph.D.

Washington was the first state to pass legislation governing sport-related concussion in 2009. Since then, every other state in the nation has adopted similar legislation. The state of Michigan enacted its legislation in 2013. The purpose of the legislation was to educate the state's residents and provide direction for the leaders of amateur athletes and sport leaders in the state.

The purpose of this study was to measure the perceived effectiveness of the legislation on the reporting behavior of four constituent groups: athletes, coaches, officials, and parents in the state of Michigan. Data were collected from the state's practicing athletic administrators. The perception (the terms perception and belief are used interchangeably) of the athletic administrators was collected through a survey and individual interviews with practicing athletic administrators.

The results showed that the perceived reporting behavior of concussion events for all four constituent groups was positively impacted since the adoption of the state's legislation, although to varying degrees. Results also indicate that barriers to concussion event reporting still exist and that efforts to reintegrate an injured child to athletic competition are not equal to the efforts to reintegrate an injured child to the academic

learning environment. The conclusions of this study should be considered in future research and policy development to protect the safety and enhance the learning environment for child athletes.

*Keywords:* concussion, traumatic brain injury, concussion legislation,

## Table of Contents

Acknowledgements	4
Abstract	6
Table of Contents	8
List of Tables	10
List of Figures	11
Chapter One: Introduction	12
Background of the Problem	12
The Problem	14
Definition of Terms	17
Purpose of the Study	18
Research Questions	19
Conclusion	20
Chapter Two: Review of the Literature	21
Social Psychology	21
Theory of Reasoned Action	23
Theory of Planned Behavior	24
Operant Conditioning	26
Social Identity Theory	28
Diagnostics and Assessment through Educational Supports	32
RTP and RTL Protocols	33
School Health and Safety Obligations	35
Reporting Behavior	37
Legislative Development Nationally	40
Michigan's Legislation	43
Conclusion	45
Chapter Three: Methodology	46
Research Design	46
Participants	47
Instrumentation	47
Research Procedures and Pilot Testing	49
Analytic Method	50
Summary	51
Chapter Four: Findings	53
Demographic Detail of Participants	53
Categorization of survey participants	54
Reporting Behavior of Constituent Groups	56
Survey findings	56
Interview findings	57
Awareness of Concussion Events	60
Survey findings	60



Interview findings	62
Traditional Barriers to Concussion Event Reporting	64
Survey findings	64
Interview findings	65
Chapter Five: Interpretations	68
Reporting Behavior of Constituent Groups	68
Awareness of Concussion Events	71
Traditional Barriers to Concussion Event Reporting	74
Implications of the Study	75
Limitations of the Study	77
Future Research	78
Conclusion	80
References	82
Appendix A	88
Appendix B	90
Appendix C	91
Appendix D	92
Appendix E	96
Appendix F	97

## List of Tables

Table 1.	Reasons for and Against Concussion Symptom Reporting	39
Table 2.	Demographic Detail of Survey Respondents	54
Table 3.	Forms of Advanced Medical Training of Athletic Administrators	55
Table 4.	Athletic Administrator Perception of Legislative Impact on Constituent Group Reporting Behavior	57
Table 5.	Impact of Legislation on Reporting Behavior of Constituent Groups	59
Table 6.	Methods of Reporting Instances of TBI to Athletic Administrators	61
Table 7.	Athletic Administrator Perception of Individuals Involved in Aftercare of Athletes Suffering TBI	62
Table 8.	Sources of Reports to Athletic Administrators of Instances of TBI	63
Table 9.	Athletic Administrator Survey Responses to True/False Statements Regarding Barriers to Concussion Event Reporting	65

List of Figures

Figure 1.	2012-2014 Percentages of TBI in MHSAA Tournament Sports	16
Figure 2.	Percentage of States with Removal from Play Criteria	43

## **Chapter One: Introduction**

### **Background of the Problem**

As long as there has been athletic competition, there has been athletic injury. Homer describes head injuries as early as the ninth century B.C. In the Iliad, Homer describes a boxing match between Epeus and Eurylus in which he writes, “But noble Epeus caught hold of him and raised him up; his comrades also came ‘round him and led him from the ring, unsteady in his gait, his head hanging on one side, and spitting great clots of gore. They set him down in a swoon and then went to fetch the double cup” (Homer & Rouse, 1963, p. 295). This passage is possibly the first written record of a sports-related injury and possibly the first documented example of an athletic concussion. Rhazes, a Persian physician, may be the first medical professional to acknowledge sport concussions as early as 900 A.D. as a, “transient impairment of mental status following a jolt to the head” (Carroll & Rosner, 2011, p. 11).

Concussions are classified as mild traumatic brain injuries (TBI). Changes in blood flow to the brain or metabolic brain changes are important components in the pathophysiology of TBI (Bourna & Muizelaar, 1995). While TBI comes in many forms and is a classification of disability for special education services, for this study, the scope of TBI is limited to sport-related concussions.

TBI has often been referred to in athletics as the, “silent epidemic” (Davies, 2011, p. 1) due to its often subtle and covert symptom manifestations and the frequency by which symptoms have been ignored and unreported due to fear of being withheld from athletic participation. It is estimated that nearly 500,000 of reported sports-related concussions concerned children ages 0-14 (Davies, 2011). Of these children, females

suffer higher rates of TBI than males, with girls' soccer ranking the highest in TBI as a percentage of all sports injuries, followed by girls' basketball, football, and boys' soccer (Staurowsky, et al., 2009).

Brain injuries, including sports-related brain injuries, are the leading cause of death and disability for children and adolescents ages 0-19 years in America (Canto, Chesire, & Buckley, 2011). Most instances of TBI are not reported to school personnel for academic support and school counselors and psychologists have little to no training and awareness of the progression protocol to return a student to the learning environment following a brain injury (Canto et al., 2011). In the school years 2012-13 through 2014-2015, the Michigan High School Athletic Association (MHSAA) received 523 reports of athletes being removed from participation for suspected concussions (Appendix A). Until August 2015, neither the MHSAA nor any Michigan or local governing body required official reporting of instances of children suffering symptoms of TBI. The only requirement for reporting in Michigan had been from MHSAA-registered athletic officials when a participant was removed from a contest during one of its state tournament events. Since the fall of 2015, the MHSAA has developed a system to track all instances of concussion events for all athletes in all sports suspected in practice or contests (J. E. Roberts, personal communication, April 15, 2014).

Former NFL players have reported symptoms years after completion of their careers and a study initiated in 2008 reports that 96% of former players' brains examined showed signs of extreme brain injury (Hannah, Goldschmidt, & Flower, 2015). In this study, former NFL players had agreed to have their brains examined following their death for injuries that could be attributed to their participation in professional football. In 2015, a class-action settlement involving more than 5,000 former NFL players awarded

damages that ranged from 1.5 million to five million dollars to those injured (Almasy & Martin, 2015).

### **The Problem**

In recent history throughout all levels of competitive sport and recreational athletics, TBI is at the forefront of concern regarding the health and safety of athletes, as it is the common athletically related head injury (Guskiewicz, Weaver, Padua, & Garrett, 2000). Davies (2011) argues that it has long been the tradition for symptoms of TBI to go unreported so concussion instances go undiagnosed and, therefore, injuries are left untreated. A 2006 Center for Disease Control (CDC) study reported that between 1.6 and 3.8 million estimated cases of TBI occur in the United States annually due to the ineffectiveness of adequate education for athletes, coaches, and families about the importance of concussion awareness and potential for severe injury (McAvoy, 2012).

Both the short and long-term effects of TBI are what have compelled states to pass legislation, sport governing bodies to create safety protocols, and educational institutions to inform athletes and parents of the symptoms, risks, and treatments of these head injuries. Some symptoms of TBI include dizziness, blurry vision, confusion, noise sensitivity, and more severe symptoms including memory loss, loss of consciousness, and depression. Symptoms may be immediately present while others may take longer to manifest. Headaches are the most common symptom of TBI and have been present at the time of injury in 94% of all TBI diagnosed by medical professionals while loss of consciousness has been reported as the least common symptom occurring in only 13% of TBI (Wallace, 2015). Loss of consciousness may be the most severe and immediate symptom of TBI and some medical professionals still operate with the understanding that

loss of consciousness must take place for a concussion to have occurred which is a point of disagreement between some in the medical field (Register-Mihalik, 2010).

Since 2009, all fifty states including the District of Columbia have enacted legislation that requires concussion awareness programming and protocols to reintegrate injured athletes into competition. Michigan passed its legislation in the summer of 2012. The state of Michigan lacks a centralized repository for collection and synthesis of TBI instances, which makes assessing the effectiveness of the legislation difficult. In August of 2015, the MHSAA created a database for its member schools' athletic administrators to document and store instances of TBI suffered by athletes in practice and competition. While local athletic administrators have access to their own local data, statewide information is yet to be publically available.

Prior to 2015, the MHSAA only collected data from athletes removed from play in their end-of-season tournament contests. This data excludes instances of TBI from regular-season contests or practice sessions. A basketball team, for example, may play as many as eight contests throughout these tournaments where instances of TBI would have been recorded and reported. Twenty regular-season contests as well as dozens of potential practice sessions would not have had the opportunity for data collection of these injuries. A football team may not have any instances of TBI reported if their team did not qualify for the state playoff tournament, despite nine regular-season games, and nearly 50 practice sessions. Figure 1 indicates that in the school years of 2012-2013, 2013-2014, and 2014-2015 39% of all reported TBI occurred during football contests. Further examination identifies that incidences of TBIs in boys' soccer (23%) and girls' soccer (16%) combined accounted for an identical percentage of injuries. Assuming that the sports of soccer and football are similar in the number of TBI would be misleading since

all soccer teams in Michigan are entered into the state tournaments where data is collected yet only the most successful football teams are qualified for the state playoff tournament. Beginning with the 2015-2016 school year, data collected from all sports regarding TBI in practice sessions and all competitions will likely yield more specific and accurate measurements.

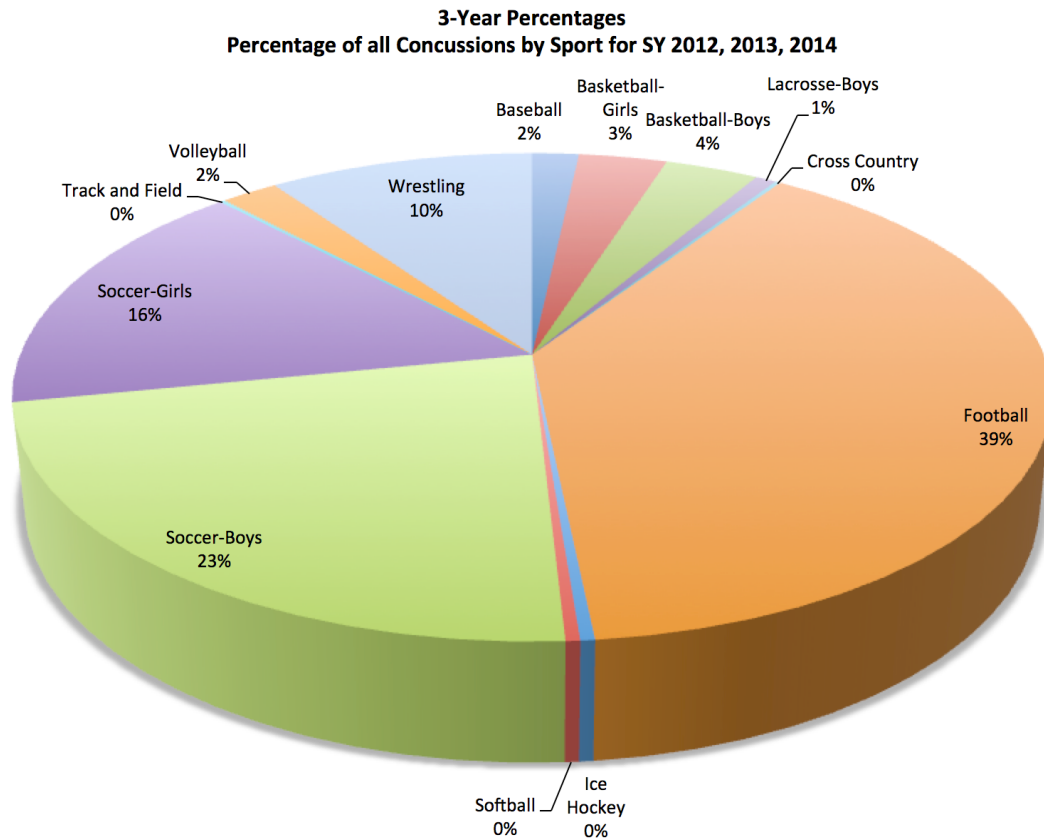


Figure 1. 2012-2014 Percentages of TBI in MHSAA tournament sports. (M. Uyl, personal communication, April 15, 2014), J. Roberts (personal communication, July 14, 2015).

The effectiveness of Michigan’s concussion legislation has yet to be measured. Michigan’s legislation requires students, coaches, players, and parents to be educated about TBI and defines protocol by which injured athletes are to be reintegrated into athletic participation. The educational components must include signs and symptoms of



concussions to assist in identifying potential injuries that should be reported for medical evaluation. The legislation also requires that parents or guardians must acknowledge receipt of these educational materials (Michigan Department of Community Health, 2012). The problem faced with measuring the effectiveness of the legislation is that limited concussion data exist to determine the effect that the state's laws might be having on the reporting of TBI among athletes in Michigan since their passage in the legislature.

### **Definition of Terms**

1. Athletic administrator – The sole individual in a school district responsible for the supervision and management of a school's athletic program. This term is also synonymous with the terms, "athletic director," "athletic supervisor," or, "athletic coordinator." These terms are often used interchangeably but, for clarity, in this study athletic administrator will be used.
2. Bell-ringer – a common, colloquial term described as a momentary state of confusion or disorientation. The term, "ding" is similarly used.
3. Concussion - a complex pathophysiological process affecting the brain, induced by biomechanical forces" (McCrory et al., 2013, p. 1).
4. Concussion event - the presence of concussion symptoms, the medical diagnosis of a TBI, or both.
5. Return to Learn (RTL) protocol – progression of steps and interventions intended to safely reintegrate an injured student into full academic participation.
6. Return to Play (RTP) protocol – progression of steps and interventions intended to safely reintegrate an injured athlete into full athletic participation.
7. Traumatic Brain Injury (TBI) - an alteration in brain function, or other evidence of brain pathology, caused by an external force (Menon, Schwab, Wright, &

Maas, (2010). This term will be used synonymously with the term concussion in this study.

### **Purpose of the Study**

The purpose of this study is to measure the impact of concussion legislation in Michigan on adherence to TBI reporting and protocols among constituent groups involved in interscholastic contact sports. The legislative framework in Michigan details the specific responsibilities of Michigan's schools and school leaders in adhering to mandates. Neither the legislation nor any state agency track data that can be used to measure the effectiveness of the legislation and its impact on athletes in the state's school systems. Neither the Center for Disease Control nor the Michigan Department of Community Health record data related to sport-related concussions. The MHSAA database is intended to record all instances of TBI among its member schools (MHSAA, 2015). The MHSAA records instances of TBI among athletes and stratifies that data according to the gender of the athlete, the sport of participation, the circumstances of the injury, and the duration that affected athletes have been withheld from participation, among other items.

This study looks to provide data regarding the impact of the current legislation on the recording and tracking of concussion event data. Given the short and long term consequence of TBI to a young athlete's life and since the law does not specify requirements for reporting concussion events or a manner in which schools and sport leaders are to be monitored for their adherence to the law, it is imperative that a study of the efficacy of the law in compelling the reporting of injuries and the initiation of Return To Play (RTP) protocol be undertaken.

**Research Questions**

Measuring the impact of concussion legislation in Michigan's schools is difficult. Not until August of 2015 have concussion event data been recorded and tracked in a centralized repository and this data is currently only accessible to the local athletic administrators that report concussion events. The constituent groups in the state's school athletic programs (athletes, coaches, officials, parents) cannot yet be assessed with quantifiable data, yet perception data can be collected and recorded. Prior to this study, no evidence was found that any individual or group associated with Michigan's state government or the MHSAA has published data reporting the level of effectiveness of the state's legislation, or the concussion event reporting behavior of the constituent groups included in this study.

Athletic administrators in Michigan are frequently engaged with all four constituent groups in interscholastic athletic programs. Their perceptions, therefore, can be collected and quantified to provide initial data that measure the effectiveness of Michigan's legislation. This study looks to determine the perception of Michigan's athletic administrators through a written survey instrument and a qualitative interview.

The following research questions were explored: [1] To what extent do athletic administrators perceive concussion legislation has impacted the reporting of concussion events by constituent groups (athletes, coaches, officials, parents)? [2] In what ways do athletic administrators become aware of the reporting of concussion events among constituent groups (athletes, coaches, officials, parents)? [3] To what extent do athletic administrators perceive concussion legislation is challenging traditional beliefs and practices about concussion event under-reporting?

Data were gathered in two forms: [1] A written survey was administered to all registered athletic administrators in the State of Michigan measuring their perceptions of each constituent group's adherence to the legislation. [2] Survey participants were given the option to participate in an individual oral interview to expand upon survey topics. Interview subjects provided the researcher with personal examples to clarify their perceptions through a series of open-ended questions to collect qualitative data regarding survey topics.

### **Conclusion**

This study in assessing perceived adherence to legislation mandating the reporting of TBI and following RTP protocol is intended to provide information as to its efficacy in protecting young athletes. Further, results may increase awareness of the importance of legislation in ensuring the health and safety of young athletes through sound educational programming and knowledge-sharing among the interscholastic athletic community.

## **Chapter Two: Review of the Literature**

### **Social Psychology**

Ajzen (1985) offers insight as to how psychological principles can be linked to aid in protecting the safety of the student-athlete through behavioral understanding. From this lens, awareness of participants and observers can be utilized to better identify symptoms of TBI and increase the likelihood of participants identifying and reporting symptoms to medical personnel and begin treatment of their injuries. Ajzen's work, which is detailed further in this chapter explains the principles by which people make decisions about their behavior and can be used to better understand why an athlete may or may not report a concussion event.

In recent years, heightened awareness of brain injuries and their dangers has increased the focus and attention of athletes, parents, and spectators on these injuries while efforts by competitive sport organizers to educate themselves and others to recognize, assess, treat, and rehabilitate athletes suffering from TBI have been aimed at increasing positive treatment outcomes (Coronado et al., 2015). Organizations such as the MHSAA (2015) offer detailed educational programs and medical protocol for TBI management. Many athletic programs and state legislative mandates require education and increased awareness of concussion symptoms and treatment protocols for athletes, families, parents, and coaches. In the state of Michigan, no studies were found to have measured the impact that concussion education and management programs have had on the frequency by which instances of concussion events are reported to school or medical personnel. Michigan Department of Community Health, Michigan Department of Education, and ERIC database queries failed to yield information related to the reporting

behavior of concussion events using the following keywords: (Michigan *and* concussion reporting, TBI reports, high school athlete concussion reports, concussion symptom awareness, return to play protocol, or concussion reporting behavior).

It is important that athletic constituent groups consisting of athletes, parents, coaches, and administrators be involved with the topic of sport concussions. TBI are no longer just a concern of the medical profession. Educators play a role in the diagnosis, evaluation, treatment, and aftercare programs for children suffering TBI, particularly those related to athletic participation. The importance of educational programming for leaders in the field of athletics is essential to protecting children. There are several components of concussion assessment and management where educators are now becoming involved, including concussion education, diagnostics, assessment, and protocols for returning to play and returning to learning. Athletic administrators and coaches are becoming more involved as a conduit between athletes, their families, and their physicians.

The layperson, without specialized education or training, may find it difficult to understand the cumulative effects of concussions and the long-lasting effects they may have physically, psychologically, emotionally, academically, and cognitively. Agencies such as the CDC and the Government Accounting Office agree that increased attention in educating the public and participants about the symptoms and impact of concussions is imperative (Kohn, 2010; Mitchko, Huitric, Sarmiento, Hayes, Pruzan, & Sawyer, 2007). Michigan's legislation addresses three major target areas: development of educational materials, process of educational acknowledgement and coach qualification, and the protocols by which athletes are removed from and returned to activity (Michigan Department of Community Health, 2012).

Concussions are one type of TBI that affects children as well as adults. The Center for Disease Control estimate of annual cases of sport-related concussions has a wide range due to the fact that many instances of concussions do not get reported. For generations, concussions, and their symptoms have often been dismissed by phrases such as, “he just got his bell rung” or “she just got dinged” (McAvoy, 2012, p.1). These dismissals are likely coupled with the concept that many athletes are reluctant to report symptoms or injury for fear of removal from play for an extended period of time. These two concerns may lead one to argue that increased efforts for more education and accountability of those entrusted with the welfare of children are necessary. Specifically, athletic coaches are a group who need increased awareness into identifying symptoms and manifestations of TBI, as they are an important first line of protection for the medical safety of their players.

### **Theory of Reasoned Action**

The conscious decision of an athlete to report instances of TBI may be connected to his attitudes, perceptions, and influences from others, including his parents. These factors may impact his choice to conceal or to reveal the presence of injury. In an effort to better understand the relationship between attitudes and behavior, Fishbein and Ajzen (1975) developed the theory of reasoned action (TRA). The simple explanation of TRA is that behavior intention (BI) can be predicted by measuring the connection between the attitude (A) toward performing the behavior (B) and one's own subjective norms (SN) involved; with weighting (W) being defined by the individual regarding their importance toward the behavior being considered. Fishbein and Ajzen (1975) explain TRA through the equation:  $BI = (AB) W_1 + (SN) W_2$ . Where: *BI* = behavioral intention, *(AB)* = one's attitude toward performing the behavior, *W* = individually derived weights, and *SN* =

one's subjective norm related to performing the behavior. In the context of reporting TBI, this formula can be simplified through an adjustment of terminology to the equation:  $R = B_s + E_s$ . In this adjusted version,  $R$  = reporting instances of injury or symptoms;  $B_s$  = the strength of the individual's belief in reporting the injury or symptoms; and  $E_s$  = the strength of the expectation of reporting the injury or symptoms.

In the context of high school athletes suffering concussions or any blow to the head, Fishbein and Ajzen's work can be used to gauge whether or not an athlete suffering a concussion is likely to report symptoms to parents, coaches, or medical personnel. Their formula can be used to predict the outcome behavior of reporting symptoms by measuring the strength of the athlete's weight of importance in reporting symptoms, coupled with his attitude about the effects that his report may have on him athletically. Simply stated, if the athlete feels strongly enough ( $W$ ) that his health and safety ( $SN$ ) are worth reporting symptoms more than concealing the injury to continue athletic participation; he is likely to report the injury or symptoms ( $BI$ ).

### **Theory of Planned Behavior**

Over time, the theory of reasoned action evolved into the theory of planned behavior (TPB). Using the previous theory, coupled with continued research, Ajzen (1985) added an additional component to the formula used to predict behaviors based on attitudes. Using the existing formula, Ajzen calculated the product of  $(AB) W_1 + (SN) W_2$ , and divided that number by the calculated level of perceived behavioral control (PBC). The operational definition of perceived behavioral control is the ability and willingness to accomplish a task, reach a goal, or complete the desired behavior (Ajzen, 1985). This update accounted for the ability of the individual to be able to carry out a desired behavior. For example, an athlete may find value in reporting symptoms of TBI



if he feels that his fellow athletic constituent groups will support his decision to report the symptoms. This value in reporting is further explored in the discussion of social identity theory. Through the lens of TPB and the high school athlete, the connection between the desires to report TBI coupled with the subjective norms associated with the injury now include the athlete's ability to actually report the injury. Many schools with interscholastic athletic programs have on-site medical personnel from doctors to nurses to certified athletic trainers. Other schools may not have such personnel. Often non-collision sports do not benefit from such on-site personnel making the reporting of symptoms or a blow to the head inexpedient.

Wallace's work (2015) on concussion reporting behavior describes the decline of reporting rates in schools where on-site medical personnel are not present at the time of injury. For these reasons, it may be difficult for an athlete to report a TBI. In effect, the calculation of TPB in the formula developed by Ajzen may have a low PBC. An example would include the high school tennis player that is struck in the head by a tennis ball. Often medical personnel, including athletic trainers, are not immediately accessible to evaluate an athlete's condition or provide the athlete an opportunity to report symptoms. In this example, an athlete may only report the injury to parents or no one at all. The athlete might value the importance of reporting the injury (AB), have a lower calculation of subjective norms from home (SN), and a lower value of PBC; in effect leading the athlete to not report symptoms, and the injury to persist untreated and unmonitored. To relate the equation of the theory of planned behavior to reporting of TBI, we can use the adjusted formula:  $R = (B_s + E_s) / A$ . Similar to the theory of planned behavior, we can simply use the sum of  $B_s + E_s$ , and divide it by A, where A refers to the

ability to report the injury.  $B_s + E_s$  would still refer to the strength of belief and expectation of the individual in reporting TBI or symptoms, or R.

### **Operant Conditioning**

Fishbein and Ajzen's work (1975) also provides insight as to why athletes may not report concussion symptoms. The failure of athletes to report symptoms or possible TBI may have more to do with conditioning than with planned behavior. In their work, Fishbein and Ajzen describe the relationship between the unconditioned stimulus (UCS), the unconditioned response (UCR), and the conditioned stimuli (CS). Fishbein and Ajzen provide an example where a young child may elicit a behavior pattern of fear or anxiety at the sight of an earthworm on wet pavement. The child may not understand that the frightening object is called a worm. In this example, the worm signifies the unconditioned stimulus, as it is the object by which a response is prompted. The worm triggers a response of fright by screaming or avoidance. By associating the object with the name of worm, the spoken word now becomes a conditioned stimulus. While the word alone has no effect on the child, once an association has been made between the word and the object, the behavior or UCR is the same. Fishbein and Ajzen (1975) claim that, "...most important are the frequency with which the CS and UCS are paired" (p. 22). As the child begins to associate the word [worm] more often with the object, the term can now have the same force as the object; "Once the CS comes to elicit the UCR, it becomes the UCS" (Fishbein & Ajzen, 1975, p. 22). The child will begin to present the same behaviors of fear and anxiety simply from speaking the word as s/he would if a worm was actually present. Through the athletic lens, TBI education can serve as the CS. Once the reporting of concussion events becomes the UCR, then TBI education can

become the unconditioned stimulus to elicit the desired behavior of reporting concussion events.

The understanding of operant conditioning can also be applied to high school athletes and the reporting of concussion symptoms and injuries. As the educational programs and awareness of brain injuries for athletes bring more attention to athletes, coaches, parents, and educational and athletic leadership, the same type of association may also take place. For decades, many concussion injuries have been largely ignored, undiagnosed and untreated. Terms like “having his bell rung” and “being knocked silly” have been used to describe possible concussions, which are to be combatted with toughness, machismo, and commitment to athletic participation at all costs. It can be debated that these types of cultural norms, coupled with a lack of information about TBI, have led to several generations of misunderstanding regarding the severity of these types of injuries.

The role of concussion assessment and management educational programs is to associate the awareness of athletic participants and observers with the types of injuries that may result from participation. In effect, the educational programs are intended to serve as the conditioned stimuli to elicit an unconditioned response. Parallel to Fishbein and Ajzen's model (1975) where the unconditioned stimulus elicits an automatic unconditioned response, a similar scenario can be developed. If an athlete knew without question that his/her current medical status could cause learning difficulties, permanent brain damage, even death, the likelihood of future athletic participation would be minimal, if at all. The certainty of severe learning and medical difficulties would likely automatically elicit the response of non-participation. In this case, the medical state would serve as the UCS and the non-participation would serve as the UCR. The role of

concussion management educational programs is to serve as the CS. As participants and observers learn about the relationship between symptoms of concussion and the possibility of severe learning and medical drawbacks, the symptoms now become associated with the behavior; the CS now becomes the UCS. The athlete now begins to learn that symptoms of concussion (CS) can lead to permanent brain damage, even death, and therefore is more likely to report symptoms and is voluntarily withheld from participation (UCR). Fishbein and Ajzen (1975) argue that, "When a new concept is learned, an attitude toward that concept is acquired simultaneously" (p. 27). The connection between operant conditioning principles and the theory of planned behavior can lead to continued improvement of student athletes' reporting instances of TBI.

### **Social Identity Theory**

Being a member of a group can impact behavior, and membership within a group can be affected by numerous elements. Posten (1998) quotes Green Bay Packers fan, Steve Gay as saying, "The Packers are like your children. You don't love them because they're good. You love them because they're yours" (p. 1). Tajfel (1974) developed the social identity theory as a way to predict or understand behavior within a group based on the perceived status of individuals within the group. Organizations, teams, and families can often be divided between what social identity theory describes as in-group or out-group or "us" or "them" members (McLeod, 2008).

In interscholastic athletics, the in-group members of the group may contain the home team, and the out-group members may contain the visiting team. Within a team, the members of the in-group could be considered as the healthy participating members of the team, while the out-group members could be considered the members that are not actively participating due to injury, particularly TBI. This phenomenon of group

membership, coupled with the theory of reasoned action and the theory of planned behavior, may explain why some adolescents do or do not report concussion events.

Social categorization, identification, and comparison, which are detailed later in this section, are three mental processes that are involved in placement into in-groups or out-groups (McLeod, 2008). Group members are categorized according to the acceptable behaviors and norms of the groups to which they belong. An individual's behavior may be acceptable within the membership of one group and not another. For example, a member of a wrestling team may be expected to be physically aggressive during competition yet subdued and passive in a classroom environment. Individuals who identify with the acceptable behavior norms of the group often see a boost in self-esteem and those who do not may often experience lower self-esteem, become hostile, or find themselves re-categorized as out-group members, forcing comparative subgroups within the team or organization (McLeod, 2008).

Self-esteem among group members is directly impacted by their classification as either an in-group or out-group member. A group member with lower self-esteem, or a member whose status has devolved from an in-group to an out-group status can make the member feel alone, isolated, and feel a deep anxiety (Posten, 1998). An athlete within a team may have experiences throughout a competitive sport season that may impact their self-esteem positively or negatively. Whether an individual's self-esteem fluctuates or is static, group membership contributes positively or negatively to the image the individual has of himself (Tajfel, 1974). Within an athletic team, members who may sporadically adhere to the groups' established behavioral norms or demonstrate varying levels of adherence may experience changes in self-esteem. Members of the out-group, or marginal members of the in-group are likely to be liked less than the more centrally

grounded members of the group (Hogg & Terry, 2000). A team member who is not contributing to the success of the team at the expected level or an injured athlete may become one of the marginal members of the group.

The identification of members within a group may affect their behavior and likelihood of reporting concussion events. A team member is more likely to report TBI instances when the attributes of the group are applicable to the member's own self-concept (Fink, Parker, Brett, & Higgins, 2009). Tajfel (1974) argues, "It is the choice by the subjects of these particular norms based on these particular reinforcements which defines the problem and provides a point of departure for some research questions about the psychology of intergroup relations" (p. 68). He also suggests it is unlikely that intergroup relations are static and unchanging and that social relationships within a group can be adjusted. This notion is applicable to Fishbein & Ajzen's work (1975) in the theory of planned behavior, that the social norms of the group can change, and the group member's behavior intention may change as well. When the acceptable behavior of the group includes the concept that team members experiencing symptoms of TBI should report those symptoms, the athlete can feel comfortable reporting the injury without compromising self-esteem or risk re-classification as an out-group member of the team. Without this comfort, it is difficult for group members to conceive of the possibility of betraying the group by reporting symptoms and voluntarily risk moving himself or herself to the out-group (Tajfel & Turner, 1979).

Group membership can be both relational and comparative, and members can be considered as better or worse, similar or different, and more or less valuable than other members (Tajfel & Turner, 1979). This can lead to conflict between the group members and significantly affect team dynamics. Once an in-group has made distinctions from an

out-group, it is possible for members to hate, dislike, and discriminate against each other (Tajfel, 1974). Once these distinctions have been made, team dynamics can further impede the willingness of an injured athlete reporting their concussion event. The more that in-group members are steadfast in their belief system, the more uniformity they will demonstrate in their behavior toward out-group members (Tajfel & Turner, 1979). Marques, Yzerbyt, and Leyens (1988) defend this concept and add that out-group members may even feel ashamed for a negative event like a teammate suffering a TBI, even if they are not responsible for it. These members may be derogated by the group and labeled as different. This type of intergroup conflict is what Marques et al describes as the, "Black Sheep Effect" (1988).

Conflict within the team group is the most severe when it impacts educational and ethical values, or membership within the team. If a win-at-all-costs mentality is an acceptable norm within an in-group, team members may feel compelled to make unethical decisions, like cheating, not reporting TBI instances, or encouraging other team members to do so. When teams are divided among in-group and out-group members, the out-group members may resent or become hostile toward in-group members when they feel they have been deprived of the reward of sport participation or that their interaction with the other in-group team members has become compromised (Tajfel & Turner, 1979). This can lead to team members leaving the group and ending their association with their sport team. If a group does not satisfactorily meet the needs of the individual, the member may leave the group if possible unless there is a change in the, "...attributes of the group so that its unwelcome features are either justified or made acceptable through reinterpretation" (Tajfel, 1974, p. 70). It is at this juncture that it can be argued that Michigan's concussion legislation can impact the educational interests of

interscholastic team management and can influence the culture of amateur athletics to include the notion that reporting concussion events is not only responsible, but acceptable behavior according to group norms; thus, protecting the self-esteem and health and safety of the individual. Understanding the psychological principles behind human behavior can aid educators and athletic leaders in advancing the effectiveness of Michigan's legislation regarding concussions in school-sponsored athletic programs.

### **Diagnostics and Assessment through Educational Supports**

Schools across America may employ certified athletic trainers that are involved in the process of diagnosing TBI. It is common that schools employing athletic trainers complete baseline testing of athletes prior to athletic participation (Erdal, 2012). Calculation of baseline data collection may vary based on the hardware and software systems available, but several themes of data are consistent, including: a varying form of a symptoms checklist, a balance assessment, and a memory assessment. To administer, evaluate, and store baseline data, schools may employ electronic tools, handwritten tools, or both.

Athletic trainers and medical personnel can use baseline data to compare with future assessments when athletes are suspected of suffering a TBI (Kelly & Rosenberg, 1997). Often, medical personnel who diagnose and treat concussions use a variance of scores between baseline data and post-incident scores. The same assessments can also be used to evaluate an athlete's progress through a treatment program. Schools and athletic trainers may not be equipped with the necessary tools to completely diagnose TBI, but the use of data assessments can be helpful in referring patients to medical doctors for more accurate evaluation.



Although the diagnosis of TBI can be difficult based on the symptoms present at the time of injury, assessment by medical staff can provide a more detailed analysis of the severity of the injury. For example, medical evaluations, "...cannot only assess damage to the impact area, known as the coup, but can also analyze damage to the point on the brain opposite of impact, known as the countercoup to assess the totality of the injury" (Canto et al., 2011, p.36). This type of injury evaluation is possible through medical evaluation, and not possible by any sideline evaluation performed at the time of injury. Accurately defining TBI instances can also be difficult. Citing the CDC's 2007 review of 1.7 million reported concussions, 80% resulted in emergency room visits, 16% in hospitalization, and 3% in death. The results may be skewed due to under-reporting of injuries (Davies, 2011). Langlois, Rutland-Brown & Thomas (2005) also acknowledge the presence of under-reporting of TBI and estimate that the actual number of instances to be as high as 3.8 million cases annually.

### **RTP and RTL Protocols**

It is not uncommon for parents and athletes to be concerned with the timeline by which medical personnel will allow injured athletes to return to full participation. Aside from athletic participation limitations, athletes suffering TBI must follow a prescribed RTP and RTL protocol. RTP protocols may vary in detail; however, there are certain consistencies in the progression of an athlete suffering a TBI to return to competition (Faure & Pemberton, 2010; Piebes, S.K., Gourley, M., & Valovich McLeod, T.C., 2009; Stewart, 2012). Research consistently affirms that the first step is returning to light aerobic (non-contact) exercise for short intervals. The second step is moderate (non-contact) exercise, usually comprised of running, bicycling, and strength training. The third step is high intensity exercise, still without contact, including sprinting, agility

work, and conditioning. The fourth step is full practice with contact, and the fifth stage is full competition. These stages are a prescribed process that must be individually tailored to an athlete and monitored to determine when an athlete is safely ready to proceed to the next step. At any time, should symptoms re-emerge, an athlete will restart the RTP process at the no activity phase.

Schools may also employ similar protocols for young athletes as students, and provide interventions to protect their cognitive functions in the learning environment. McAvoy (2012) describes how RTL protocols follow a similar continuum of progression and accommodations for a student's reentry to a full and rigorous learning environment, although the progression is individualized to meet individual students' learning needs and accommodations. Brady and Brady (2011) identify several important factors of RTL that school administrators and teachers should monitor and develop in concert with the athlete and his or her family, including: a quiet and still environment in a light-controlled and climate-controlled environment; a reduced academic task load, including the delay of major standardized assessments and examinations; written task instructions, and also a potentially reduced school day or week. McAvoy (2012) describes RTL protocol as a process similar to RTP that gradually advances a student to return to a full academic status through a prescribed progression. In this progression, McAvoy describes several interventions that may benefit students as they reacclimatize to full academic status while continuing their athletic rehabilitation. It is important to note that the RTP and RTL protocols can progress independently from one another. Some of the academic interventions include: "extra time on assignments; frequent breaks from tasks; daily checklists of tasks to complete; written daily schedules with times and locations; and avoidance of significant assessments like the ACT or SAT" (McAvoy, 2012, p. 24).

Using educational programs, such as the CDC's Head's Up program (Stewart, 2012), the athletic administrator, athletic coach, student participant, and parent can increase their individual capacity to monitor, identify, and assess symptoms of concussions that can severely impair educational and athletic participation and impair student-athletes' ability to perform many life functions. Concussions are not new to competitive sports but these injuries have seen an increase in education and attention which has regulated how educators and organizers of amateur athletics must review and demonstrate competency in the assessment and management of TBI.

The primary goal of concussion education programs is not only to educate individuals, but also to protect the health and safety of children participating in athletic programs (Covassin, Elbin, & Sarmiento, 2012). Many states and sport administration organizations have adopted concussion management, RTP, RTL, and assessment protocols that are very similar in detail (Tomei, Doe, Prestigiacomio, & Gandhi, 2012). The most significantly consistent challenge is increasing awareness of TBI and encouraging victims of injury and those responsible for the care of children to report and treat the injury.

### **School Health and Safety Obligations**

Schools fill many roles in the development of children academically, socially, psychologically, and sometimes spiritually. Schools are also required to enact policies and procedures to protect the health and safety of pupils. Michigan's legislature has enacted laws that require schools to record and report conditions that can be detrimental to the health and safety of children.

There is some legislative history setting precedent for injury prevention legislation. The most commonly accepted injury prevention legislation involves seat belt

requirements for motorists in America. States often vary in their requirements in their seat belt laws. In some states, drivers can be cited simply for not wearing seat belts, while in others, it is a secondary offense, only cited when drivers are stopped for other reasons. Many states also have requirements concerning motorcycle helmets or child-safety seats and restraints; restricting where and how children should sit in a vehicle. Legislation aimed at preventing TBI is another instance of legislative action enacted to prevent citizens from injury.

In Michigan, many public health and social workers are identified as mandated reporters. Mandated reporters are required to report instances of child abuse or neglect, most often to the office of Child Protective Services, a division of the Department of Human Services. In Michigan, school employees are also identified as mandated reporters, including teachers, administrators, school social workers and counselors (Michigan Department of Health and Human Services, 2015). Furthermore, Michigan requires mandated reporters to report abuse or neglect whether an investigation proves or disproves the report or not while protecting the confidentiality of the individual making the report. In addition, the state declares that failure to file reports of abuse or neglect can lead to both criminal and civil charges against the mandated reporter. This legislation is indicative of the importance of school officials to report serious threats to the health and safety of children. Reports of TBI occurrence are not yet included in the threats of health and safety included in this legislation, however, the failure to record and report concussion events has yet to be tested in court in Michigan as of January 2016.

To prevent the spread of disease in schools and to track the development of various ailments in the state, Michigan also requires schools to regularly track, record, and report several communicable diseases to their local health departments. These

ailments include chicken pox, measles, rubella, hepatitis, scarlet fever, flu, and meningitis, among others (Michigan Department of Community Health, 2015). The state of Michigan identifies in their justification of the Michigan Communicable Disease Rules that, “The public health system depends upon these reports of diseases to monitor the health of the community and to provide the basis for preventive action” (Michigan Department of Health and Human Services, 2015). The sentiment of this statement relates to the development of legislation regarding sport concussions in Michigan and throughout America. An argument can be made that concussion events can and should be tracked throughout Michigan, outside of the MHSAA. Currently, there is no existing centralized repository of data so that identification and prevention of TBI can be included in the mechanics of current state health and safety reporting guidelines. As legislation at the state and national level are enacted and updated, the rationale of including TBI in the health and safety conversation can be included.

### **Reporting Behavior**

Register-Mihalik (2010) has used the work of Fishbein and Ajzen (1975) to study athletes and coaches during the 2009-2010 school year. Register-Mihalik’s work aimed to assess the knowledge, attitudes, and behaviors of athletes and coaches in concert with the reporting behaviors of each group. Register-Mihalik studied 167 high school athletes in both male and female contact sports along with 59 athletic coaches from a sample of 25 different high schools in nine different states (p. iii). In her work, Register-Mihalik identifies the major factors in increased reporting of concussion events to be: [1] increase in athlete knowledge and attitude, [2] increased intention to report incidents, [3] increased positive influence in social norms, and [4] decreased number of previous TBI (p. iii).

The survey instruments developed by Register-Mihalik were created to connect the work of Fishbein and Ajzen on the theory of reasoned action and the theory of planned behavior to the behavioral actions and decision-making of the high school athlete. Her work details the problem of under-reporting of concussion events by athletes to be as high as 49% for concussion events and 13% for the less severe, headache, or “bell-ringer” events (Register-Mihalik, 2010, p. 74).

Wallace (2015) studied 715 male and female athletes in urban and suburban Michigan regarding the knowledge and concussion reporting behaviors of athletes in relation to socio-economic standing, race, and access to school-provided certified athletic trainers. Similar to Register-Mihalik's work, Wallace suggests a high level of under-reporting of concussion events in Michigan and argues that Michigan's 55% under-reporting level may be linked to the presence of a certified athletic trainer. She argues that schools that employ a certified athletic trainer may be more likely to receive reports of TBI than those that do not. As more athletes gain access to athletic trainer services, Wallace suggests that the rate of under-reporting should be lower than 55%. As explained earlier, Ajzen's (1985) work on perceived behavior control relates to Wallace's argument regarding under-reporting levels. Without the presence of a certified athletic trainer, an athlete may be less likely to report symptoms of an injury because he doesn't feel he is able to report the incident to a qualified individual.

Wallace reports that of the 715 athletes surveyed, 331 have recalled having at least one concussion event in their lives in either a practice or a contest situation. Among those 331 athletes, only 21.4% attested that they reported each of their concussion events to an authoritative or medical figure. Furthermore, 29.3% reported to continued participation in a contest while experiencing signs and symptoms of TBI (Wallace, 2015).

The reasons for reporting or not reporting concussion events were included in Wallace's work. Table 1 illustrates the frequency by percentage for the top reasons for reporting concussion symptoms and the top reasons for not reporting those symptoms.

Table 1

*Reasons for and Against Concussion Symptom Reporting (Wallace, 2015)*

Reasons for Reporting	%	Reasons for Not Reporting	%
I thought I had a concussion.	17.2	I did not think it was serious.	33.7
I did not want further damage to my brain.	15.7	I did not want to lose playing time.	26.0
I was scared for my health/safety.	8.7	I did not want to let my team down.	19.9
I felt the same way I did when I had a previous concussion.	5.7	I did not want to have to go to the doctor.	14.7

Wallace also indicates that among athlete survey respondents, 30% stated that they continued to participate in practices and contests while experiencing signs and symptoms of concussion without reporting those signs and symptoms to anyone at the time. This trend in under-reporting by athletes of concussion events while maintaining participation has been reported in other studies as well (Chrisman, Quitiquit, & Rivara, 2013; Register-Mihalik, et al., 2013). These works share the sentiment that athletes are increasingly aware of concussion symptoms and the dangers of TBI, yet there are alarmingly high percentages of athletes who knowingly choose to participate in interscholastic athletic activities while symptomatic.

As Wallace (2015) suggests, survey respondents' reasons for not reporting concussion symptoms are of a higher percentage than respondents' reasons for reporting symptoms indicating that more athletes share the same reasons for choosing not to report symptoms than they do for reporting them. The similarity between Wallace's under-reporting rate of 55% in her study of Michigan athletes and Register-Mihalik's rate of 49% in her study of athletes in nine other states suggest that Michigan's athletes are a fair representation of under-reporting when compared to at least nine other states.

### **Legislative Development Nationally**

In October 2006, Zackery Lystedt, of Washington underwent the first of several surgeries to treat bleeding and swelling of the brain. He survives today with several impairments due to complications from his TBI. At age 13, Zackery was playing fullback for his high school football team when he suffered a blow to the head during a contest. Zackery was dazed for a few moments and never lost consciousness, and he was allowed to return to the game after halftime. Shortly after the game, Zackery collapsed and was transported to the local hospital where he was diagnosed with a concussion and began the first of many treatments for an injury that would impair him for the rest of his life. Zackery is one of many young athletes who have experienced such a life-altering injury. There have been other stories throughout America that have had similar complications or have ended in life-ending injuries. Zackery's story is unique because it led to the passage of EHB 1824 (Zackery Lystedt Law, 2009), the nation's first concussion law.

Within five years of passage of the Lystedt Law every state, including the District of Columbia, has passed similar versions of the law. With support and emphasis from the National Football League (NFL) through rule changes aimed at protecting players and the



frequent coverage from American media outlets, the trauma associated with TBI has come to the forefront of our attention and has become the focus of conversations about student-athlete safety across the country.

National databases cannot accurately estimate the number of confirmed TBI, due to insufficient reporting data (Kohn, 2010). The CDC's, "Head's Up Guide to Concussions" is widely considered to be the gold standard in educational material for American families, educators, and athletes on TBI and athletic concussions (Kohn, 2010). The concept of home concussion treatments for young athletes is gradually and consistently improving thereby removing long-standing norms of parental dismissal of symptoms to intentional focus on treating the injury. For example, it has long been the common yet inaccurate understanding of many parents that an athlete suffering a blow to the head should be awakened every few hours to monitor the child for cognitive function. The common fear had been that a possibly concussed athlete might experience fatal brain swelling if the child were to sleep for extended periods. Aside from extreme examples when the brain may actually swell, which would have little to do with lying down or sleeping. Dr. Karen McAvoy, director of the Center for Concussion at the Rocky Mountain Youth Sports Medicine Institute (2012) argues that brain cells need cognitive rest as much as possible and athletes should not have their sleep interrupted; rather sleeping should be encouraged. The importance of cognitive rest is a new point of emphasis that can reduce the chances of athletes suffering Second Impact Syndrome, which may cause severe cumulative neurologic and cognitive disabilities, or can even lead to death (Mitchko, et al., 2007).

In addition to the state of Washington, McAvoy (2012) has identified Oregon and Texas as other key states that have passed legislation that has helped frame legislative

language and policy for the rest of the country. States have passed similar legislation in several areas of focus for concussion legislation. Tomei, Doe, Prestigiacomo, & Gandhi (2012) indicate that all states have extended their legislation to public school districts, and most include post-secondary public universities and colleges. All states include language that define the roles of coaches and medical personnel in their policies regarding recognition of symptoms of concussion and the risks of sport participation and the possibility of participants' risk of TBI. Several states have included language that punishes schools and coaches for non-compliance with state laws. Tennessee, Pennsylvania, and Connecticut have procedures for revocation of coaches' licenses for violations and Massachusetts has enacted policies that can penalize school districts for violations (Tomei et al., 2012).

Passed in 2007, Senate Bill SB 82 (Texas Compiled Statutes, 2007) in Texas has language similar to that of many other states. SB 82 has added a feature unique to other states, in that it requires schools and youth sport entities to conduct an annual safety drill to address TBI management protocol (Faure & Pemberton, 2010). Strauss (2014) investigated state legislation throughout America, and identified key components of legislation unique to individual states, including SB 82 in Texas. In addition to SB 82, Rhode Island has a current bill in committee that would require baseline concussion testing of all amateur athletes that participate in contact sports (Strauss, 2014). Virginia's legislature has required that all school districts employ distinct RTL protocols to reintegrate children into the learning environment. While details of Virginia's RTL protocol are not published, school districts must develop and adhere to their own distinct protocols (Strauss, 2014).

Seventy-five percent of states, including Michigan, have adopted similar removal-from-play standards that require that any athlete suspected of suffering a TBI be removed from participation for at least that day, regardless of medical review or analysis (Figure 2). Of the remaining 25% of states, 16% require athlete removal only when observable symptoms have manifested, and are commonly identified by coaches and contest officials, 2% require removal only when an athlete experiences a loss of consciousness, 2% require only that removal guidelines are established, and 5% have no requirements at all (Tomei et al., 2012).

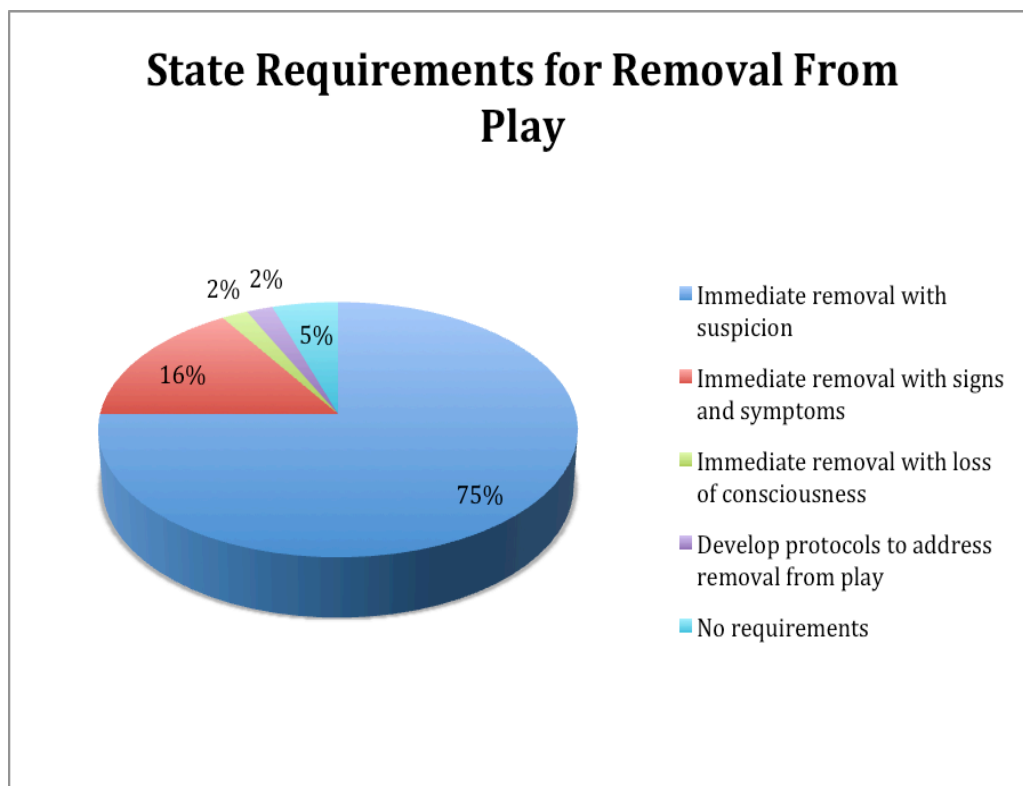


Figure 2. Percentage of States with Removal from Play Criteria (Tomei et al., 2012).

### Michigan's Legislation

In October 2012, Michigan Governor Rick Snyder approved Public Acts 342 and 343 (Michigan Department of Community Health, 2012), and ordered their execution on June 30, 2013. Public Act 342 identifies parameters that the state would enact to protect

the public health with regard to athletes and TBI, while Public Act 343 identifies what school districts and sport organizations would be required to do to ensure compliance. While Michigan was one of the last states to pass legislation on the matter, the MHSAA had been requiring member schools to adhere to concussion protocols for several years prior to many other states' legislative action.

Public Act 342 requires the state to develop an online concussion awareness training program that provides several key functions: [1] defines the nature and risks of concussions, [2] identifies the criteria for removal of an athlete from participation, and [3] defines the risks associated to athletes' non-reporting of symptoms and continued participation (Michigan Department of Community Health, 2012). While Public Act 342 allows any licensed health care professional whose scope of work relates to the management or treatment of TBI to determine further athletic participation, the MHSAA limits healthcare professionals to only those with the designation of MD, DO, RN or NP. This is a key difference between the legislation and MHSAA policy. Public Act 342 includes certified athletic trainers as healthcare professionals authorized to direct an athlete's return to competition, yet the MHSAA specifically prohibits certified athletic trainers from that function. Certified athletic trainers are often employees of local school districts and because of this a clear conflict of interest could exist.

Public Act 343 requires school districts and sport organizational bodies to adhere to several pre-participation mandates before allowing children to participate in athletic activity (Michigan Department of Community Health, 2012). Coaches, sport leaders, and physical education teachers must have participated in the online concussion education program before interacting with children involved with athletic activity. Educational materials must be presented to participants and parents or guardians of children before

participation is to begin. Educational materials (Appendix B) must include discussion concerning the identification of concussions, the risks associated with continued participation in athletic activity, and the severity of injury that is possible with TBI. A written and signed statement (Appendix C) by participants and parents or guardians must be obtained prior to participation that acknowledges receipt and understanding of pre-participation concussion awareness. Also, coaches and sport organizers are required to remove an athlete from participation who is suspected of sustaining a TBI until evaluated by an authorized medical professional.

### **Conclusion**

This study will examine the perceived effectiveness of Michigan's legislation on the behavior of reporting concussion events, the ways athletic administrators become aware of injuries, and the perceived barriers to injury reporting. From a review of current literature of educational and social/psychological theories, coupled with research of concussion protocols, reporting behavior, and legislative development, it is prudent to assess the effect concussion legislation in Michigan has on the reporting behavior of constituent groups.

### **Chapter Three: Methodology**

#### **Research Design**

Publically accessible records of concussion events do not exist in Michigan outside of individual medical records and due to the serious nature of TBI in school sports, examination of perceived adherence to mandated reporting legislation is warranted. To measure the impact of concussion legislation in the state, this study tapped the expertise of practicing school athletic administrators throughout the state. School athletic administrators possess a unique perception on this dynamic because of their constant interaction and connection with the educational athletic community and constituent groups in this study: athletes, coaches, officials, and parents.

Data for this study was collected in two forms: [1] a written survey (Appendix D), and [2] individual interviews (Appendix E). Written surveys were administered in spring and summer of 2016, beginning with administration of the survey, followed by ten individual interviews. Participation in the survey was voluntary, confidential, and guided by the University of Michigan - Flint Institutional Review Board approval. The 20-item written survey was presented through Qualtrics and accessed online.

Survey respondents were asked, via the survey, whether they would consent to an individual, 60-minute interview to further define the scope of survey responses to generate more qualitative data. Interview options for participants included telephone conversations, in person meetings, and electronic video-calling software (i.e. Skype, Face Time).

**Participants**

Participants in this study were generated from the population of practicing athletic administrators in the state of Michigan. By Michigan High School Athletic Association (MHSAA) rule, every school (public, private, and parochial) participating in competitive interscholastic sport under the auspices of the MHSAA must designate one person responsible for administration of that school's athletic program. From the database of more than six hundred registered athletic administrators, all were invited to participate in the study.

Participants from across the state representing both peninsulas, urban and rural, and from all socio-economic demographics completed the survey. Survey respondents were also asked to identify their primary function in interscholastic athletic administration (high school, middle school, or both). The education and experience of the participants was also considered.

**Instrumentation**

The survey instrument (Appendix D) was adapted from Register-Mihalik's (2010) work regarding the knowledge, attitudes, and behaviors concerning sport-related concussion. Content experts, athletes, and coaches throughout North Carolina have tested Register-Mihalik's survey for validity. Her survey was pilot-tested for reliability at several different high schools. The adapted survey for this study was designed to assess the perceptions of athletic administrators regarding the effectiveness of Michigan's concussion legislation in impacting behavior and protocol adherence among athletes, coaches, parents, and contest officials. This survey has been adapted to address the study's research questions. Survey items to address the research question related to barriers to reporting instances of concussion reporting have also been added to Register-

Mihalik's original model. The survey was developed in a manner that would allow for follow-up discussions in the individual interviews.

The first section of the survey included demographic identifiers including the primary level at which the athletic administrator is involved, whether it is at the middle or high school level. This section also identified whether or not the athletic administrator has had certification as an athletic trainer or other relevant medical professional. The final demographic identifier included the presence of certification through the National Interscholastic Athletic Administrators Association or an academic degree in athletic administration or a related field.

The second section of the survey included items related to the athletic administrator's perception of the effectiveness of Michigan's legislation as it relates to the behavior of athletes, contest officials, coaches, and parents using a Likert scale. The third section of the survey included items related to ways in which athletic administrators are made aware of TBI instances, and identifying those involved in the aftercare of the injured athlete. The fourth section included responses to true-false statements regarding the manner in which athletes, contest officials, coaches, and parents behave in relation to legislative standards. The final item in the survey provided an opportunity for participants to consent to individual interviews.

Individual interviews were designed to further probe survey respondents' perceptions. The interview included several open-ended questions related to the same topics as appearing in the survey (see Appendix E). Interview participants were asked to clarify and expand on their individual survey responses by providing examples and commentary from their perspective. Interview sessions were designed to be informal and conversational yet guided by the researcher to address the same areas of focus as the



survey sections regarding the perceived behavior of athletes, parents, coaches, and officials, as well as the participant's assessment of the effectiveness of concussion legislation.

Thirty-three athletic administrators surveyed indicated their willingness to participate in interviews. Each of the willing participants was individually numbered and ten interview subjects were selected using a random number generator. For transcription purposes, in-person interviewees were asked to consent to allow audio recordings of the interviews and telephone and web-connected interviewees were asked to consent to allow an audio recording device to be used near the researcher's telephone or computer.

### **Research Procedures and Pilot Testing**

The survey used in this study was an adaptation of that tested by Register-Mihalik (2010). In testing the validity of content and construct prior to employing the instrument in the field, members of both the Illinois and Indiana state athletic administrators' association assisted with the development and administration of a pilot of the survey. Feedback was collected from athletic administrators in Illinois and Indiana, coupled with analysis by a University of Michigan-Flint faculty member to identify areas of concern needing correction before the final survey was to be administered in Michigan.

The survey instrument was distributed to all registered athletic administrators in the database of the MIAAA via email. The survey was open for 30 days with a subsequent email sent after two weeks inviting additional respondents.

Survey respondents indicated their willingness to participate in an interview through a single item in the survey, asking for contact information to initiate interviews. Of the thirty-three respondents willing to participate in an interview, each was assigned a

number from 1-33. Using an online random number generator, ten interview subjects were selected.

### **Analytic Method**

The researcher was the sole individual responsible for data collection, analysis, and storage. For survey data, results were quantified in the Likert-scale and true-false response items in terms of frequency and percentage of responses. Each table included in chapter four includes findings presented in both frequency and percentage data where appropriate. Chapter Five contains discussion of the similarities and differences between survey data throughout the various constituent groups.

The canons of grounded theory (Corbin & Strauss, 1990) guide the analysis of interview data in this study. The scientific canons of compatibility, generalizability, consistency, and reproducibility were utilized to code and classify interview data. During the recorded interviews, the researcher compiled field notes, which were compared to the audio recordings to create a matrix of interview subject responses where each individual's responses to interview questions were catalogued according to the specific research question addressed. The researcher then separated interview subject responses according to the specific constituent group addressed in the responses. This analysis of data across the different groups and within each group allowed for the discovery of themes among the responses to provide further explanation and insight in to the questions asked in this study.

Interview data using contextual identifiers was coded as positive, negative, or neutral in several instances regarding the perceived impact of legislative influence on concussion reporting behavior. Positive responses were recorded when interview

subjects' commentary indicated a perceived behavioral change in the constituent group that is consistent with legislative requirements. A negative response was recorded when commentary indicated a behavioral change since passage of legislation that was not consistent with legislative requirements. Neutral responses were recorded when interview subjects indicated no real behavioral change in a particular constituent group.

The canons of reproducibility and consistency allowed for concepts repeated by multiple interview subjects to be identified and measured, which the survey instrument alone could not provide. Chapter Four discusses several themes identified in the interviews and identifies several themes that emerged following the analysis of the interviews. These emerging themes include the frequency of terms like, "old-school", "awareness", and interview subjects' experiences with different constituent groups and their perceived behavior in relation to concussion legislation.

### **Summary**

Sport concussions are not a new phenomenon, but the attention about sport concussion, and legal ramifications concerning identification, management, and procedural safeguards are new phenomena. While sports are arguably safer today than they have ever been with new playing rules, safer equipment, and increased education and awareness, increased attention to the subject makes a compelling case that competitive contact sports are not safe and that mistreatment of sport concussions can lead to life-damaging complications, litigation, and abandonment of amateur sport participation.

In a relatively short span of time, new legislation related to TBI has been enacted across America, yet there are still components of legislation yet to be resolved in Michigan. It has yet to be determined the extent to which concussion laws in Michigan

have impacted behavior in reporting concussion events. The effectiveness of the law has yet to be measured. The state of Michigan has yet to create, authorize, direct, or establish a central repository for collection of important data regarding amateur sport concussion events for analysis and archival purposes. The MHSAA has begun the initial process of collecting such data for reporting purposes. As a first step, this work seeks to measure the perceived impact of Michigan's concussion legislation as it relates to constituent groups involved in interscholastic athletics.

## **Chapter Four: Findings**

The problem facing measurement of the effectiveness of Michigan's concussion legislation is that limited data exist to determine the effect that the state's laws have on the reporting of TBI among athletes in Michigan. The purpose of this study is to analyze data from the perception of the state's athletic administrators to measure the effectiveness of the legislation. Data was gathered from a survey and individual interviews with practicing athletic administrators currently in the field.

This chapter will identify the demographic details of the athletic administrators who participated in the study according to their primary level of school administration, educational level, and presence of any pertinent medical training. Data from the survey as well as responses from the open-ended interview items are also presented in this chapter.

### **Demographic Detail of Participants**

A total of 640 athletic administrators were invited, via email, through the MIAAA registration database. Eighteen members listed in the database were retired from the association and were removed from potential participation in the study. Of the remaining 622 registered members, 212 responded to the survey invitation. Ten of the 212 respondents opted not to participate in the survey leaving a total of 202 survey respondents for a response rate of 32.5%.

The athletic administrators who participated in this study are categorized according to several demographic criteria (see Table 2). The first criterion is the general level in which they administer a school's athletic program (i.e., high school or middle school). The second criterion is the participant's advanced educational preparation in

terms of athletic administration. It should be noted that Michigan does not require athletic administrators to have advanced training in educational leadership, coaching, or sports management. The third criterion includes any specialized medical training, including sports medicine.

Table 2

*Demographic Detail of Survey Respondents*

Level of Administration		Advanced Education		Medical Training	
High School %	Middle School %	Yes %	No %	Yes %	No %
96.4	3.6	68.0	32.0	13.2	86.8

N=197. Five respondents did not respond to demographic identifying survey items.

**Categorization of survey participants.** Survey participants were categorized based on their general level of athletic administration, possession of advanced education in athletic administration, and certification through advanced medical training. Survey participants who have general responsibilities for high school programs totaled 96.4% (n=197) compared to nearly four percent of participants who exclusively administer middle school athletic programs. This classification is important to this study since middle school athletic programs often do not include the sports of football, soccer, and ice hockey which are often classified as collision sports and are present in high school programs.

Sixty-eight percent of survey respondents indicated that they classified themselves as having advanced education in athletic administration, compared to 32% who did not. Athletic administrators are considered to have obtained advanced education in athletic administration by earning an academic degree in athletic administration or a similar field or for achieving certification through the National Interscholastic Athletic Administrators Association’s (NIAAA) Leadership Training Institute (LTI). Courses

within the NIAAA's certification program contain elements of TBI symptom identification, basic sports medicine, and the legal duties of coaching. The survey identified either the attainment of an academic degree in athletic administration or NIAAA certification as holding advanced education.

Of the survey respondents, 13.2% identified themselves as having specialized medical training. Respondents with specialized medical training were asked to indicate which forms of medical training they possessed with an open-ended survey response item. Table 3 identifies the forms of specialized medical training identified by the twenty six survey respondents.

Table 3

*Forms of Advanced Medical Training of Athletic Administrators*

Form of Training	%
First Aid / CPR / AED	5.6
Certified Athletic Trainer	3.6
Heads-Up Concussion Course	1.0
National Federation of High Schools Certification	1.0
MHSAA Coaching Certification	0.5
Paramedic Certification	0.5
Rescuer Certification	0.5

N=197. Athletic administrators who participated in the survey.

The most common form of advanced medical training identified by survey respondents is first aid/CPR and Automated External Defibrillator (AED) training with 5.6% of athletic administrators identifying themselves as certified. The most common exhibition of specialized medical training relevant to TBI included certification as an

athletic trainer, of which 3.6% of the respondents indicated having certification, including one respondent who indicate that s/he was certified as a rescuer.

### **Reporting Behavior of Constituent Groups**

**Survey findings.** Athletic administrators participating in the survey were asked to evaluate the impact Michigan's concussion legislation has had on the reporting of concussion events since its adoption in 2013 among four constituent groups: athletes, contest officials, coaches, and parents. Table 4 outlines the perception that athletic administrators have of concussion event reporting behavior of each constituent group prior to and since the adoption of the state's legislation. The athletic administrators' responses were categorized as either providing a positive, neutral, or negative impact on the reporting of concussion events.

Positive responses indicate that the athletic administrator either selected a response of either strongly agree or agree to the relevant survey item. This indicates that the athletic administrator perceives that Michigan's legislation has had a positive impact on the reporting behavior of concussion events by the specified constituent group. Conversely, a negative response includes athletic administrators that either disagreed or strongly disagreed with the relevant survey item, indicating that the participants selecting these perceived that Michigan's legislation has had a negative impact on reporting behavior. A neutral response indicates that the athletic administrator believes there has been no noticeable change or is unsure of any change in the reporting behavior of the constituent group since the adoption of Michigan's concussion legislation.



Table 4

*Athletic Administrator Perception of Legislative Impact on Constituent Group Reporting Behavior*

Constituent Group	Legislative Impact on Reporting Behavior		
	Positive	Neutral	Negative
Coaches	172 (87.3%)	16 (8.1%)	4 (2%)
Parents	160 (81.2%)	28 (14.2%)	4 (2%)
Athletes	148 (75.1%)	31 (15.7%)	15 (7.6%)
Officials	130 (66%)	51 (25.9%)	10 (5.1%)

N=197.

Athletic administrators indicated that Michigan's concussion legislation had a positive impact on the reporting behavior of all four constituent groups and the largest positive impact on the reporting behavior of coaches with 87.3%. Legislation is perceived to have the largest negative impact on the athletes with 7.6%. The legislation had the largest neutral response of 25.9% among officials, indicating that athletic administrators perceive that the reporting behavior of concussion events of contest officials has had neither an affirmative nor a negative impact to a greater degree than any other group. In each of the four constituent groups, the frequency of perceived negative legislative impact on reporting behavior was much less than the perceived positive impact.

**Interview findings.** Thirty-six survey respondents voluntarily agreed to be contacted for one of ten randomly selected interviews to expand upon survey topics while providing examples from their own professional practice in the field. Interviews were approximately thirty minutes in length and conducted through telephone conversations or through electronic video via Face Time or Skype. Ninety percent of the interview

subjects commented that Michigan's concussion legislation has impacted awareness of not only symptoms of potential TBI but also treatment protocols in place to assist injured athletes. One subject commented, "People are constantly talking about it [concussions]. Kids are more aware of them." Another stated that the legislation has, "Helped to expand the ability for coaches and the AD [athletic administrator] to identify and help injured athletes." Some subjects spoke of specific constituent groups, and their increased awareness of TBI due to the state's legislation. One interview subject reported, "Officials are a bit more active in helping out with injuries." Another stated, "The days of getting your bell rung are over. Parents have become more aware."

Table 5 identifies the aggregate results of the interview subjects' commentary regarding the reporting behavior of TBI among the four constituent groups in this study. Interview commentary was coded as positive when the interview subjects indicated that their experience has led them to perceive that legislation has had the desired effect of increased concussion event reporting by constituent groups. Commentary was coded as negative when interview subjects indicated that legislation has led to a decreased effect in concussion event reporting. Transcripts from the ten interviews were coded when subjects spoke of any of the four constituent groups in their commentary. Coded data was then categorized as either positive or negative according to their perception. One interview subject identified both positive and negative examples regarding coaches reporting behavior as a result of Michigan's legislation. Both the positive and negative responses were coded and reported in the data. Several of the ten interview subjects either had no commentary about the reporting behavior of one or more constituent groups or were unsure of the impact that the legislation has had.

Coaches at 70% were most commonly identified as the group that has experienced the most positive impact of effective reporting behavior since the adoption of Michigan's legislation. One interview subject commented, "Coaches in our school are proactive and I have seen other schools brought back to the pack where we were. We have been concussion testing for years."

One athletic administrator indicated a negative response regarding the impact that legislation has had on reporting behavior of coaches, saying, "There are still some old-school people out there that are used to old practices." The subject's comments continued to indicate that some coaches might still discourage the reporting of symptoms that may not appear to be severe. The same subject further added that some coaches, "...may still question removal during a contest without evaluation, but it's hard to ignore anymore."

Table 5

*Impact of Legislation on Reporting Behavior of Constituent Groups*

Constituent Group	Positive	%	Negative	%
Coaches	7	70	1	10
Officials	6	60	4	40
Athletes	5	50	3	30
Parents	2	20	7	70

N=10. Athletic administrators participating in individual interviews.

The parent constituent group received the fewest indications of a positive impact and the highest indications of a negative impact of legislation on reporting behavior with two and seven respectively. One subject detailed a situation involving a girls' basketball player who had been progressing through the 5-step RTP protocol. One day on the third

step of the protocol, the athlete complained of having a headache, which prompted the school's athletic trainer to return her appropriately to the first step of the progression. The parent called the athletic administrator upset. As their conversation continued, the administrator made the comment, "Are you telling me I am being too cautious with your daughter's brain?" Another subject indicated that, "Parents grumble, usually for insurance purposes that this is going to cost me another copay". A third subject indicated that she has experienced two different occasions where parents attempted to over-rule a doctor's removal from participation decision to allow their child to compete; and a fourth subject indicated that he believes there are, "Still some old-school parents out there that believe their son just had his bell rung and shouldn't tell the coaches."

Two interview subjects revealed conflicting opinions regarding the impact of legislation on the reporting behavior of athletes. One subject indicated that, "Kids are hiding injuries because they know they won't play." Another subject commented that athletes were, "...protected, and a little more likely to report [injuries]." Another pair of subjects providing conflicting opinions with one stating that, "...kids are not reporting injuries because they don't want to sit out"; while another commenting that, "Kids have even reported injuries that have happened outside of school activities."

### **Awareness of Concussion Events**

**Survey findings.** Table 6 indicates the various methods that athletic administrators (N=197) indicate they become aware of concussion events. In the survey, respondents may have selected multiple methods for reporting TBI, that is one participating respondent may have indicated that he becomes aware of injuries in several ways including personal observation, physicians' documentation, and coach reports. In these instances, the respondent's responses were recorded in all three categories. It is

also possible that the same potential injury can be categorized in multiple categories. For example, an injury may be observed by the athletic administrator and also reported through an MHSAA official's report. In these instances, the responses were included in both categories. Personal observation of TBI was the most common method of awareness at 79.7%. Other methods most commonly reported include personal contact from coaches and/or parents (75.1%), physicians' documentation (68.5%), MHSAA officials' reports (60.9%), emergency medical technician (EMT) contacts (41.6%), and other (26.9%).

Table 6

*Methods of Reporting Instances of TBI to Athletic Administrators*

Method of Report	Number of Instances	%
Personal Observation	157	79.7
Personal Contact	148	75.1
Physician's Documentation	135	68.5
MHSAA Official's Report	120	60.9
EMT Contact	82	41.6
Other	53	26.9

N=197. Athletic administrators who participated in the survey.

Athletic administrators were also asked to indicate which individuals are most commonly involved in the aftercare of athletes who have suffered TBI. Table 7 identifies the individuals who are often involved in injured athletes' aftercare. Parents (86.8%) and assistant principals, attendance officers, and neuropsychologists (.5% each) provide the most and least commonly reported individuals involved in an injured athlete's aftercare.

Teachers (30%) represent the median group. Individuals involved in the aftercare of injured athletes will be compared to the median group of teachers in Chapter Five.

Table 7

*Athletic Administrator Perception of Individuals Involved in Aftercare of Athletes Suffering TBI*

Involved Individual	Number of Instances	%
Parent	171	86.8
Coach	164	83.3
Physician	161	81.7
Athlete	156	79.2
Athletic Trainer	156	79.2
Athletic Administrator	142	72.1
Teacher	59	30
Guidance Counselor	44	22.3
Principal	36	18.3
School Nurse	17	8.6
Assistant Principal	1	.5
Attendance Officer	1	.5
Neuropsychologist	1	.5

N=197. Athletic administrators who participated in the survey.

**Interview findings.** Table 8 indicates the number of instances that the ten interview subjects identified sources of injury reports. A response was recorded each time a source of reports was mentioned throughout the interviews. Athletic trainers and medical personnel were mentioned twelve times in the ten interviews and were the most consistently mentioned group with multiple comments by several interview subjects.

One subject indicated that his recommendation to school district officials is to cut any item in the athletic department’s budget before cutting the services of the athletic trainer. The same subject also stated that he “would rather be too cautious 99% of the time than be wrong 1% of the time.” Another subject reported that he meets with his athletic trainer at 2:00 PM daily for a report on athletic injuries and RTP protocol progressions. Two other subjects both indicated that they have experienced classroom teachers referring athletes to their school’s athletic trainer for evaluation after observing TBI symptoms in their classrooms.

Table 8

*Sources of Reports to Athletic Administrator of Instances of TBI*

Source of Report	Number of Instances Mentioned
Coaches	8
Officials	0
Athletes	2
Parents	5
Athletic Trainer / Medical Personnel	12

N=10. Athletic administrators who participated in individual interviews.

Eight of ten interview subjects indicated that coaches frequently make reports of athletes potentially suffering TBI. Those reports come in the form of formal written reports, phone calls, and text messages to the athletic administrator. One subject indicated that some athletes and parents do not report injuries initially stating that “Some kids don’t report symptoms at practice or a game, their parents take them to the doctor, and I get calls or notes from the family.”

### **Traditional Barriers to Concussion Event Reporting**

**Survey findings.** Respondents were asked to respond to several survey items related to traditional barriers to concussion event reporting through a series of true/false responses to individual statements. Table 9 details the degree to which athletic administrators believe selected statements to be true. Respondents agreed unanimously that the coaches at their schools were, "...knowledgeable about recognizing concussion symptoms." The statement, "Students and their families take concussion events seriously" earned an affirmative response rate of 96.8%. When athletic administrators responded to survey statements regarding RTP and RTL protocols, there was more variance in their responses. The RTP-related statement, "School personnel are deliberate about following steps to return an athlete to full participation" received an affirmative response of true by 99% of athletic administrators while the RTL-related statement, "School personnel are deliberate about academic accommodations to reintegrate an injured athlete back into the classroom" received an affirmative response of 81.1%.

The traditionally dismissive phrase, "He just got his bell rung" was used in two survey items to compare the mindset of parents and coaches of athletes according to the perception of athletic administrators. An affirmative response of 75.7% was calculated to describe coaches compared to a rate of 50.3% of parents that no longer use phrases or comments that are traditionally dismissive of TBI.



Table 9

*Athletic Administrator Survey Responses to True/False Statements Regarding Traditional Barriers to Concussion Event Reporting*

Statement on Barriers	True	False
The coaching staff at my school is knowledgeable about recognizing concussion symptoms.	190 (100%)	0 (0%)
School personnel are deliberate about following steps to return an athlete to full participation.	188 (99%)	2 (1.1%)
Students and their families take concussion events seriously.	184 (96.8%)	6 (3.2%)
School personnel are deliberate about academic accommodations to reintegrate an injured athlete back into the classroom.	154 (81.1%)	36 (19%)
Comments related to concussions like, "He just got his bell rung", are no longer mentioned by <i>coaches</i> at my school.	143 (75.7%)	46 (24.3%)
Comments related to concussions like, "He just got his bell rung", are no longer mentioned by <i>parents</i> at my school.	95 (50.3%)	94 (49.7%)

---

N=190. Athletic administrators who participated in the survey.

**Interview findings.** Several sample statements were provided to interview subjects to indicate the nature of dismissive sentiments that have traditionally been barriers to effective injury reporting. Among them are: "he just got his bell rung," "she has a big game coming up and can't miss it." and, "if he misses game time, he'll miss out on a scholarship." Subjects were asked to describe the degree to which Michigan's concussion legislation has impacted those types of statements in their experience. Three of the ten interview subjects indicated a sense of legal liability and moral responsibility for adherence to the legislation. Three subjects also used the term, "old-school" to

describe parents and coaches that may still be hesitant to report injuries since the adoption of the state's legislation due to traditional barriers.

Seven subjects indicated that increased awareness of TBI and RTP/RTL protocols have challenged traditional beliefs and practices. One subject stated that the, "law has put us in a good direction," and that, "we are never perfect. Compared to five, ten, twenty years ago, we have come a really long way." Another subject referred to national attention through lawsuits filed against the NFL indicating, "Big-name athletes and lawsuits have heightened awareness." Another subject added that people, "Still use terms like "bell-ringer" to identify an injury, not to elude it."

Conversely, five interview subjects described concerns that still remain regarding traditional barriers to concussion event reporting. One subject remarked that the "pendulum has swung too far. Perhaps we are overly cautious. Parents are being scared off." The same subject, referring to social media and instant-news making parents fearful of sports participation stated, "A kid dies in New Jersey on Friday, and I hear about it Saturday. [Playing sports] is safer than driving a car; there is inherent risk in everything."

One interview subject made a distinction between high school sports, which are governed by the MHSAA and operated through schools' athletic administrators, and non-school amateur athletic competition in the Amateur Athletic Union (AAU). This subject described his interaction with his school's girls' basketball coach who also coaches a team in the AAU as differing in adherence to Michigan's concussion laws. The subject stated that, "There is not a ton of oversight in AAU. They sign the forms, but that is about it. They don't have trainer coverage, and coaches may sit a kid for a few minutes."

The same subject added that, "My coach says AAU attention is significantly less. They do a poorer job than the MHSAA."

Data from the survey and interviews can provide insight into the effectiveness of Michigan's concussion legislation. Results of this study will be analyzed and discussed in Chapter Five.

## **Chapter Five: Interpretations**

This chapter will provide a discussion of the results of the study examined in Chapter Four. The purpose of this study is to analyze the perception of the state's athletic administrators' perceptions of the effectiveness of concussion reporting legislation. Data was gathered from a survey and individual interviews with practicing athletic administrators currently in the field. Data from the survey and interviews will be discussed to answer the three research questions regarding reporting behavior, concussion event awareness and traditional barriers to concussion reporting. Finally, this chapter will suggest the implications of this study and make recommendations for future research.

### **Reporting Behavior of Constituent Groups**

**Athletes.** Athletes were the constituent group in the survey identified as having the largest negative impact from legislation with 7.6%. A negative impact is determined by responses of either disagree or strongly disagree to relevant survey items. This negative impact is reinforced by the theory of planned behavior (TPB) described in Chapter Two. Ajzen's (1985) theory describes the likelihood of performing a specific behavior by adding the strength of one's attitude toward the behavior to the strength of the social norms associated with the behavior, then dividing that sum by the ability of the subject to perform the behavior. The perception of athletic administrators that athletes are the most negatively impacted of the four constituent groups may most likely be explained through the TPB. An athlete may choose not to report symptoms of TBI because either the social norm associated with symptom reporting or the strength of his attitude about reporting symptoms are outweighed by traditional barriers to reporting

injuries, including a loss of playing time or a potential loss of a collegiate athletic scholarship. Register-Mihalik's (2010) work identifies athletes' under-reporting of TBI as high as 49%, while Wallace's (2015) work on athletes in Michigan places the rate of under-reporting at 55%. The studies by both Register-Mihalik and Wallace cite these same traditional barriers as key factors in under-reporting and are consistent with the findings in this study.

Social identity theory may also explain why the athlete constituent group experienced the highest negative response to TBI symptom reporting. As Tajfel (1974) describes social identity theory, an individual's self-esteem may be impacted according to his status as a member of the "in-group" or the "out-group." An athlete may be hesitant to report symptoms of TBI out of fear that his status as an accepted member of the team may be jeopardized due to non-participation, or that he may appear to other team members to be weaker or less worthy of high status on his team.

**Coaches.** The coaches' constituent group is perceived by athletic administrators as having the most positive impact from the legislation regarding reporting behavior at 87.3% in the survey and at 70% in the interview data. A positive impact is determined as a response of either strongly agree or agree to relevant survey items, while a positive impact in the interview is determined by coding participant comments as either positive or negative. This data, coupled with the interview subjects' discussion of the fear of litigation or loss of employment as factors in legislative compliance, reinforces the notion that coaches are the most positively impacted of the four constituent groups.

Both Ajzen's (1985) theory of planned behavior and Tajfel's (1974) social identity theory may shed light on this. According to the theory of planned behavior, the social norms associated with the intended behavior of coaches reporting injuries may

prevail over other attitudes and norms associated with failure to report injuries. Social identity theory arguably places coaches who faithfully adhere to the state's legislation as being members of the "in-group." Failure of a coach to report TBI symptoms or endorse any of the traditional barriers associated with dismissing injuries or symptoms most likely would demote the coach to a member of the "out-group." It can also be argued that designation as a member of the in-group or out-group is fluid and fluctuates over time. Geography and history may be contributing factors in determining behavior that places individuals in the in-group or out-group. The social norms of remote-rural or urban areas may place a higher premium on the apparent fortitude or toughness of an individual, thus the in-group behavior may be to conceal injuries since reporting TBI may be considered a sign of weakness to others in the group. Additionally, the traditional barriers examined in this study are historical attitudes that arguably lead to the current rates of under-reporting of injuries. It can also be argued that the intent of the state's legislation is to advance the notion that reporting concussion events is a behavior that is accepted by members of the in-group.

**Officials.** Data suggests that further efforts aimed at increasing the effectiveness of legislation for officials are warranted according to the perception of athletic administrators. Compared to the other constituent groups, athletic administrators report that the reporting behavior of officials has not increased as much as the other groups since the legislation was adopted. Furthermore, athletic administrators perceive that among the four constituent groups, officials have the highest rate of no behavioral change at all. This data, coupled with interview data that were nearly split between positive (6) and negative (4) impacts, indicates a lack of legislative effectiveness compared to the other constituent groups. The lack of clarity of the role of officials in the legislation may

explain why athletic administrators' perception of the effectiveness of the legislation is higher among the other three constituent groups. The legislation does not refer to officials explicitly, only as, "...other adults who are involved with the participation of youth athletes in athletic activity..." which explains the lack of positive impact (see Appendix F).

Officials may have little or no personal interest that prevents them from reporting TBI or symptoms. It may be of little or no consequence to officials who participates, who wins, or who is in the in-group or out-group. Therefore, it should be expected that officials have a lower rate of ambivalence in the perception of athletic administrators, yet they are presumably more neutral. The lack of athletic administrators' perceived clarity of the roles and responsibilities of officials might explain their view that legislation has had limited effectiveness on their reporting behavior.

**Parents.** Comparing survey and interview data regarding perceived parent reporting behavior reveal the data that appear to be contradictory. In the survey, parents had the lowest rate of a negative legislative impact with 2% and the second highest positive impact with 81.2%, meaning that survey respondents generally agree that the legislation has had a positive impact on increased reporting behavior. This is in contrast to the interview data, where parents had the highest rate of negative impact with 70% and the lowest positive rate with 20%.

### **Awareness of Concussion Events**

Athletic administrators were presented six possible reporting types in the written survey. The options included: Emergency Medical Team (EMT) contact, MHSAA official's report, personal contact (from coach, athlete, or family member), personal observation, physician's documentation, and other. Among the respondents that selected

an option of other, those who identified reports made from coaches or athletic trainers were included in the personal contact category. Respondents were allowed to select multiple reporting types from the list provided and were also allowed to submit multiple entries when the option of "other" was selected. Athletic administrators reported similar findings between four of the categories of reporting types (MHSAA official's report, personal contact, personal observation, and physician's documentation) between 60-80%. EMT contact was the most infrequently utilized method of injury awareness with 41.6% of athletic administrators reporting that they have become aware of injuries this way.

In the ten interviews, twelve specific instances of reports from athletic trainers or EMT personnel to the athletic administrator were recorded, compared to eight instances of administrators identifying coaches as the main source of TBI reports, followed by parents with five, athletes with two, and officials with zero. The data presented from the survey and interviews appears contradictory in regard to officials. 60.9% of survey respondents identified officials' reports as one of the methods of becoming aware of injuries. Contrary to the survey, no interview participants identified officials as a source of reports. This can best be explained by the format in which the data were collected in the two instruments. In the survey, athletic administrators selected officials as a source of reports from an included list of sources. The survey did not examine the degree of each of the listed sources. An athletic administrator may have selected officials as a source of TBI reports, though it is possible that officials' reports may have only occurred minimally over time. In contrast, interview participants may have overlooked officials and commented on the more common sources of injury reports, which most often came from athletic trainers and coaches through personal contact.



Data derived from the survey regarding individuals involved in the aftercare of injured athletes provides valuable insight and justification for increased clarity from both sport governing bodies and the legislature for an increased focus on academic support for students and enhanced attention to RTL protocol. Of the individuals identified in the survey as being involved in the aftercare of injured students, a distinctive pattern emerged. Individuals involved in the aftercare of injured students included principals, guidance counselors, and teachers all of whom can be considered academic or non-athletic staff. Other individuals included coaches, athletic trainers, and athletic administrators; often classified as athletic department personnel. The remaining individuals identified include non-school or medical staff such as parents, students, physicians, and nurses. In the distribution of individuals involved in the aftercare of injured athletes, teachers represent the median response with 59 survey responses, a rate of 30%. As many individuals in the distribution were ranked above teachers as were ranked below.

All individuals classified as athletic personnel, ranked above the median, while all individuals classified as academic personnel ranked below the median, with the exception of teachers, which were at the median. Individuals classified as non-school or medical personnel were divided with parents, physicians, and students above the median, and neuropsychologists and school nurses below it. This set of data underscores the fact that athletic administrators commonly agree that athletic personnel are more commonly involved in the aftercare of children suffering TBI than their academic counterparts. Arguably, academic progress and classroom interventions are more beneficial to the development of children, yet the data suggest that more intervention and attention are provided to initiate RTP protocol, rather than RTL protocol.

**Traditional Barriers to Concussion Event Reporting**

Survey responses related to RTP and RTL protocols yielded an apparent gap in the academic and athletic realms for the student-athletes. The RTP related survey item, “School personnel are deliberate about following steps to return an athlete to full participation” had an affirmative response rate of 99%. The near-identical RTL related statement: “School personnel are deliberate about academic accommodations to reintegrate an injured athlete back into the classroom” had an affirmative response rate of only 81.1%. While both, arguably, have a high affirmative response rate, the gap between the two responses indicate a possible gap between RTP and RTL protocol implementation. Furthermore, this finding indicates that according to athletic administrators, TBI may be considered more of an athletic concern, and school personnel may be overlooking the academic difficulties associated with the injury.

Another barrier in concussion event reporting is the use of traditionally dismissive terms like “she just got her bell rung,” or “it’s just a stinger.” The survey included items related to these dismissive terms. The finding that athletic administrators perceive that 75.7% of their coaches no longer use these dismissive terms compared to parents at 50.3% indicates that athletic administrators may believe there is a deficiency in the effectiveness of the legislative impact on parents. This data is indicative of the need for stronger legislative requirements and increased attention by sport governing bodies to educate and inform parents of the risks associated with TBI to a higher degree. Furthermore, the finding that athletic administrators perceive that only 50.3% of parents no longer use traditionally dismissive terms contradicts another data point from the survey. Athletic administrators agreed with the statement, “Students and their families take concussion events seriously” at a rate of 96.8%. These two data points appear

contradictory and in need of further evaluation when nearly all of the athletic administrators surveyed perceive that their students and families take concussion events seriously, when they also perceive that almost half of the parents still use dismissive terms related to TBI.

Several other data points suggest that the parent constituent group demonstrates the existence of barriers to a greater degree than the other three groups. Findings in the interview identify parents as the largest barrier to effective concussion reporting. The term “old-school” being referred to in three out of the ten interviews to describe a reluctance to report concussion events, coupled with data from Register-Mihalik (2010) and Wallace (2015), demonstrates the continued existence of traditional barriers to concussion event reporting.

### **Implications of the Study**

This study can serve as both an initial report of the effectiveness of PA 342 and PA 343 to the legislators of the state of Michigan as well as a tool providing guidance to sport-governing bodies such as the MHSAA suggesting areas where further attention and focus of legislative expectation are warranted. Each of the four constituent groups in this study can glean some feedback regarding their collective role in the process of effective reporting of TBI.

This study suggests that athletes may experience a higher rate of effective concussion event reporting with further educational platforms backed by research presented in this study. By coupling the principles of the theory of planned behavior (Ajzen, 1985) with the social identity theory (Tajfel, 1974), athletes may find more comfort in reporting symptoms and injuries without fear that their exclusion from athletic participation will compromise their status as members of the in-group. Through the

evolution of the social norms in Michigan and America, the formula presented in the theory of planned behavior can be altered, increasing the likelihood of the intended behavior; an increase of TBI reports may be realized. By combining the tenets of both the social identity theory and the theory of planned behavior, as the mentality of the “in-group” includes the notion that concussion symptoms and injuries should be reported, the value of the social norm increases, meaning the intended behavior of reporting concussion events increases.

Ajzen's theory of planned behavior calculates the behavior intention (BI) as the sum of the weighted ( $w_1$ ) behavioral attitude (AB) and the weighted ( $w_2$ ) social norms (SN) divided by the perceived behavioral control (PBC), or means by which to perform the intended behavior. The formula is displayed as  $[w_1(AB) + w_2(SN)] / PBC = BI$ . When the value of the social norm is impacted by the legislation to the degree that reporting concussion events is the behavior associated with the social identity theory's placement of individuals within the in-group, and individuals have the means to report injuries, then the behavior intention increases and the rate of under-reporting decreases.

Coaches may find comfort in the findings of this study. In nearly every quantifiable measure in this study, athletic administrators have expressed their belief in the effectiveness of coaches in reporting TBI and in adhering to RTP protocol. Coaches should also realize a call to action based on the findings of this study. Several findings in this study suggest that the “old-school” mentality of coaches still exists and that the importance of winning athletic contests may still compromise the behavior of coaches in protecting and promoting a safe environment for their athletes.

This study has found that some ambiguity exists regarding the role of contest officials. Data suggests that athletic administrators may not see a clearly defined role for

officials in the legislative expectations and procedural expectations of effective concussion event management. The perception of athletic administrators regarding the effectiveness of concussion legislation is that contest officials trail the other constituent groups in both quantifiable and qualitative measures.

It is understandable that parents have a more personal connection to the safety of athletes than the coach or official constituent groups. The body of research, coupled with the results of this study, both quantitatively and qualitatively, strongly indicate that the athletic administrators' perceived reporting of the behavior of parents at times jeopardizes the effectiveness of Michigan's concussion legislation. While all constituent groups would benefit from increased efforts toward effective concussion event reporting, no group would benefit more from these efforts than the parents of athletes.

### **Limitations of the Study**

Though participation in this study was voluntary among the population of members of the MHSAA, there is a risk that particular demographics of participants may be under-represented in the sample. For example, it is possible that low rates of participation among rural athletic administrators occurred.

A second limitation is the notion that participating athletic administrators' perceptions may be impacted by the knowledge that the existence of concussion legislation should change behavior, and therefore their opinions may reflect the expected behavior, rather than actual behavior.

This study is further limited due to the participants' comfort self-reporting behaviors that may be less than expected according to the legislation. An athletic administrator participating in an interview may have been hesitant to share behaviors in the presence of a colleague that portrays an unfavorable, or even illegal practice in their

own athletic program or community. An interview participant may have also avoided describing relevant experiences due fear of a tarnished reputation to himself, their school district, or their community.

### **Future Research**

This study provides an initial investigation into the perceived effectiveness of Michigan's concussion legislation. Continued study in this area can provide further insight for residents of Michigan and beyond. Future research should continue to replicate this study to further strengthen the findings. Each of the four constituent groups should be studied in the future, and the results of those studies should be compared to this baseline data regarding the effectiveness of Michigan's legislation.

The research model in this study utilized two data collection methods including an electronic survey and individual interviews. These same data collection methods, used in future research should be used to examine data from all constituent groups. In this study, the research model was used to measure the perception of athletic administrators. The same model can and should be applied to the athlete, coach, official, and parent constituent groups. Data from these further examinations can then be compared against one another both quantitatively and qualitatively. The perception of these other key constituent groups can be used in concert with this work to garner more information and valuable insight into the topic of TBI and legislative effectiveness.

The findings of this study should be measured against studies of the other constituent groups to determine a holistic interpretation of legislative effectiveness. For example, this study found that the role of contest officials is unclear and their operational obligations are sporadically applied, according to the perception of athletic

administrators. Future work focusing on the perception of contest officials, among other groups, may provide further insight and either confirm or refute the findings of this work.

Findings from this study reveal additional needs for further research. Survey responses indicate that a gap exists between the impact Michigan's legislation has in returning an injured athlete to competition and returning an injured student into the classroom learning environment. Additional study is required to examine why this gap exists. It is perceived that families take concussion events seriously, yet nearly half of the state's athletic administrators perceive that parents still use dismissive terminology to minimize TBI instances. Future research should be conducted to evaluate whether or not parents' beliefs regarding TBI are altered when their own child is impacted by the injury.

Future work should also include consideration of all four constituent groups toward the perceived effectiveness in implementing legislative mandates of the athletic administrators in their local school districts. Assessing the athletic administrators' effectiveness in legislative protocol may contain valuable data that when measured against the findings of this study, will provide a more vivid depiction of the current status of legislative effectiveness.

Future research should also examine the perceived effectiveness in non-school sports programs. One interview participant suggested that a basketball coach for the school program also coaches basketball in the Amateur Athletic Union (AAU) program. His commentary suggested that the perceived effectiveness of concussion legislation in the non-school amateur programs may vary from the perceived effectiveness in school-sponsored programs.

For future comparisons to this work, it is recommended that application of the survey instrument be adapted to the nuances of the specific constituent groups. For

example, a survey administered to athletes should include items related to their own awareness of symptoms or potential injury, while a survey administered to officials should include items related to means of communicating perceived symptoms to school personnel and the methods of injury reporting. In any future event, in order to make adequate comparisons and contrasts to this work, adherence to the central research questions of this work is necessary.

### **Conclusion**

The first legislative action governing sports-related concussion was passed in 2009 yet TBI have existed for centuries. The purpose of this study was to measure the effectiveness of Michigan's legislation on the reporting behavior of concussion events by four constituent groups: athletes, coaches, officials, and parents. Practicing athletic administrators in Michigan through a survey instrument and individual interviews provided data for this study.

The theoretical background for this study was provided from the theory of planned behavior (Ajzen, 1985) and the social identity theory (Tajfel, 1974). These two theories in concert help to explain why individuals choose to perform a specific behavior or not based on the individual's assessment of factors associated with decision-making. The results of this study, coupled with the theoretical background, confirm that since Michigan's legislation governing sports-related concussions was passed the reporting behavior of all four constituent groups have been positively affected according to the perception of the state's athletic administrators; though the constituent groups have progressed at varying rates.

Through all measurable data, the coaches group is perceived to have experienced the most effective behavioral change since Michigan's legislation was passed, and the



officials are continually lagging behind the other constituent groups. Coaches may be more likely to adhere to reporting requirements, knowing that another player may take the place of an injured athlete, while a parent has no substitute for their child. Data suggest that parents may be conflicted between protecting the safety of their children against the barriers of non-participation in athletic contests.

The findings of this study have suggested an initial assessment regarding the perceived effectiveness of Michigan's concussion legislation. The legislative impact on the reporting behavior of four constituent groups has been measured and documented. This study also provides insight and a framework for continued work into the relationship between concussion legislation and the behavior of those who the legislation impacts.

## References

- Ajzen, I. (1985). From intentions to actions: A theory of planned behavior. In J. Kuhl & J. Beckman (Eds.), *Action-control: From cognition to behavior* (pp. 11-39). Heidelberg, Germany: Springer.
- Almasy, S., & Martin, J. (2015). Judge approves NFL concussion lawsuit settlement. Retrieved from <http://www.cnn.com/2015/04/22/us/nfl-concussion-lawsuit-settlement/>
- Bourna, G. J., & Muizelaar, J. P. (1995). Cerebral blood flow in severe clinical head injury. *New Horizon*, 3(3), 384-394.
- Brady, D., & Brady, F. (2011). Sport-related concussions: Myths and facts. *National Association of School Psychologists Communique*, 39(8), 38-39.
- Canto, A. I., Chesire, D. J., & Buckley, V. A. (2011). On impact: Students with head injuries. *National Association of School Psychologists Communique*, 40(1), 1.
- Carroll, L., & Rosner, D. (2011). *The concussion crisis: Anatomy of a silent epidemic*. New York, NY: Simon & Schuster.
- Chrisman, S. P., Quitiquit, C., & Rivara, F. P. (2013). Qualitative study of barriers to concussive symptom reporting in high school athletics. *Journal of Adolescent Health*, 52, 330-335.
- Corbin, J. M., & Strauss, A. (1990). Grounded theory research: Procedures, canons, and evaluative criteria. *Qualitative Sociology*, 13(1), 3-21.
- Coronado, V. G., Haileyesus, T., Cheng, T. A., Bell, J. M., Haarbauer-Krupa, J., Lionbarger, M. R., ... & Gilchrist, J. (2015). Trends in sports-and recreation-related traumatic brain injuries treated in US emergency departments: The National

- Electronic Injury Surveillance System-All Injury Program (NEISS-AIP) 2001-2012. *The Journal of Head Trauma Rehabilitation*, 30(3), 185-197.
- Covassin, T., Elbin, R. J., & 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.
- Davies, S. C. (2011). Concussion awareness: Getting school psychologists into the game. *National Association of School Psychologists Communique*, 39(7), 1.
- Erdal, K. (2012). Neuropsychological testing for sports-related concussion: How athletes can sandbag their baseline testing without detection. *Archives of Clinical Neuropsychology*, 27(5), 473-479.
- Faure, C., & Pemberton, C. L. A. (2010). Concussion and the young athlete: Critical management strategies. *Journal of Physical Education, Recreation & Dance (JOPERD)*, 81(1), 19-26.
- Fink, J. S., Parker, H. M., Brett, M., & Higgins, J. (2009). Off-field behavior of athletes and team identification: Using social identity theory and balance theory to explain fan reactions. *Journal of Sport Management*, 23(2), 142-155.
- Fishbein, M., & Ajzen, I. (1975). Belief, attitude, intention, and behavior: An introduction to theory and research. Reading, MA: Addison-Wesley.
- Guskiewicz, K. M., Weaver, N. L., Padua, D. A., Garrett, W. E. (2000). Epidemiology of concussion in collegiate and high school football players. *The American Journal of Sports Medicine*, 28(5), 643-650.
- Hannah, J., Goldschmidt, D., & Flower, K. (2015). 87 of 91 tested ex-NFL players had brain disease linked to head trauma. Retrieved from <http://www.cnn.com/2015/09/18/health/nfl-brain-study-cte/>

- Hogg, M. A., & Terry, D. I. (2000). Social identity and self-categorization processes in organizational contexts. *Academy of Management Review*, 25(1), 121-140.
- Homer, & Rouse, W. H. D. (1963). *The Iliad: The story of Achilles*. Translated by W.H.D. Rouse. Toronto: New American Library of Canada.
- Kelly, J. P., & Rosenberg, J. H. (1997). Diagnosis and management of concussion in sports. *Neurology*, 48(3), 575-580.
- Kohn, L. T. (2010). Concussion in high school sports: Overall estimate of occurrence is not available, but key state laws and nationwide guidelines address injury management. Testimony before the committee on education and labor, House of Representatives. GAO-10-569T. (). US Government Accountability Office. 441 G Street NW, Washington, DC 20548. Retrieved from <http://search.proquest.com/docview/742874690?accountid=14584>
- Langlois, J., Rutland-Brown, W., & Thomas, K. (2005). The incidence of traumatic brain injuries among children in the United States: Differences by race. *Journal of Head Trauma Rehabilitation*, 20(3), 229-238.
- Marques, J. M., Yzerbyt, V. Y., & Leyens, J. P. (1988). The "black sheep effect": Extremity of judgments towards in-group members as a function of group identification. *European Journal of Social Psychology*, 18(1), 1-16.
- McAvoy, K. (2012). Return to learning: Going back to school following a concussion. *National Association of School Psychologists Communique*, 40(6), 1.
- McCrory, P., Meeuwisse, W. H., 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. *British Journal of Sports Medicine*, 47, 250-258.

- McLeod, S. A. (2008). Social Identity Theory. Retrieved from [www.simplypsychology.org/social-identity-theory.html](http://www.simplypsychology.org/social-identity-theory.html)
- Menon, D. K., Schwab, K., Wright, D. W., & Maas, A. I. (2010). Position statement: definition of traumatic brain injury. *Archives of Physical Medicine and Rehabilitation*, 91(11), 1637-1640.
- MHSAA. (2015). MHSAA protocol for implementation of national federation sports playing rules for concussions. Retrieved from <http://www.mhsaa.com/portals/0/documents/health%20safety/concussionreturnform.pdf>
- Michigan Department of Community Health. (2012). Public act 342. Retrieved from <http://www.legislature.mi.gov/documents/2011-2012/publicact/pdf/2012-PA-0342.pdf>
- Michigan Department of Community Health. (2012). Public act 343. Retrieved from <http://www.legislature.mi.gov/documents/2011-2012/publicact/pdf/2012-PA-0343.pdf>
- Michigan Department of Community Health. (2015). Michigan school building weekly report of communicable disease to local health department. Retrieved from <http://www.bldhd.org/pdfs/reporting.pdf>
- Michigan Department of Health and Human Services. (2015). Communicable disease reporting in Michigan. Retrieved from <http://www.michigan.gov/mdch/0,1607,7-132--12538--,00.html>
- Michigan Department of Health and Human Services. (2015). Mandated reporters are required by law to report. Retrieved from [http://www.michigan.gov/dhs/0,4562,7-124-7119\\_50648\\_44443-157836--,00.html](http://www.michigan.gov/dhs/0,4562,7-124-7119_50648_44443-157836--,00.html)

Mitchko, J., Huitric, M., Sarmiento, K., Hayes, G., Pruzan, M., & Sawyer, R. (2007).

CDC's approach to educating coaches about sports-related concussion. *American Journal of Health Education*, 38(2), 99-103.

Piebes, S. K., Gourley, M., & Valovich McLeod, T. C. (2009). Caring for student-athletes following a concussion. *The Journal of School Nursing*, 25(4), 270-281.

doi:10.1177/1059840509339782

Posten, M. (1998). Social identity theory: Sports affiliation and self-esteem. Living in a Social World. Retrieved from

<http://www.units.miamioh.edu/psybersite/fans/sit.shtml>

Register-Mihalik, J. K. (2010). An assessment of high school athletes' and coaches' knowledge, attitudes, and behaviors concerning sport-related concussion (unpublished doctoral dissertation). University of North Carolina, Chapel Hill.

Register-Mihalik, J. K., Guskiewicz, K. M., Valovich McLeod, T. C., Linnan, L. A., Mueller, F. O., Marshall, S. W. (2013). Knowledge, attitude, and concussion-reporting behaviors among high school athletes: a preliminary study. *Journal of Athletic Training*. (48)5, 645-653.

Staurowsky, E. J., Miller, K. E., Shakib, S., De Souza, M. J., Ducher, G., Gentner, N., ... & Williams, N. I. (2009). Her life depends on it II: Sport, physical activity, and the health and well-being of American girls and women. Women's Sports Foundation.

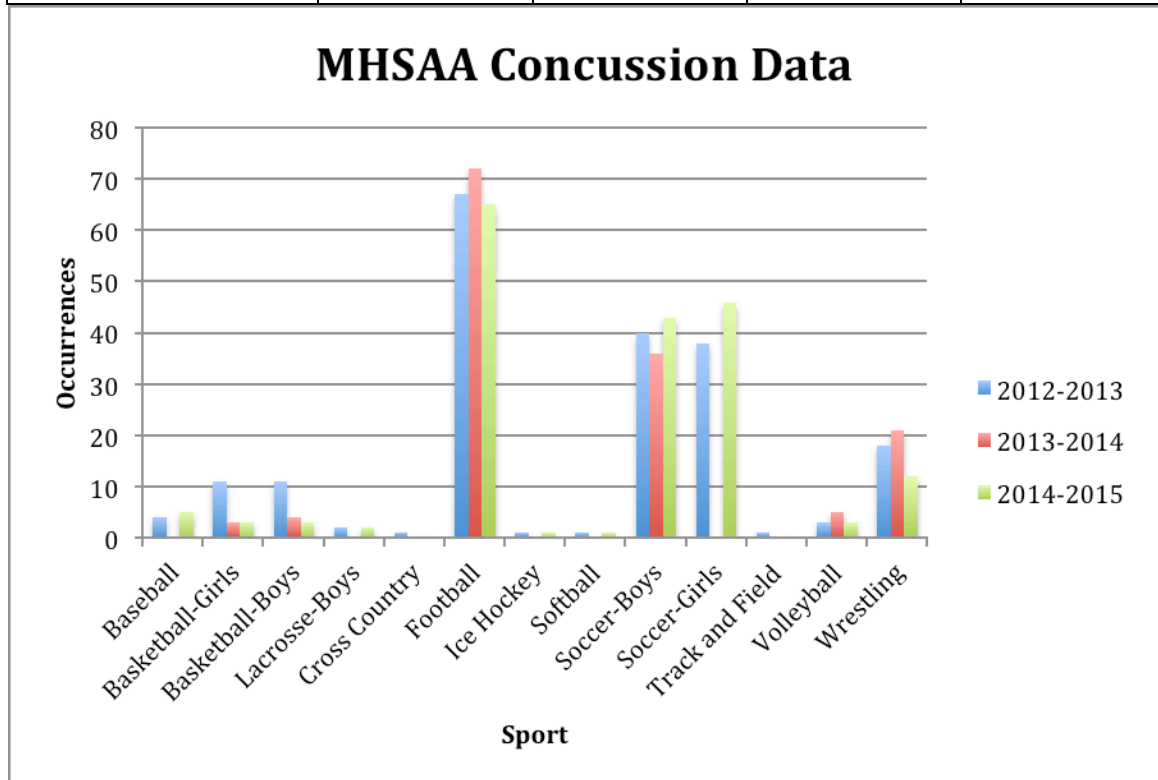
Stewart, A. N. (2012). Sports-related concussions: The development of a resource manual for educators to meet the needs of high school student-athletes before and after concussion. (Order No. 3503484, Alliant International University). ProQuest Dissertations and Theses, 165. Retrieved from

<http://search.proquest.com/docview/1009735793?accountid=14584>. (1009735793).

- Strauss, L. (11/2/2014). Concussion safety laws in every state [Blog post]. Retrieved from <http://www.momsteam.com/health-safety/every-state-has-youth-sports-concussion-safety-law>
- Tajfel, H. (1974). Social identity and intergroup behaviour. *Social Science Information*, 13(2), 65-93. doi:10.1177/053901847401300204
- Tajfel, H., & Turner, J. C. (1979). An Integrative Theory of Intergroup Conflict. In W. G. Austin, & S. Worchel (Eds.), *The Social Psychology of Intergroup Relations* (pp. 33-47). Monterey, CA: Brooks/Cole.
- Texas Compiled Statutes. (2007). Senate bill 82. Retrieved from <http://www.legis.state.tx.us/tlodocs/80R/billtext/html/SB00082H.htm>
- Tomei, K. L., Doe, C., Prestigiacomo, C. J., & Gandhi, C. D. (2012). Comparative analysis of state-level concussion legislation and review of current practices in concussion. *Neurosurgical Focus*, 33(6), E11.
- Wallace, J. (2015). Exploring differences that may contribute to high school athletes' knowledge of concussion and reporting behaviors (Unpublished doctoral dissertation). Michigan State University, East Lansing, MI.
- Zackery Lystedt Law. (2009). RCW 28A.600.190. 2009 c 475 § 2. Retrieved from <http://search.leg.wa.gov/search.aspx#document&searchQuery=&searchBase=RCW>

Appendix A

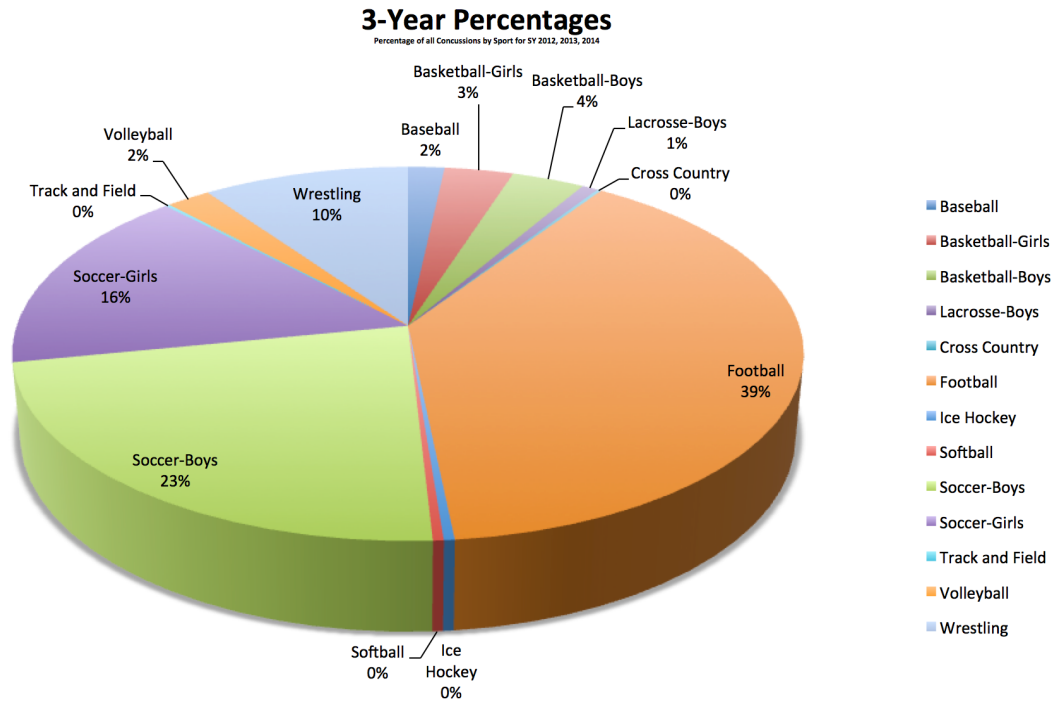
<b>MHSAA Concussion Data</b>				
	<b>2012-2013</b>	<b>2013-2014</b>	<b>2014-2015</b>	<b>3-Yr Total</b>
Baseball	4	0	5	9
Basketball-Girls	11	3	3	17
Basketball-Boys	11	4	3	18
Lacrosse-Boys	2	0	2	4
Cross Country	1	0	0	1
Football	67	72	65	204
Ice Hockey	1	0	1	2
Softball	1	0	1	2
Soccer-Boys	40	36	43	119
Soccer-Girls	38	0	46	84
Track and Field	1	0	0	1
Volleyball	3	5	3	11
Wrestling	18	21	12	51
<b>TOTAL</b>	<b>198</b>	<b>141</b>	<b>184</b>	<b>523</b>



M. Uyl (personal communication, April 15, 2014)

J. Roberts (personal communication, July 14, 2015)





M. Uyl (personal communication, April 15, 2014)  
 J. Roberts (personal communication, July 14, 2015)

Appendix B

**Educational Material for Parents and Students (Content Meets MDCH Requirements)**

Sources: Michigan Department of Community Health, CDC and the National Operating Committee on Standards for Athletic Equipment (NOCSAE)

**UNDERSTANDING CONCUSSION**

**Some Common Symptoms**

Headache	Balance Problems	Sensitive to Noise	Poor Concentration	Not “Feeling Right”
Pressure in the Head	Double Vision	Sluggishness	Memory Problems	Feeling Irritable
Nausea/Vomiting	Blurry Vision	Haziness	Confusion	Slow Reaction Time
Dizziness	Sensitive to Light	Fogginess	“Feeling Down”	Sleep Problems
		Grogginess		

**WHAT IS A CONCUSSION?**

A **concussion is a type of traumatic brain injury** that changes the way the brain normally works. A concussion is caused by a fall, bump, blow, or jolt to the head or body that causes the head and brain to move quickly back and forth. A concussion can be caused by a shaking, spinning or a sudden stopping and starting of the head. Even a “ding,” “getting your bell rung,” or what seems to be a mild bump or blow to the head can be serious. A concussion can happen even if you haven’t been knocked out.

You can’t see a concussion. Signs and symptoms of concussions can show up right after the injury or may not appear or be noticed until days or weeks after the injury. If the student reports any symptoms of a concussion, or if you notice symptoms yourself, seek medical attention right away. A student who may have had a concussion should not return to play on the day of the injury and until a health care professional says they are okay to return to play.

**IF YOU SUSPECT A CONCUSSION:**

- 1. SEEK MEDICAL ATTENTION RIGHT AWAY** – A health care professional will be able to decide how serious the concussion is and when it is safe for the student to return to regular activities, including sports. Don’t hide it, report it. Ignoring symptoms and trying to “tough it out” often makes it worse.
- 2. KEEP YOUR STUDENT OUT OF PLAY** – Concussions take time to heal. Don’t let the student return to play the day of injury and until a health care professional says it’s okay. A student who returns to play too soon, while the brain is still healing, risks a greater chance of having a second concussion. Young children and teens are more likely to get a concussion and take longer to recover than adults. Repeat or second concussions increase the time it takes to recover and can be very serious. They can cause permanent brain damage, affecting the student for a lifetime. They can be fatal. It is better to miss one game than the whole season.
- 3. TELL THE SCHOOL ABOUT ANY PREVIOUS CONCUSSION** – Schools should know if a student had a previous concussion. A student’s school may not know about a concussion received in another sport or activity unless you notify them.

**SIGNS OBSERVED BY PARENTS:**

- Appears dazed or stunned
- Is confused about assignment or position
- Forgets an instruction
- Can’t recall events prior to or after a hit or fall
- Is unsure of game, score, or opponent
- Moves clumsily
- Answers questions slowly
- Loses consciousness (even briefly)
- Shows mood, behavior, or personality changes

**CONCUSSION DANGER SIGNS:**

In rare cases, a dangerous blood clot may form on the brain in a person with a concussion and crowd the brain against the skull. A student should receive immediate medical attention if after a bump, blow, or jolt to the head or body s/he exhibits any of the following danger signs:

- One pupil larger than the other
- Is drowsy or cannot be awakened
- A headache that gets worse
- Weakness, numbness, or decreased coordination
- Repeated vomiting or nausea
- Slurred speech
- Convulsions or seizures
- Cannot recognize people/places
- Becomes increasingly confused, restless or agitated
- Has unusual behavior
- Loses consciousness (even a brief loss of consciousness should be taken seriously.)

**HOW TO RESPOND TO A REPORT OF A CONCUSSION:**

If a student reports one or more symptoms of a concussion after a bump, blow, or jolt to the head or body, s/he should be kept out of athletic play the day of the injury. The student should only return to play with permission from a health care professional experienced in evaluating for concussion. During recovery, rest is key. Exercising or activities that involve a lot of concentration (such as studying, working on the computer, or playing video games) may cause concussion symptoms to reappear or get worse. Students who return to school after a concussion may need to spend fewer hours at school, take rests breaks, be given extra help and time, spend less time reading, writing or on a computer. After a concussion, returning to sports and school is a gradual process that should be monitored by a health care professional.

Remember: Concussion affects people differently. While most students with a concussion recover quickly and fully, some will have symptoms that last for days, or even weeks. A more serious concussion can last for months or longer.

To learn more, go to [www.cdc.gov/concussion](http://www.cdc.gov/concussion).

**Parents and Students Must Sign and Return the Educational Material Acknowledgement Form**

<http://www.mhsaa.com/schools/health-safety-resources/heads>

**CONCUSSION AWARENESS**

**EDUCATIONAL MATERIAL ACKNOWLEDGEMENT FORM**

By my name and signature below, I acknowledge in accordance with Public Acts 342 and 343 of 2012 that I have received and reviewed the Concussion Fact Sheet for Parents and/or the Concussion Fact Sheet for Students provided by \_\_\_\_\_

Sponsoring Organization

\_\_\_\_\_  
Participant Name Printed

\_\_\_\_\_  
Parent or Guardian Name Printed

\_\_\_\_\_  
Participant Name Signature

\_\_\_\_\_  
Parent or Guardian Name Signature

\_\_\_\_\_  
Date

\_\_\_\_\_  
Date

Return this signed form to the sponsoring organization that must keep on file for the duration of participation or age 18.

Participants and parents please review and keep the educational materials available for future reference.

<http://www.mhsaa.com/schools/health-safety-resources/heads>

## Appendix D

## Survey Format and Questions

## Concussion Perceptions

Thank you for your willingness to participate in this survey. Your responses are anonymous and your time is appreciated.

1. Please indicate the primary level in which you administer the interscholastic athletic program in your school district.
  - High School
  - Middle School
  
2. Have you earned an academic degree in athletic administration or a related field or have you received National Interscholastic Athletic Administrators Association (NIAAA) certification (CMAA, CAA, RAA, RMSAA)??
  - Yes
  - No
  
3. Have you received certification as an athletic trainer (ATC) or any other medical training or certification that is relevant to the duties of athletic administration or concussion management??
  - Yes. (If Yes, please explain your relevant training or certification in the text field below.) \_\_\_\_\_
  - No

In the following sections, please indicate your level of agreement with the following statements from low to high.

4. Students experiencing concussion-like symptoms report those instances to medical or school personnel more often than they did prior to Michigan's concussion laws of 2013.
  - Strongly Disagree
  - Disagree
  - No Change in Reports
  - Agree
  - Strongly Agree
  
5. Students that are being monitored and treated for concussion events are more concerned with their symptoms than they were prior to Michigan's concussion laws of 2013.
  - Strongly Disagree
  - Disagree
  - No Change in Concern
  - Agree
  - Strongly Agree

6. Contest officials remove students from participation that exhibit concussion-like symptoms for sideline evaluation more frequently than they did prior to Michigan's concussion laws of 2013.
- Strongly Disagree
  - Disagree
  - No Change in Removal Frequency
  - Agree
  - Strongly Agree
7. Contest officials report instances of students being removed from participation to school officials more frequently than they did prior to Michigan's concussion laws of 2013.
- Strongly Disagree
  - Disagree
  - No Change in Report Frequency
  - Agree
  - Strongly Agree
8. Coaches remove students from participation who demonstrate concussion-like symptoms more frequently than they did prior to Michigan's concussion laws of 2013.
- Strongly Disagree
  - Disagree
  - No Change in Removal Frequency
  - Agree
  - Strongly Agree
9. Coaches are more aware of the risks associated with participation for students suffering concussions or concussion-like symptoms than they were prior to Michigan's concussion laws of 2013.
- Strongly Disagree
  - Disagree
  - No Change in Coach Awareness
  - Agree
  - Strongly Agree
10. Coaches are more supportive of students suffering concussions through return to play (RTP) protocols than they were prior to Michigan's concussion laws of 2013.
- Strongly Disagree
  - Disagree
  - No Change in Support
  - Agree
  - Strongly Agree

11. Parents of students exhibiting concussion-like symptoms acknowledge the presence of those symptoms more often than they did prior to Michigan's concussion laws of 2013.

- Strongly Disagree
- Disagree
- No Change in Parental Acknowledgement
- Agree
- Strongly Agree

12. Parents of students suffering concussions or demonstrating concussion-like symptoms report those instances to medical or school personnel more often than they did prior to Michigan's concussion laws of 2013.

- Strongly Disagree
- Disagree
- No Change in Parental Reports
- Agree
- Strongly Agree

13. Please indicate the ways in which you become aware of concussion events. Check all that apply.

- Personal Observation
- MHSAA Officials Report
- Personal Contact (face-to-face or electronic)
- Written Documentation from Physician
- Contact from Emergency (EMT) Personnel
- Other \_\_\_\_\_

14. When you are made aware of concussion events, which individuals take part in the student's aftercare program. Check all that apply.

- Coach
- Parent / Guardian
- Student
- Physician
- Athletic Trainer
- Teacher
- Guidance Counselor
- Athletic Director
- Principal
- School Nurse
- Other \_\_\_\_\_

In the following section, please respond true or false to the statements based on your general perception.

15. Students and their families take concussion events seriously.

- True
- False

16. School personnel are deliberate about following steps to return an athlete to full participation.

- True
- False

17. School personnel are deliberate about academic accommodations to reintegrate an injured athlete back into the classroom.

- True
- False

18. The coaching staff at my school is knowledgeable about recognizing concussion symptoms.

- True
- False

19. Comments related to concussions like, "He just got his bell rung", are no longer mentioned by coaches at my school.

- True
- False

20. Comments related to concussions like, "He just got his bell rung", are no longer used by parents at my school.

- True
- False

Please provide contact information in the box below if you are willing to be selected for a thirty-minute interview to be conducted at your location by telephone, or other ways, including Skype or Face Time.

## Appendix E

INTERVIEW QUESTIONS – Interviews are conducted with voluntary participation of survey respondents. The surveys are confidential, however, respondents volunteering to participate in a private interview will be asked to provide contact information that will only be visible to the researcher. The survey will inform voluntary survey respondents that the researcher may conduct individual interviews to gather further qualitative data. The researcher will conduct a random sample of voluntary interview participation and contact all of the voluntary survey respondents and inform them whether or not they have been selected for an individual interview.

1. Individual interviews will reflect survey questions.
2. Interviews will ask voluntary participants to clarify with anonymous examples, instances of relevant survey topics and responses.
3. Interview subjects will be informed through their signed consent forms that their responses will be kept confidential as well as any comments made throughout the interview.
4. The researcher will ask the following open-ended questions to solicit responses:
  - a. Share with me your beliefs on how Michigan's legislation has impacted coaches, officials, parents, and athletes and their behavior regarding the reporting of possible concussions.
  - b. Describe the way or ways that you become aware of possible concussions suffered by athletes in your school.
  - c. Discuss whether or not you believe Michigan's concussion legislation is challenging traditional beliefs and practices about reporting these injuries.
    - i. (For example purposes, traditional practices may involve dismissal of potential injuries with statements like, "he just got his bell rung", "she has a big game coming up and she can't miss it", "the team/coach needs her", or, "if he misses game time, he'll miss out on a scholarship".



## Appendix F

Act No. 342  
Public Acts of 2012  
Approved by the Governor  
October 23, 2012  
Filed with the Secretary of State  
October 23, 2012

EFFECTIVE DATE: 91st day after final adjournment of 2012 Regular Session

**STATE OF MICHIGAN**  
**96TH LEGISLATURE**  
**REGULAR SESSION OF 2012**

**Introduced by Senators Proos, Brandenburg, Marleau, Hansen and Jones**  
**ENROLLED SENATE BILL No. 1122**

AN ACT to amend 1978 PA 368, entitled "An act to protect and promote the public health; to codify, revise, consolidate, classify, and add to the laws relating to public health; to provide for the prevention and control of diseases and disabilities; to provide for the classification, administration, regulation, financing, and maintenance of personal, environmental, and other health services and activities; to create or continue, and prescribe the powers and duties of, departments, boards, commissions, councils, committees, task forces, and other agencies; to prescribe the powers and duties of governmental entities and officials; to regulate occupations, facilities, and agencies affecting the public health; to regulate health maintenance organizations and certain third party administrators and insurers; to provide for the imposition of a regulatory fee; to provide for the levy of taxes against certain health facilities or agencies; to promote the efficient and economical delivery of health care services, to provide for the appropriate utilization of health care facilities and services, and to provide for the closure of hospitals or consolidation of hospitals or services; to provide for the collection and use of data and information; to provide for the transfer of property; to provide certain immunity from liability; to regulate and prohibit the sale and offering for sale of drug paraphernalia under certain circumstances; to provide for the implementation of federal law; to provide for penalties and remedies; to provide for sanctions for violations of this act and local ordinances; to provide for an appropriation and supplements; to repeal certain acts and parts of acts; to repeal certain parts of this act; and to repeal certain parts of this act on specific dates," (MCL 333.1101 to 333.25211) by adding section 9155.

*The People of the State of Michigan enact:*

Sec. 9155. (1) Before the expiration of 90 days after the effective date of this section, the department shall develop, adopt, or approve educational materials on the nature and risk of concussions.

(2) Before the expiration of 90 days after the effective date of this section, the department shall develop, adopt, or approve a concussion awareness training program in an electronic format that includes all of the following:

(a) The nature and risk of concussions.

(b) The criteria for the removal of an athlete from physical participation in an athletic activity due to a suspected concussion and his or her return to that athletic activity.

(c) The risks to an athlete of not reporting a suspected concussion and continuing to

physically participate in the athletic activity.

(3) As soon as they are available, the department shall make the educational materials and training program required under this section available to the public on the department's internet website. The department shall make the training program available to all individuals required to participate in the program under section 9156 and to any interested individual including school personnel, coaches, parents, students, and athletes.

(4) As used in this section and section 9156:

(a) "Appropriate health professional" means a health professional who is licensed or otherwise authorized to engage in a health profession under article 15 and whose scope of practice within that health profession includes the recognition, treatment, and management of concussions.

(b) "Athletic activity" means a program or event, including practice and competition, during which youth athletes participate or practice to participate in an organized athletic game or competition against another team, club, entity, or individual. Athletic activity includes participation in physical education classes that are part of a school curriculum.

(c) "Concussion" means a type of traumatic brain injury as recognized by the centers for disease control and prevention. A concussion may cause a change in a person's mental status at the time of the injury, including, but not limited to, feeling dazed, disoriented, or confused, and may or may not involve a loss of consciousness. A concussion may be caused by any type of accident or injury including, but not limited to, the following:

(i) A fall.

(ii) A blow, bump, or jolt to the head or body.

(iii) The shaking or spinning of the head or body.

(iv) The acceleration and deceleration of the head.

(d) "Organizing entity" means any of the following:

(i) A school.

(ii) A state or local parks and recreation department or commission or other state or local entity.

(iii) A nonprofit or for-profit entity.

(iv) A public or private entity.

(e) "School" means a nonpublic school, public school, or public school academy as those terms are defined in section 5 of the revised school code, 1976 PA 451, MCL 380.5.

(f) "Youth athlete" means an individual who participates in an athletic activity and who is under 18 years of age.

Enacting section 1. This amendatory act does not take effect unless House Bill No. 5697 of the 96th Legislature is enacted into law.

Secretary of the Senate  
Clerk of the House of Representatives  
Approved  
Governor

Act No. 343  
Public Acts of 2012  
Approved by the Governor  
October 23, 2012  
Filed with the Secretary of State  
October 23, 2012

EFFECTIVE DATE: 91st day after final adjournment of 2012 Regular Session

**STATE OF MICHIGAN  
96TH LEGISLATURE  
REGULAR SESSION OF 2012**

**Introduced by Reps. Hooker, Yonker, Heise, Kurtz, Pscholka, Rendon, Jenkins,  
Potvin, Lyons, Ouimet, Johnson, Haines, Rutledge, Liss, Walsh and Outman**

**ENROLLED HOUSE BILL No. 5697**

AN ACT to amend 1978 PA 368, entitled "An act to protect and promote the public health; to codify, revise, consolidate, classify, and add to the laws relating to public health; to provide for the prevention and control of diseases and disabilities; to provide for the classification, administration, regulation, financing, and maintenance of personal, environmental, and other health services and activities; to create or continue, and prescribe the powers and duties of, departments, boards, commissions, councils, committees, task forces, and other agencies; to prescribe the powers and duties of governmental entities and officials; to regulate occupations, facilities, and agencies affecting the public health; to regulate health maintenance organizations and certain third party administrators and insurers; to provide for the imposition of a regulatory fee; to provide for the levy of taxes against certain health facilities or agencies; to promote the efficient and economical delivery of health care services, to provide for the appropriate utilization of health care facilities and services, and to provide for the closure of hospitals or consolidation of hospitals or services; to provide for the collection and use of data and information; to provide for the transfer of property; to provide certain immunity from liability; to regulate and prohibit the sale and offering for sale of drug paraphernalia under certain circumstances; to provide for the implementation of federal law; to provide for penalties and remedies; to provide for sanctions for violations of this act and local ordinances; to provide for an appropriation and supplements; to repeal certain acts and parts of acts; to repeal certain parts of this act; and to repeal certain parts of this act on specific dates," (MCL 333.1101 to 333.25211) by adding section 9156.

*The People of the State of Michigan enact:*

Sec. 9156. (1) An organizing entity that is subject to this section shall ensure that it is in compliance with this section before it sponsors or operates an athletic activity in which youth athletes will participate, if that athletic activity is subject to this section.

(2) Before a youth athlete may participate in an athletic activity sponsored by or operated under the auspices of an organizing entity, the organizing entity shall do all of the following:

(a) Comply with all the requirements of this section with regard to its coaches, employees, volunteers, and other adults who are involved with the participation of youth athletes in athletic activity sponsored by or operated under the auspices of that organizing entity and who are required to participate in the concussion awareness training program developed under section 9155.

(b) Provide the educational materials developed under section 9155 to each youth athlete

who participates in an athletic activity sponsored by or operated under the auspices of the organizing entity and a parent or guardian of the youth athlete.

(c) Obtain a statement signed by each youth athlete and a parent or guardian of the youth athlete acknowledging receipt of the educational material developed under section 9155. The organizing entity shall maintain the statement obtained under this subdivision in a permanent file for the duration of that youth athlete's participation in athletic activity sponsored by or operated under the auspices of that organizing entity or until the youth athlete is 18 years of age. Upon request, the organizing entity shall make the statements obtained under this subdivision available to the department.

(3) A coach or other adult employed by, volunteering for, or otherwise acting on behalf of an organizing entity during an athletic event sponsored by or operated under the auspices of the organizing entity shall immediately remove from physical participation in an athletic activity a youth athlete who is suspected of sustaining a concussion during the athletic activity. A youth athlete who has been removed from physical participation in an athletic activity under this subsection shall not return to physical activity until he or she has been evaluated by an appropriate health professional and receives written clearance from that health professional authorizing the youth athlete's return to physical participation in the athletic activity. The organizing entity shall maintain a written clearance obtained under this subsection in a permanent file for the duration of that youth athlete's participation in athletic activity sponsored by or operated under the auspices of that organizing entity or until the youth athlete is 18 years of age. Upon request, the organizing entity shall make the written clearance obtained under this subsection

(4) This section does not apply to an athletic activity sponsored by or operated under the auspices of an organizing entity if all of the following requirements are met:

(a) The entity is a member of a private nonprofit multisport statewide interscholastic athletic association.

(b) The athletic activity is governed by a rule established by the interscholastic athletic association described in subdivision (a), which rule establishes concussion protocols that are substantially similar to or more stringent than the concussion protocols in the training program developed, adopted, or approved under section 9155 and the removal from and return to physical activity requirements of this section, and includes an enforcement mechanism on its members.

(5) This section does not apply to an entity that would otherwise be considered an organizing entity under this section if the primary focus of the program or event sponsored by or operated under the auspices of that entity is not the participation in an organized athletic game or competition but that participation is only incidental to the primary focus of the program or event.

Enacting section 1. This amendatory act does not take effect unless Senate Bill No. 1122 of the 96th Legislature is enacted into law.

Clerk of the House of Representatives  
Secretary of the Senate  
Approved  
Governor