

**ANALYSIS OF THE MODERN FOOTBALL CRISIS:
HISTORICAL PERSPECTIVE AND RECOMMENDATION**

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ABSTRACT

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The modern football crisis details the concussion problem currently occurring across every facet of American football, from the professional level all the way down to the youth game. A contemporary and polarizing topic, concussions in football has led many to question whether the game can survive in its present form for future generations. Can football become safer and adapt to survive this current dilemma?

To understand and evaluate this problem I will first go back in time to the turn of the twentieth-century. I will analyze the history of the game and a similar health crisis that occurred in collegiate football in the early 1900s. I will then compare and contrast the twentieth-century crisis to the modern one, and analyze what lessons were learned and what can be applied in attempting to solve the concussion issue. Lastly, I will offer my own safety recommendations for the game, and provide hope that this issue can be solved to ensure football's survive for the foreseeable future.

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Introduction

It is January 9, 2016. The Cincinnati Bengals are hosting the Pittsburgh Steelers in the AFC Wild Card game in Cincinnati, Ohio. As temperatures dip into high the 30's a freezing rain descends on the stadium, helping to turn an already physical game into one of the dirtiest of the NFL season. With 22 seconds left and a 1-point deficit, Ben Roethlisberger took the snap and turned up field looking for his star wide receiver, Antonio Brown. Brown dashed about ten yards up field and then 45 degrees towards the center, a simple post route. As Brown turned, Roethlisberger launched a bullet towards Brown. While Brown lunged for the ball, linebacker Vontaze Burfict came from the middle of the field at full speed and lowered his shoulder into Brown, attempting to jar the ball loose in case Brown made the catch. The pass from Roethlisberger was too high, and as Brown came down empty handed his head made contact with Burfict's shoulder. Brown was knocked unconscious immediately, his body snapping to the turf like a ragdoll. The scene was, for lack of a better word, unsightly. Burfict was assessed a penalty for unnecessary roughness and suspended. Brown was knocked out of the playoffs with a concussion and has no recollection of the play in question.

It is December 17, 2014 and the Chicago Bears are playing the Detroit Lions on a crisp winter day in Chicago. It is the fourth quarter and the Bears are trailing. The quarterback for the Bears, Jimmy Clausen, receives the snap and darts right as the pocket collapses looking to gain only 2 yards that he needs for the first down. As he crosses the line and attempts to slide, the Lions 350 pound defensive lineman Ezekiel Ansah lowers his helmet into Clausen's. Ansah's hit is late, unnecessary, and dangerous. As the players helmets connect Clausen's head rebounds into the turf and his helmet comes loose. Flags immediately go flying and Ansah is assessed a personal foul for unnecessary roughness. Almost as quickly as the flags come out Clausen is on

his feet charging at Ansah for what he perceived to be a dirty hit. Clausen appeared fine. He finished the game and passed the post game concussion check performed by team doctors. However, that night Clausen was in a Chicago area hospital suffering from delayed concussion symptoms, likely received from the hit by Ansah. Clausen would not play in the Bears season finale, and only 5 more games in his entire professional career.¹

Concussions come in all shapes and sizes, and as the above story emphasizes not only from helmet to helmet hits. Sometimes they are identified by immediate symptoms, and other times they take hours or even days to appear. They can be from direct head-on impact, or sudden and powerful rotational force. Defined by the Brain Injury Research Institute, a concussion, also known as a mild traumatic brain injury (MTBI), is any blow, bump, or jolt to either the head or body that causes the brain to move rapidly inside the skull.² Your brain is a soft organ that sits inside your skull. It is the most important organ in your body and incredibly sensitive. Inside of the skull, the brain sits in a cavity filled with spinal fluid and protected by the hard bone of our craniums. If you are hit hard enough, any of those bumps and jolts can cause the brain to move rapidly or violently, often times smashing against the sides of skull. This is how a concussion occurs. A good way to picture this is imagine taking a bunch of jell-o, putting it inside of a clear hard plastic container, and then shaking the container. Thomas Jones, a former NFL running back and one of the top 25 leading rushers in history, describes in a YouTube video what it feels like to get a concussion. He describes it like an out of body experience. He gives multiple examples, including seeing stars once, seeing black spots, or seeing double. He has been hit and

¹ “Injury to Chicago Bears QB Offers New Lesson in Concussions.” *NBCNews.com*, NBCUniversal News Group, 23 Dec. 2014, www.nbcnews.com/health/health-news/injury-chicago-bears-qb-offers-new-lesson-concussions-n274126.

² “What Is a Concussion?” *What Is a Concussion? | Brain Injury Research Institute*, www.protectthebrain.org/Brain-Injury-Research/What-is-a-Concussion-.aspx.

been in the game and had no idea what was going on around him. He describes it as “hearing but not listening.” Jones describes one of his best games ever. After being hit hard in the head early in the game, he would stay in and end up running for 200 yards against Buffalo. He has no recollection of the day’s events. He had to watch film the next day to remember them. Jones has seen people bleeding from nose and bleeding from the ears. He says football players are trained like warriors, to pick themselves back up and keep fighting at all costs.³ Symptoms of a concussion include headache, loss of consciousness, confusion, amnesia, dizziness, nausea, and vomiting. In a fast paced and physical game like football, punishing hits happen hundreds of times. For the most part these hits aren’t concussive enough to be described as an MTBI, but they are sub-concussive and over time can culminate in long-term neurodegenerative decay. Years of sub-concussive hits to the head from a lifetime of playing football lead to changes in brain chemistry and structure, the early onset of diseases like Alzheimer’s and dementia, and sometimes even death. From how humans are made, evidenced by their physiological make-up, one may ask, are humans supposed to play a game like football?

I pondered this idea of humans and football while watching the Sunday slate of NFL games a little over a year ago. As I learned more and more about the concussion and brain problems that surround the game, coupled with reports of declining youth football participation, I became increasingly concerned. Although I knew football would not cease to exist anytime soon, I wondered whether the sport would go the way of cigarettes and die out a few decades in the future. As a long-time fan of the game I started with the simple question, can I save football? Obviously, that is a pipe dream. I cannot save football on my own, the problems the sport are facing are far too complex. But what I can do, I realized, is study the head injury problems facing

³ “Thomas Jones on Being in the NFL.” *BrainLine*, 9 June 2017, www.brainline.org/video/thomas-jones-being-nfl.

the sport, and offer my own recommendations for change with the hope that my ideas can be built upon for the future.

As I began my research, I learned about a football crisis that occurred in the early 20th century, one that threatened to end the game just as it was becoming increasingly popular. I came to a stark realization that the crisis in the 20th century and the one occurring today are eerily similar, as if history is repeating itself. Within this historical context, I found a unique angle to bring to the head trauma debate.

In this paper, I will first examine the early 20th century football crisis and how it was resolved, as well the causes of the modern football crisis. I will then compare and contrast the modern crisis with the 20th century one, identifying what was learned in the resolution of that crisis, the important changes implemented to the game, and how that can be applied today. I will then offer recommendations across the football hierarchy, from high school to the NFL, in how schools, players, coaches, administrators, and owners can better understand, diagnose, treat, and prevent concussions and traumatic brain injury.

Chapter 1: The Twentieth-Century Football Crises

October 1905 was a month of celebration for many in Washington D.C. The Treaty of Portsmouth had just been signed in New Hampshire, effectively ending the Russo-Japanese War. Theodore Roosevelt, like most people in the world, should have been elated, as he had helped mediate between the two sides and encouraged peace talks between the foes (he would later win the Nobel Peace Prize for his efforts). For Roosevelt, this was the beginning of a newly powerful American identity. It was his dream for America to be an important voice in the international system. However, Roosevelt was distraught. On a separate battleground far from the coast of Manchuria, a war was raging that threatened to kill one of Roosevelt's favorite pastimes, a pastime he felt embodied everything it meant to be American. After years of stalemates and arbitration between purists and progressives, the future of the game of football was at a standstill. Two opposing sides were locked in bitter debate, with neither willing to yield. Roosevelt had for years tried to stay out of the fray, but knew now that if he did not act quickly, football as he knew it would cease to exist. In a last ditch effort, the 26th President of the United States sat down at his desk and started to write.

To understand the heated football conflict occurring in 1905 (and one which would occur again in 1909), we must first understand how it got to a boiling point. The roots of American football can be traced back to the 19th century, evolving as a rugby variant from Victorian England brought over by immigrants and tradesman. At the time, the game of football looked very different than it does today. The game was often played at colleges and universities without a single defined set of rules or structure. This meant that across the schools the game often took a very different format, either being most similar to soccer, similar to rugby, or a hybrid of the two sports. It wasn't until 1869 that the first official college football game was played, with

Rutgers beating Princeton 6-4. Like the other versions of football going on at the time, this game consisted of 25 players on each side (unlike the usual 11) and was akin more to a game of soccer than the football we experience today. Around 1870, the first Princeton-Rutgers game officially jumpstarted the sports interest among colleges in the Northeast. Other Ivy League schools such as Columbia, Harvard, and Yale soon followed, and developed their own versions of football. In 1873, most of the football playing schools (with the exception of Harvard) worked together in an attempt to outline a set of uniform rules. Nothing really came of it and ultimately Harvard's rugby-heavy version of the game that focused on carrying the ball won in popularity and was adopted by the other schools, which preferred this to the soccer-dominant version they were accustomed to playing. A new meeting was needed to formalize the rules even further, as the group figured that establishing some sort of playing style would stimulate interest and help to organize more formal aspects of play. On November 23, 1876 representatives from Princeton, Yale, Columbia, and Harvard, met at the Massasoit House in Massachusetts to form the Intercollegiate Football Association. There they formally adopted Harvard's rugby rules with some modified aspects for scoring, and decided to reconvene once a year to continue the process of formalization.⁴

The 20 years from 1876-1896 would turn out to be another pivotal period for the game, as a man by the name of Walter Camp helped football truly evolve.⁵ Camp was a Yale student in the late 19th century who developed an early and avid affinity for football. It was Camp's style of

⁴ Gutowski, Nicholas. "PENN FOOTBALL: ORIGINS TO 1901 Varsity Team History." *Penn Football in the 1800s, Varsity Team History: University of Pennsylvania University Archives*, 2006, www.archives.upenn.edu/histy/features/sports/football/1800s/origins.html.

⁵ Pearson, Steve. "Football Origins, Growth and History of the Game." *History of The Game Of Football Including The NFL and College Football*, www.thepeoplehistory.com/football/history.html.

play and determination to implement certain rules that would lay the formal groundwork that dictates the modern game. With Camp present at nearly every rules meeting, the Ivy League came together to implement even more changes than before, including lowering the number of players to 11 per side (Camp's idea), instituting the line of scrimmage (Camp's idea), and creating the concept of having set plays (also Camp's idea). Camp wanted football to become more strategic, rather than the current free-for-all.

As the years went on and new rules were instituted, two important changes to blocking and tackling would help create the 1905 crisis. In 1888, blocking with your arms outstretched and tackling below the waist was legalized. Before, opponents could only block with their bodies and tackle above the waist. Now, anything above the knees was fair game and blockers could actually influence the movement of the ball. As the game play spread across the field, these rule changes brought players even closer together. With the forward pass still illegal, plays would often include every member of a side moving together in one mass in an attempt to score. This created giant scrums with the defense also attempting to use every one of their players to prevent an offensive score. The ball carrier would often leap over the mass of bodies trying to gain yardage, forcing the defense to send over a member of their own to meet them in midair. A premium was now placed on bigger, stronger players and nutrition was emphasized. The results however were gruesome, and often resulted in very little yardage gain. Injuries began to accumulate, and the *New York Times* ran a story in 1893 describing the result of the mass plays. "Every day," the *Times* reported, "one hears of broken heads, fractured skulls, broken necks, wrenched legs, dislocated shoulders, broken noses, and many other incidents." Unfortunately, these statements weren't far from the truth. Death from broken necks, internal bleeding, broken arms, and broken legs defined the 1893 season. Violence had always been a by-product of the

game, but the public now began to see it as an integral unavoidable characteristic. Years would pass and not much would change as the game blossomed, but so did the violence. Public fear grew but the spectacle went on, often times drawing 10,000 or more fans to the biggest games. That all changed during 1905 season. In that year alone, at least 18 people died from playing football with more than 150 seriously injured.⁶ According to an article published in the Washington Post at the time, 45 football players (almost all from the Ivy League) died from 1900 to 1905. During this time, a common tactic was for the opposing team to identify and incapacitate the other team's best player. A brief controversy erupted when Harvard accused Dartmouth players of intentionally breaking the collarbone of their star player, Matthew W. Bullock, because he was black. When confronted by a Harvard player about the alleged racism, a Princeton player responded, "We didn't put [Bullock] out because he is a black man. We're coached to pick out the most dangerous man on the opposing side and put him out in the first five minutes of the game." In denying one charge the Princeton player only confirmed another, that premeditated violence was not a by-product of the game, it was ingrained in it. Unsurprisingly, the public was shaken, but it wasn't until November of 1905 that the situation reached a fever pitch.

In an already noticeably rough game against NYU on November 25, 1905, Union College halfback Harold Moore took a handoff and cut right around the scrum. At that moment an NYU defender broke through the Union line and decimated Moore with his body, hard enough to throw Moore backwards to the turf knocking him unconscious. Moore was rushed to the hospital but died shortly thereafter from a cerebral hemorrhage.⁷ On campus, many mourned the loss of the

⁶ Klein, Christopher. "How Teddy Roosevelt Saved Football." *History.com*, A&E Television Networks, 6 Sept. 2012, www.history.com/news/how-teddy-roosevelt-saved-football.

⁷ Somers, Wayne. *Encyclopedia of Union College History*. Union College Press. 2003

popular and well-liked Moore, but across the country backlash was swift. Moore's brutal death served as a catalyst for a group of university leaders who sought to abolish football. Led by the president of Harvard, Charles Eliot, a new sociopolitical movement decrying football as a barbaric, homicidal game arose. Many believed football had no place in a civilized society. Columbia, Duke, Union, and Northwestern quickly banned the sport while Stanford and California switched to rugby, and many more schools were prepared to follow their example.

With death at its doorstep football needed a savior, and his name was President Theodore Roosevelt. As an avid outdoorsman and athletic enthusiast, Roosevelt had always possessed an affinity for football throughout his teen and adult life. It was only his nearsightedness that prevented him from joining the Harvard football team during his time at the school from 1876 – 1880. Roosevelt had always been vocal about his support for football, noting its importance as a game of skill and strength. Before his ascendance to the presidency, Roosevelt helped revive the Harvard – Yale rivalry games that had been cancelled for two years following a particularly disturbing clash in 1894 known as “The Bloodbath at Hampden Park.” Roosevelt, in one of his most famous speeches called *The Strenuous Life*, spoke of the importance of physicality and grit, on how America could become a powerful and dominant nation, and emphasized the parallels between a strong country and a population invested in athletic toughness. Although he had remained largely on the sidelines during the previous decade or so of football debate, he always spoke highly of the game and advocated among his peers the importance of the sport. He once even said to Camp, “I personally like football the best, and I would rather see my boys play it than see them play any other. I have no patience with the people who declaim against it because it necessitates rough play and occasional injuries.”⁸ Roosevelt, like most of the public at the time,

⁸ Watterson, John S. "Political Football: Theodore Roosevelt, Woodrow Wilson and the Gridiron

was particularly upset about the fatalities occurring on the football field. In October 1905, just before the death of Harold Moore, Roosevelt summoned the representatives and coaches from Yale, Harvard, and Princeton (the collegiate powerhouses at that time) to the White House in an attempt to unify and reform the game. Roosevelt himself had a personal vested interest in protecting the players, as his son Theodore Jr. was playing for the Harvard freshman football team at the time. Roosevelt revered toughness and strength, but admonished any inkling of purposeful brutality or targeting in sport. Interestingly, Roosevelt himself did not come up with the idea for the meeting. It was actually a plea from his long time friend Endicott Peabody, the founder of the Groton School for Boys and an avid football fan. He believed cleaning up the game and formalizing even more rules would help revolutionize it. He urged Roosevelt to summon the best schools in the country as leaders of this movement. In his plea, Peabody said “You are the one man, so far as I know, who could accomplish this without much effort.” Roosevelt agreed, and the meeting was decided. The schools released a statement condemning the violence and pledging to keep the game clean, a move Roosevelt hoped would set an example for the rest of the country to follow. Though largely devoid of concrete changes, it emphasized the most important aspect for Roosevelt, which was a commitment to fair play. While the meeting offered promise, Moore’s brutal death occurred only one month later.⁹ Again, Roosevelt was involved in bringing together footballs best minds hoping to institute more widespread change. This new conference known as the Intercollegiate Athletic Association, the forerunner to the National Collegiate Athletic Association (NCAA), approved a number of radical rule changes to be implemented starting in the 1906 season. Mass formations that were

Reform Movement." *Presidential Studies Quarterly*, vol. 25, no. 3, 1995, pp. 555-564.

⁹ Zezima, Katie. “How Teddy Roosevelt Helped Save Football.” *The Washington Post*, WP Company, 29 May 2014, www.washingtonpost.com/news/the-fix/wp/2014/05/29/teddy-roosevelt-helped-save-football-with-a-white-house-meeting-in-1905/.

popular at the time were now abolished from competition and a neutral zone so referees could see plays between the offense and defense was created. The first down distance was also doubled, from 5 yards to 10 yards. Most importantly, the forward pass was legalized, significantly opening up the field of play. Camp, now a staunch defender and football purist, actually hated the forward pass but was overruled at the meeting.¹⁰ Before, the game had been solely about running and kicking but now attacks could come from the air. At the conference the members would define unsportsmanlike conduct, cut the game time from seventy to sixty minutes, and create personal fouls. Noticeably, Roosevelt stayed removed from this rule change committee, but he had been the one who brought together the second meeting, combining two rival factions of men who wanted to change the game but had different ideas. Initially, these two sides were bitter opponents. One, led by Walter Camp, sought to institute minimal change, seeing gradual reform as better for the sport. The other faction, led by NYU chancellor Henry McCracken, saw death on the field as tragic but preventable, and believed in sweeping reform to save the sport. After negotiating another cease-fire of sorts and merging the two groups, Roosevelt removed himself from the process, believing that football had to change absent of political interference. Roosevelt wanted to create change, not micromanage it. He felt that if the most respected men in football agreed amongst themselves (rather than a “casual” fan like Roosevelt) to improve the game, then lasting reform might realistically emerge. Roosevelt, akin to his foreign policy, did not want the public to see him as a puppeteer for football.¹¹ While these

¹⁰ Miller, John J. “How Teddy Roosevelt Saved Football.” *The Wall Street Journal*, Dow Jones & Company, 21 Apr. 2011, www.wsj.com/articles/SB10001424052748703712504576242431663682162.

¹¹ Miller, John J. *The Big Scrum: How Teddy Roosevelt Saved Football*. Pg. 184-200. Harper Perennial, 2012.

changes did not eliminate the deaths in college football (eleven still occurred in both 1906 and 1907) football enjoyed a relatively peaceful next few years. The public appreciated the changes, and football's popularity bloomed. Furor over football's brutality subsided for a while, and the rule changes of 1905-1906 had produced their intended effect of taking away the football prohibitionist's basis of argument. The period of peace was actually very short lived, because the prohibitionists mounted a last ditch effort in 1909 to abolish the game.

Looking back at the 1905 football crisis, history often emphasizes Roosevelt's involvement (maybe to a fault) while never fully embracing a few key players and events that sparked true institutional reform. To begin, NYU Chancellor Henry McCracken played as integral a role as any in mitigating the 1905 crisis. McCracken, believing football to be a valuable and entertaining sport, knew it was necessary to remove its ugly aspects. He had also become disillusioned with the existing rules committee led by Camp. After Moore's death, the old committee met but nothing was changed. Afraid to irrevocably alter the game, the initial rules committee could not agree on any sweeping changes, changes that in reality were necessary to ensure its evolution. McCracken decided enough was enough, and formed his own committee to draw up new rules. Eventually McCracken, with the help of Roosevelt, inspired Bill Reid (Harvard's coach at the time) to join the new committee. As mentioned above, the committees merged and football survived.

Besides McCracken, there are two additional people who deserve more recognition for helping to change football, Henry Beach Needham and Woodrow Wilson. Needham was a writer for *McClure's Magazine*, and unlike most of the mud-slinging, yellow journalists of the time used investigative and fact-based research for his pieces. He was the journalist who reported on the targeting controversy between Harvard and Yale mentioned above. Needham was unique

among his peers as a supporter of football. Unlike Charles Eliot and many other outspoken critics of the game at the time, Needham enjoyed football, and simply sought to report on its issues in an effort to help reform it. Needham championed for professionalism and fair play, which caught the eye of Roosevelt. He held Needham in high regard and often called him a friend, because Needham was the antithesis of many sensationalist journalists who Roosevelt referred to as “muckrackers.”¹² Needham’s reporting on the attack on Mathew Bullock, as well as the quasi-legal practice of players jumping from college to college in a season, played into Roosevelt’s hatred of corruption. Needham exposed other illegal practices, like allowing athletes to cheat on exams and receiving financial assistance not available to other students. Although Roosevelt took exception to some of Needham’s articles because he felt they were inflammatory, they were the truth. Needham helped incite public outrage against football, but it was necessary for the game to change.

Woodrow Wilson is the last individual in need of recognition, because his involvement is relatively unknown but critical to the 1909 crisis. In 1909, Navy quarterback Edwin Wilson was paralyzed in a game against Villanova and later died. A few weeks later, Army left tackle Eugene Byrd died from his injuries suffered in a game against Harvard. The next month, University of Virginia halfback Archer Christian died from a brain hemorrhage after injuring himself in a game against Georgetown and falling into a coma. The *New York Times* immediately called for football’s abolishment. While these deaths were noticeably sensationalized in the national press, the renewed calls to ban football weren’t without merit. The *Chicago Tribune* found that from 1908 to 1909, 31 deaths occurred, most at the high school level. The public saw this as proof football had resorted to its brutal ways. Change was needed, and quickly. Wilson

¹² Miller, John J. *The Big Scrum: How Teddy Roosevelt Saved Football*. Harper Perennial, 2012. Pg. 176.

(like Roosevelt) never participated in playing football on the varsity squad at Princeton because of health issues. When he became a professor at Princeton in 1891, Wilson served as the chairman of the faculty committee for outdoor sports. Wilson held football in high regard, often noting its importance to Princeton as a developmental tool for the students. Wilson defended football in the 1890s during the first calls for its abolition. He believed (like Roosevelt) that football helped develop moral qualities more than any other athletic sport, emphasizing that the game fostered traits such as precision, presence of mind, and endurance. Wilson, unlike Roosevelt, seemed to predict the debacle facing football instead of simply reacting to it. Wilson saw a need for reform but was hesitant to throw Princeton into any committee that was not going to address the systemic issues facing the sport. He felt that focusing solely on the injuries was hindering the fact that this was not the only change football needed. If football could change its culture and the rules, the injuries would subside. Wilson championed the need for revision once again, while continuously defending football for its benefits. Following the 1909 season several new rules were ratified. Ultimately, it was decided that 7 men must line up at the line of scrimmage, pushing and pulling the ball carrier became illegal, and only one man could now go into motion in the backfield before the ball was snapped. For the most part, these quick changes did help to quell the uproar, and serious injury and death dropped after 1910. The creation of the fourth down in 1912, the implementation of roughing-the-passer in 1914, and relaxing of forward pass rules in 1918 created a much more presentable game. Point totals as well were raised, with field goals being worth 3 points and touchdowns being worth 6 points. Interestingly, Roosevelt and Wilson's opinions towards football are noticeably similar to their political

approach to capitalism and free markets. They believed if one could rid a worthy activity of its abuses, free of these constraints that activity will flourish.¹³

¹³ See “Political Football” Citation

Chapter 2: The Modern Football Crisis

After the early 20th century crisis football went through a number of changes to become what it is today. Around the 1920's, professional leagues began to arise. As the NFL struggled to maintain popularity, college football's most popular players, including Jim Thorpe and Red Grange, started making the transition to the NFL. With star players beginning to join its ranks, the NFL finally was able to establish a fan base and grow. Football in the south also saw a tremendous rise in popularity, with schools like Vanderbilt, Alabama, and Georgia Tech, becoming regional powerhouses. At this time, schools often played only regional rivals, opting to travel as little as possible to play other teams. As bowl games and athletic conferences were introduced into the sport in the 1930's, football teams and their followers grew from solely regional to national prominence. National rankings by the Associated Press and national media coverage would also bolster college football's popularity. It was not until 1958 that the NFL finally overtook college football in terms of popularity. Quickly, football became America's favorite sport.

Many things have changed since the early 1900s for the game of football, but as some people like to say, history repeats itself. In an interesting development akin to the early 20th football crisis, a similar modern sentiment of social accountability that has pushed for reformation in football and an emphasis on player health has arisen. While for the last few decades there have been team physicians on the sidelines caring for the physical ailments of the players, the idea of protecting and treating injuries that cannot be seen is a new concept. What I call today's "Modern Football Crisis" is a fight against this often unseen foe, the concussion, and more importantly what repeated concussions cause, which is Chronic Traumatic Encephalopathy

(CTE). Before I dive into this modern crisis it is also important to understand the history of both concussions and CTE. Neither are new, but they are often misunderstood.

The word “concussion” has actually been around for over a thousand years, often referred to as a “shaking of the brain” by the ancient Greeks. Its relationship with football is not new either. In 1906, the Harvard College team doctors released a report in the *Boston Medical and Surgical Journal* that detailed the injuries sustained by the team during the 1905 season. One injury stood out, concussion of the brain. The study’s authors noted that players often saw the injury as a joke (sound familiar?), while the medical community saw it as a real problem. Around this time head injuries, especially from train collisions, were studied to note the possibility of long term behavioral consequences. In football players, it would be decades before this same issue would be studied. What astounded doctors and some of public was not the fact that the concussions were occurring, but how frequently they were occurring. Nearly every game in the early 20th century had a report of a concussion. Players rarely noticed that their fellow teammates were not of proper mental faculty, and only sideline doctors diagnosed the concussions. While most still believed that the true danger lay in the visible injuries like broken bones and gashes, there was a group of physicians who urged for the widespread recognition of the invisible. Some physicians disclosed their frustrations with their peers, urging that head injuries be treated the same as other injuries, but it was difficult to convince people of their severity because it was difficult to study. X-rays around this time were not widespread, having only been discovered a decade earlier in 1895. People also wanted explanations, which physicians at the time could not give. Limitations in imaging meant that explaining the long-term effect of brain injuries and concussions was almost impossible. Even the doctors who championed an increased importance in concussion treatment could not agree on how concussions changed the brain. They postulated

that it might change the molecular composition of the brain (which it does!), but they could not prove it. Some doctors preached the link between concussions and insanity, but could only study brains of the deceased. It was difficult to link head injury as a cause of death, or even what effect it had on the mortality of the patient.¹⁴ In 1911, a report in the *Journal of the American Medical Association* highlighted the work of a team of German psychiatrists, who argued that a collection of mental disorders shared a common factor, previous head trauma of patients. They concluded that although no outcome was the same, there was a link between head trauma and concussions to physical and behavioral alterations. The report noted that the head injuries were not acute injuries. They would have an effect on the patient's future life.¹⁵

As quick as the concussion issue in football began, it faded into obscurity. Writers focused on how the game was changing for the better and schools often focused on how important the game was for the development of young men, rather than the dangers they faced on the field. The rise of helmets and new padding also stymied any push for head injury reform. Beginning in 1939, all college football players were required to wear helmets. Over the years, helmets evolved, first with the creation of plastic helmets in the 1950's and then the inclusion of the facemask in 1956. In the 1960's, plastic helmets became more durable so they would not shatter on hard impact. Finally, air bladders were included inside the helmets in the early 1970s to absorb impact, and the four-point chinstrap became mandatory in college football after 1976. While all of these advancements helped improve on the visible head injuries, they did little to

¹⁴ Harrison, Emily A. "The First Concussion Crisis: Head Injury and Evidence in Early American

Football." *American Journal of Public Health*, May 2014, www.ncbi.nlm.nih.gov/pmc/articles/PMC3987576/.

¹⁵ B. Glueck, "Traumatic Psychoses and Post-Traumatic Psychopathic States," *Journal of the American Medical Association* 56, no. 13 (1911): 943–948.

help the invisible ones. In fact, they probably made it worse. The NFL and NCAA in the past had given little attention to the idea that playing football could have lasting and profound effects on player mental health later in life. Interest in concussions wouldn't rise again until the 1990's,

Ignorance of the concussion issue can be highlighted in an article from 1994 that details Troy Aikman's concussion suffered before the Super Bowl that year. This was the highest profile case in decades, as Aikman was the most important player, on the best football team in the country, playing on its biggest stage. The article highlights the unfortunate thinking of the time, which was that concussions were a by-product of the game and had only short-term effects on the brain. The article discusses serious concussions players received. The players discussed memory loss, confusion, and loss of motor skills, almost in a joking matter. All players seemed eager to return to the field as quickly as possible. Players such as Roger Staubach believed they could recover quickly from a serious concussion. Many in football did not understand the severity of having a concussion, nor did they understand the long-term effects.¹⁶ For years, many in the sport did not even think it was worth discussion. A decade later, that all changed.

In 2002, a Nigerian born doctor by the name of Benett Omalu discovered Chronic Traumatic Encephalopathy (better known as CTE) in football players. Omalu was working in Pittsburgh at the coroner's office at the time when he was brought the body of Mike Webster, a famous ex-football player for the Pittsburgh Steelers. A hometown favorite, Webster had died at the age of 50 from a heart attack, but it was his irrational behavior before he died that had many, including Omalu, wondering just what had ailed Webster. After retirement, Webster suffered

¹⁶ Litsky, Frank. "A Common N.F.L. Question: How Many Fingers Do You See?" *The New York Times*, The New York Times, 25 Jan. 1994, www.nytimes.com/1994/01/26/sports/super-bowl-xxviii-a-common-nfl-question-how-many-fingers-do-you-see.html.

from a number of cognitive disorders including amnesia, dementia, depression, muscle and bone pain, as well as a pattern of odd and irrational behavior. When Omalu began to examine Webster, he discovered clumps of tau proteins scattered throughout the brain, which when built up slowly begin to kill brain cells. CTE had been diagnosed in boxers before, but never in a football player. This realization was shocking to many. People began to postulate that repeated high impact collisions have a profound effect on the brain.

The NFL always knew it had a concussion problem, but was reluctant to address these concerns. For a while they outright denied it. After Omalu's discovery, the league was slow to address the CTE concern most likely because they feared it would have such a tremendous ramifications on the game (and their wallets). Realistically, the league knew about the problems of concussions long before Omalu. In 1994, the NFL formed the Mild Traumatic Brain Injury Committee to begin studying the effects concussions have on the brain. In 1997 the American Academy of Neurology published a guideline for players returning to action after suffering from a concussion. The guidelines, among many other things, recommended removing players knocked unconscious from the rest of the game. However the NFL rejected these guidelines, stating "they see people all the time that get knocked out briefly and have no symptom." In 1999, the NFL's retirement board quietly started giving out millions of dollars in disability payments to former players suffering sever cognitive decline. In 2000, a study presented at the American Academy of Neurology found that 61 percent of former NFL players sustained at least one concussion, and that 79 percent of those injured said they were not forced to leave the game. In 2002, Omalu's research finally confirmed that repeated injuries to the brain suffered while playing football created long lasting and significant cognitive damage. In 2005, Omalu published his findings in the journal *Neurosurgery*, but the MTBI attacked his report, demanding it be

removed. While this is going on, the list of players with cognitive impairment, mood swings, depression, aggression, and early death grew. In 2007 Dr. Ira Casson, co-chairman of the MTBI, conducted an interview on HBO. He said that there is no link between head injuries and depression, dementia, or early onset Alzheimer's. The NFL reiterated to its players that research shows that having one or two concussions does not lead to long-term damage if managed properly. Finally, after years of neglect, the NFL in 2009 acknowledged the effects of head trauma and concussions on long-term health issues.¹⁷ It was a step in the right direction, but a step too small and far too late.

The current atmosphere of holding coaches and organizations accountable for the health of their players later in life is relatively new. Beginning with the discovery of CTE in football players and coupled with the NFL's inherent disinterest in admitting that football had a profound effect on the brain, a new social movement has begun to address and attempt to improve the game of football.

Over the course of the last decade, interest in understanding, preventing, and treating head injuries has exploded. Initially, the cerebral dangers of playing the game were exclusively focused at the professional level. Recent studies over the last few years, as well as high profile cases involving student-athletes and the brain have brought these issues to the public consciousness. For example, a study at the Cleveland Clinic in 2011 found that "college football players may experience significant and long-term brain damage due to hits to the head even when they do not suffer a concussion." The researchers scanned the brains of 67 college football players before and after games during the 2011 season, and discovered that the 40 players who

¹⁷ Petchesky, Barry. "A Timeline Of Concussion Science And NFL Denial." *Deadspin*, Deadspin.com, 30 Aug. 2013, deadspin.com/a-timeline-of-concussion-science-and-nfl-denial-1222395754.

had received the hardest hits had elevated levels of an antibody linked to brain damage.¹⁸ In another study conducted by the Laureate Institute for Brain Research in Tulsa, Oklahoma, 50 NCAA Division 1 football players and 25 non-players had their brains scanned and cognitive performance tested. The researchers were focusing on the hippocampus, an area in the brain that performs an important role in memory formation and emotional control. The data was disturbing. One subset of the football players, a group of 25 that had no history of concussions, had hippocampal volumes that were approximately 14 percent smaller than the control group of 25 non-football players. The other subset of 50 players, 25 players who had reported histories of at least one clinically diagnosed concussion, had hippocampal volumes that were on average 25 percent smaller than the control group. In their cognitive tests, the football players scored lower than the non-football players. This study is just one of many linking football and contact sports to permanent and important alterations in the brain. At Purdue University, researchers studying high school football players over a time period of two seasons found changes in brain activity that could be correlated significantly to the number of hits to the head, as well as changes to the brain that have often been linked to CTE. At Dartmouth University, researchers ran tests on college football and hockey players over the course of two seasons, with not a single player sustaining a reported concussion. However, researchers still found small but significant changes to the brains of these players and noted that the players who performed the worst on end-of-season cognition tests also had the greatest brain changes.

That is all just college and high school. Players who have continued on to the NFL have even more disturbing results. A study of 13 retired NFL players found major, and until that time

¹⁸ Myerberg, Paul. "Study Indicates Brain Injuries among College Football Players." *USA Today*, Gannett Satellite Information Network, 7 Mar. 2013, www.usatoday.com/story/gameon/2013/03/07/study-links-brain-injuries-to-ncaa-football-players-hits-that-do-not-cause-concussions/1970177/.

previously unobserved, abnormalities in frontal lobe brain activity. A similar study of retired NFL players linked head trauma and the repeated occurrence of concussions to reduced levels of growth hormone and testosterone, as well as pituitary dysfunction. A study funded by the National Institute of Health (NIH) found that physical abnormalities and signs of injury in the brains of concussion patients continues to be present months after symptoms ease. A study funded by the NFL Charity found that football players that had not been diagnosed with concussions showed physical changes in their brains from as little as 10 to 15 hard hits, and even months after the season had ended, half of them still showed signs in their brain scans of mild brain injury. Boston University, one of the leading research institutions studying the brains of deceased players, has released three revolutionary reports highlighting the link between NFL players and CTE. In 2012, it released its first study documenting 15 cases of CTE in the brains of former NFL players, which doubled the number of documented cases of CTE.¹⁹ In 2014, the study grew. Researchers at BU revealed that the brains of 96% of deceased NFL players suffered from CTE (76 of 79). The most recent study, published in July 2017, is also the most disturbing. Of the 111 brains of former NFL players studied as part of the new research, researchers found 110 of them had evidence of CTE. The brains ranged from players at the age of 23 all the way to 89 and included every position. The study suggests that length of play is correlated to more severe cases of CTE. Although these studies suffer from the same selection bias, in that all the brains were donated and the sample size was small, they strengthen the link between football and CTE.

¹⁹ Press, Associated, and Khadrice Rollins. "Timeline: 6 Studies That Helped Link NFL to CTE." *SI.com*, www.si.com/nfl/2017/07/26/nfl-concussion-head-trauma-studies-football-timeline.

Together with these studies, a number of high profile cases involving player health and head trauma have captivated the public awareness. In 2013, former high school and college standout Michael Keck died from a previously undiagnosed congenital heart defect. A football player throughout childhood and into college, Keck was diagnosed with at least 10 concussions throughout his playing career. After the last concussion, Keck retired from the game, but began to experience many of the common symptoms of chronic brain trauma, including headaches, sensitivity to light, mood swings, and violent outbursts. With the suicide of Junior Seau, a former star NFL player later diagnosed with CTE, Keck believed he too might have the disease. After Keck's passing, his wife donated his brain to researchers at Boston University. There, researchers discovered the worst case of CTE they had seen in a patient of his age.²⁰

Arguably, the most famous and contemporary case of CTE found in a football player is Aaron Hernandez. Hernandez was a star tight end at the University of Florida and later in the NFL for the New England Patriots. Hernandez had it all. He was one of the best tight ends in the NFL, playing for one of the best teams in the country and was paid millions for his skills. Hernandez was arrested in June of 2013 for the murder of Odin Lloyd. Four years later Hernandez committed suicide in his prison cell in Massachusetts. Between his arrest and death, Hernandez would be charged with 3 murders and implicated in the shooting of three other people in two separate incidents that date all the way back to his time at the University of Florida.²¹ What would drive such a successful and high profile individual to commit such heinous crimes?

²⁰ "Football Player had 'Worst' Brain Trauma Seen in Someone So Young, Doctor Says"
<http://www.nbcnews.com/health/health-news/football-player-had-worst-brain-trauma-seen-someone-so-young-n489856>

²¹ Steele , David. "Aaron Hernandez Timeline: From Murders and Trials to Prison Suicide." *Sporting News*, 22 Sept. 2017, www.sportingnews.com/nfl/news/aaron-hernandez-news-suicide-dead-murder-trial-timeline-patriots-guilty-acquitted-odin-lloyd/1886y82a8bgyx123qxcgg04lb5.

For one, Hernandez grew up in a rough area of Florida and had ties to street gangs growing up. There were rumors he still associated with a lot of his former friends from back home. While some would label Hernandez a thug, gang member and expect this to explain his behavior, I believe there is something more. In September of 2017 it was announced that Hernandez suffered from a severe case of CTE. Hernandez's family had donated his brain to researchers at Boston University. What researchers found when studying Hernandez's brain was startling. Hernandez had Stage 3 CTE, never before seen in a patient of his age. Hernandez's CTE was worse than Michael Keck's. After cutting into the brain researchers found the ventricles dilated, in response to brain shrinking. The brain had lost a lot of tissue, and membranes that were supposed to be firm were thin and gelatinous. There were large, abnormal holes throughout Hernandez's brain. The hippocampus, central to our memory function, had shrunk. The fornix had atrophied and the frontal lobe, which is responsible for problem solving, judgment, and impulse control, was littered with tau protein. The amygdala, which is responsible for emotional regulation, emotional behavior, anxiety, and fear, was also severely damaged. Now, these findings do not paint a conclusive explanation of Hernandez's behavior, but they suggest another aspect of Hernandez's downfall. It is hard to ignore the fact that multiple areas of Hernandez's brain responsible for memory, judgment, emotion, and decision-making were injured.²² It makes one wonder whether CTE is partly to blame for the death of Aaron Hernandez.

Recently, there has been a growing trend of collegiate and NFL players retiring from football to protect their health, including risk of brain injury. From 2010 to 2012, there were 12

²² Kilgore, Adam. "Aaron Hernandez Suffered from Most Severe CTE Ever Found in a Person His Age." *The Washington Post*, WP Company, 9 Nov. 2017, www.washingtonpost.com/sports/aaron-hernandez-suffered-from-most-severe-cte-ever-found-in-a-person-his-age/2017/11/09/fa7cd204-c57b-11e7-afe9-4f60b5a6c4a0_story.html.

concussion related retirements in college football. From 2013 to 2015, at least 26 players from major college football programs retired due to concussions.²³ These retirements include players such as former University of Texas quarterback David Ash, University of Connecticut quarterback Casey Cochran, University of West Virginia quarterback Clint Trickett, University of Michigan lineman Jack Miller, and University of Wake Forest running back Tyler Henderson.²⁴ These studies and unplanned retirements highlight the need for more extensive and prolonged research, and should illustrate to the college conferences and schools the importance of protection of their football players, as well the need for accurate diagnoses and treatment.

²³ “No Man’s Land: When Concussions Force a College Football Player to Retire.”
<http://america.aljazeera.com/watch/shows/america-tonight/articles/2015/12/1/casey-cochran-ncaa-football-concussions-retire.html>

²⁴ “I Need My Brain: College Athletes in Football and Other Sports are turning to Early Retirement, Choosing to End their Athletic Careers to Avoid the Long Term Effects of Concussions.” <https://www.insidehighered.com/news/2015/05/18/wary-concussions-college-athletes-choose-early-retirement>

Chapter 3: Comparing and Contrasting Twentieth-Century Crisis to Present

In attempting to find solutions to the modern football dilemma, comparing and contrasting this crisis with the one that occurred in the 20th century can offer valuable insight with the ultimate goal of taking the lessons learned 100 years ago and applying them to now. Some of the similarities are stark and others are a stretch, but each offers a unique perspective to the discussion.

To begin, one of the most important aspects of both crises was the time in which they occurred. The early 1900's was a unique time for America. It was a period of progressive social environment (called the Progressive Era) in which reformers worked to improve American society and counteract the effect of industrialization. It was generally defined as a period of intense social and political reform meant to improve society for the better. This attitude of progressivism touched every aspect of American society that was deemed of in need of fixing. Although it was focused on the workplace, it influenced politics and even football. The Progressive Era saw a crackdown on corruption, new protections for consumers and workers were put into place, and women won the right to vote. It was a unique time to be American. Theodore Roosevelt's presidency coincided with this time of American progress. Roosevelt's foreign policy paralleled new understandings in the American ideal. If America was going to improve its standing at home, it was time for America to do that abroad as well. Roosevelt held steadfast in his belief of an energetic American foreign policy, one that boosted America's might to deter foreign adversaries. That ideal also came out in Roosevelt's support of the Square Deal, Roosevelt's domestic program to improve consumer protection, control of operations, and conservation.²⁵ Interestingly, for all of Roosevelt's strong beliefs in improving society,

²⁵ "The Presidency of Theodore Roosevelt (Article)." *Khan Academy*,

opponents of football cited societal improvement as their reason for wanting the sport banned. How could it be that a sport as dangerous as football could be allowed in a progressive society? If the dangers in the workplace were being fixed, shouldn't the dangers in football be fixed as well?

Like the early 1900s, one can argue that a renewed progressive social environment has come to define twenty-first century American society. There seems to be an ever-increasing emphasis on workplace conduct, while promoting awareness on pressing issues and improving overall society. No longer is harassment, inappropriate conduct, or discrimination allowed in the workplace. Americans advocate more and more for safer working conditions not just at home, but also abroad. Society now preaches healthier lifestyles, overall wellness, and an improving quality of life. Similar to the 20th century, critics of football currently see it as a dangerous sport that takes a lasting toll on those who play it. It is difficult to condone a game that we now know can cause CTE, changes in brain function and structure, and the early onset of other neurological diseases. Colleges and universities that promote higher learning and education face a dilemma now as they did in the 1900's. Do you promote a game you know is dangerous for your students?

Another similarity between both crises is the power of public outrage and social accountability. In the 1900s the public outrage nearly led to the destruction of football. It was outrage that was grounded in social accountability to protect the players, one that exists again today. At a more micro level, the public outrage was fueled by journalism. In the 20th century, newspapers were the best and most popular source of information. While often the brutality in football was sensationalized, there were some like Henry Needham who reported the true,

www.khanacademy.org/humanities/ap-us-history/period-7/apush-age-of-empire/a/the-presidency-of-theodore-roosevelt.

investigative facts to help the game reform and progress, not die out entirely. Today, that idea remains true. Journalism in TV, newspapers, and magazines helps bring to light many of the issues that plague football. Published research has fueled the safety debate and led to new technologies and increased scrutiny. One big difference, however, between now and 100 years ago is social media.

Social media has fundamentally altered our lives. Whether this is good or a bad, its affect on social accountability and awareness cannot be ignored. Social media has become an incredibly important tool for player advocacy and accountability for player protection. Before the rise of social media, colleges and the NFL could often get away with putting players back into games that did not deserve to be there. Sometimes it is the player's fault for wanting to play at all costs, but often coaches see winning as more important than long-term safety. Now more than ever, at the click of a button, we have access to game film and a platform for players to voice their opinions. Twitter, Facebook, and Instagram are a few of the social media platforms the public and players use to distribute information. Nationally televised college football games are watched by millions of viewers, and coaches and football programs are scrutinized more than ever. Every play is cataloged, every angle captured. If a misstep happens, people will call out universities and NFL teams. Here are a few examples from college: In 2014, University of Michigan quarterback Shane Morris took a brutal hit from a University of Minnesota linebacker in the fourth quarter of a blowout loss. Upon standing up, Morris was noticeably dazed, stumbling across the field and needing the support of his teammates to return to the sideline. It was quite obvious Morris had suffered a concussion. University of Michigan head coach Brady Hoke removed Morris from the game and replaced him with backup Devin Gardner. However, to the shock of many, Morris returned to the game just a few plays later. Not surprisingly, outrage

after the game was swift and widespread. The video clip was trending on Twitter and the story reported by nearly every major sports and news outlet. Hoke did not have any good explanations for an outraged public as to why an obviously concussed quarterback was allowed to return to play, even going so far as to shift blame to Morris.²⁶ As the coach, the well-being of the players is a core responsibility, and Hoke had obviously failed in this regard. Hoke was fired at the end of the season.

Two similar incidents happened during the 2015 season. In the first week of the season, University of Wisconsin linebacker Michael Caputo suffered a major blow to the head while tackling a University of Alabama running back. Caputo was so disoriented after the play that he attempted to line up on the wrong side of the ball. He was removed from the game, but returned to play the week after. The medical staff did not diagnose him with a concussion. One month later, Kansas State quarterback Joe Hubener sustained a head injury on the opening drive of the game. After replacement quarterback Kody Cook was taken out with a shoulder injury, Hubener finished the game for Kansas State. He was also not diagnosed with a concussion but admitted later to being dizzy and disorientated after the hit, a distinctive sign of a concussion.²⁷ That is just college. The NFL still has issues with this every year. Just this month (November 2017) two NFL teams had their concussion policies scrutinized and are under investigation. The Indianapolis Colts allowed their quarterback Jacoby Brissett return to the game after taking a vicious helmet-to-helmet hit and rearing on the ground clutching his head after. According to

²⁶ Sherman, Rodger. "Brady Hoke Made Apparently Concussed QB Play." *SBNation.com*, SBNation.com, 27 Sept. 2014, www.sbnation.com/college-football/2014/9/27/6855599/brady-hoke-left-a-clearly-concussed-shane-morris-in-the-game-has-no.

²⁷ Moore, Jack. "Is the NCAA Doing Enough to Protect College Football Players from Concussion?" *The Guardian*, Guardian News and Media, 19 Nov. 2015, www.theguardian.com/sport/2015/nov/19/college-football-ncaa-concussion.

the Colts, Brisset passed all tests for concussion protocol by two doctors and returned to the game. The next day he was put into concussion protocol. He obviously should not have been put back into the game, and people on Twitter were quick to scrutinize the team immediately after the hit took place. A few days after the Brisset incident, the quarterback for the Seattle Seahawks, Russell Wilson, also was subject to a brutal hit. He went into the medical tent for a brief moment and returned after one play. He obviously received no test or treatment, and the NFL announced the Seahawks would be fined for violating concussion protocol.²⁸ In all of these instances, public outcry was prompt, due largely in part to attention on social media and sports commentators. In an era before social media, some of these events would have gone largely ignored. We live at a time where advocacy and social responsibility are pillars of our societal norms. The public and the players have a responsibility to themselves and future players to continue to hold coaches, staff, and each other responsible for change and the improved health and mental well being of all football players.

Aside from that brief detour, there are a number of other similarities between the current football crisis and the 20th century one worth analyzing. Most notably are the calls for rule changes and safer plays. In the 20th century, that came in the form of mass change like instituting the line of scrimmage, creating the forward pass, outlawing scrums, and creating personal fouls. The game, however, might be in need of more. It has often been discussed eliminating the kickoff because of the intensity and speed at which the plays occur, not to mention how rarely any ever result in significant yardage gains. The NFL and NCAA moved the kickoff line from the 30 to the 35, and increased the touchback from the 20 to the 25-yard line. Although this has

²⁸ Kilgore, Adam. "After a Bad Week, the NFL's Concussion Protocol Comes under Scrutiny Once Again." *The Washington Post*, WP Company, 16 Nov. 2017, www.washingtonpost.com/news/sports/wp/2017/11/16/after-a-bad-week-the-nfls-concussion-protocol-comes-under-scrutiny-once-again.

increased touchbacks, that might not be enough. Personal fouls and targeting penalties have garnered more importance in recent years. It is refreshing that these penalties are strictly enforced now, but it was not always so. They did not even exist back in 1905, but were instituted as part of the sweeping changes that year.

In terms of differences, there are many. For one, the point in time at which these crises happened or are happening is very different. They are similar in terms of being pivotal times for the sport, but different in immediacy. For the crisis that occurred in 1905, football was still in an infantile state. It had really only existed for around two decades and looked nothing like it does now. At the time, football had the real possibility that it could cease to exist. In modern times, that reality is starkly different. Football is far too large and powerful to immediately come to an end, as well as being worth many billions of dollars. However the signs are there that the sport could decline over the next few decades. This only emphasizes the importance of trying to find a solution now. Most importantly, and in my opinion the biggest difference, is the difference between the visible and the invisible. For the 20th century, the crisis was driven by physical injuries that could be seen. You can see a broken back, arm, or leg. However now, the threat is invisible. You cannot see inside a brain. You cannot see CTE or a concussion. Rule changes and reform in the 20th century provided immediate feedback. You could see the difference it was making. Now, no one really knows which rule changes have the best impact. You can only confirm a CTE diagnoses in a deceased individual. Feedback from new rule changes and regulation will take years to study to determine its impact. This makes the current crises all the more difficult to solve.

Chapter 4: Recommendations for Change

In attempting to help the game of football change and adapt, and ensure its survival for future generations, I feel it necessary that I offer my own recommendations for improvement. The process starts with analyzing history. Obviously the men responsible for fixing football in the early 20th century did something right. Their changes helped establish the game across the country and create a sport that is now the most popular in America. So what did they do right, and what can we learn from their trials that can be applied to the modern football crisis?

The first thing they did right was understand that saving football meant significant changes needed to occur. Football appeared fundamentally broken and no small tweaks would produce the desired effect. Additionally, they understood where the problems were, which was mainly mass plays and enforcing the rules. Hearing the qualms of the public also helped the reformers. New penalties that protected players, opened up the field, and forced officials to be vigilant in their enforcement were powerful tools for change. The emphasis was now on protecting players and creating a cleaner game. Another important aspect was a group of people who were willing to be radical in their change. This group was led by NYU Chancellor Henry McCracken, who openly opposed the football establishment in favor of change (which they perceived as radicalism). For McCracken it was necessary improvement. Another aspect was political pressure. Roosevelt and Wilson both had vested interest in the game. When you have powerful people, such as the President of the United States, advocating for change things often get done. New technologies, like the addition of helmets, pads, and facemasks were also instrumental.

At a macro level, there are definitely things from the twentieth-century football crisis that can be applied to the modern one. These changes include new advancements in player safety, a

radical approach to change, new technologies, and new rules. All are important to helping the cause and in need of deeper examination.

The first change that can be examined is new technologies. At the forefront of the hope for helping the concussion and CTE problem is helmets that can prevent both of these things. However, the fundamental problem with concussions and hits to the brain is our own human biology. The reality that the brain, which is a soft, gelatinous and very sensitive organ sits inside of a very hard case (our skull) is an issue. As mentioned earlier, that is the whole reason concussions occur, because our brain smacks against the skull and twists violently during rapid deceleration that occurs while playing football. If we could alter our biology, that would be great. Unfortunately, that is impossible. No helmet can currently stop this phenomenon, but people are trying to fix that. A Seattle based startup called VICIS has been at the forefront of helmet technology. Their helmet, called the Zero1, was recently ranked by the NFL as the safest helmet on the market. It works by acting like a car bumper instead of a hard shell. The helmet gives and rebounds in an attempt to absorb impact. It has a large layer of rubber columns between the head and outside of the helmet, which hopes to mitigate linear and rotational impact forces with the ultimate goal of slowing down the brains deceleration inside the skull.²⁹ While it is not perfect, it is a step in the right direction and pushing the boundary for other companies to innovate. So is every player in the NFL wearing this helmet you might ask? Unfortunately, the answer is no. The helmet is much larger than others and often feels bulky on some player's heads. Most players say it is not as comfortable and noticeably heavier, so they have opted not to wear it. Why a player would choose to wear a smaller, slightly more comfortable but less safe helmet is beyond me. I guess in a league where you are paid millions, you must perform at your optimal capacity.

²⁹ "ZERO1 2018 Reservation." *VICIS*, shop.vicis.co/products/zero1.

Hopefully VICIS can fix this without sacrificing safety, or players just get used to the helmets. Another issue is that the league allows players to wear any helmet that is NOCSAE certified.³⁰ A league mandated helmet like VICIS would be a good step forward.

Another advancement in technology has been placing sensors in helmets to detect impacts that predict or measure concussions. The University of Texas is the first FBS school to utilize this technology in practices. Every helmet is now equipped with what they call the Riddell InSight Helmet Monitoring System. Within each helmet there are sensors that record G force, hit direction, and motion that feed back to the trainers. If a hit is hard enough, the trainers are immediately informed and will assess the player. The system also helps gather information to predict patterns and possible early concussion detection.³¹

Sensors in helmets are not new, and can help tackle another head injury problem in football, sub-concussive hits to the head. As mentioned earlier, sub-concussive hits are hits to the head that fall below the concussion threshold, meaning that the brain is shaken but not violently enough to cause a concussion or traumatic brain injury. With that being said, it is believed that thousands of sub-concussive hits lead to complications later in life, and are viewed as a cause of CTE. The issue with sub-concussive hits is that they are much harder to detect. Often players show no symptoms or side effects. Sensors and accelerometers are attempting to address this issue, as sub-concussive hits still destroy neurons in the brain. By forcing players to wear accelerators in their helmets, researchers are able to gather thousands of data points a game. From a broad, epidemiological basis these forces could realistically be measured. Riddell, the

³⁰ Kapadia, Sheil. "Fashion over Function: A Safer Helmet Battles the 'Cool' Factor." *ESPN*, ESPN Internet Ventures, 9 Sept. 2017, www.espn.com/blog/nflnation/post/_/id/247179/fashion-over-function-a-safer-helmet-battles-the-cool-factor.

³¹ "Texas Football Cutting-Edge Helmet Technology [May 10, 2017]." *YouTube*, University of Texas, 10 May 2017, www.youtube.com/watch?v=ant9RqTCRVA.

helmet maker, began testing accelerometer technology in helmets across youth and high school practices. It did not widely catch on in the NFL. In 2013, two unnamed NFL franchises actually participated in a voluntary pilot program of in-helmet accelerometer technology. The program collected more than 11,000 impacts. Imagine what kind of data researchers could attain from having this technology in the helmets of all 32 NFL teams. Unfortunately (and in an interesting move), the league suspended the program because they claimed the sensors could not deliver reliable data. There was still one good thing that came out of this so-called “unreliable” data, however. The researchers presented their data to the NFL, which showed that kickoff returns were the plays with the highest risk of impact. The presentation compelled the league to move the kickoff line five yards forward, to the 35-yard line instead of the 30-yard line. The goal was to shorten the running start afforded to defensive players, and it worked. Touchbacks increased by 50%. So one might wonder, why is this technology not in all helmets? Well, for the NFL the issue actually comes down to the players. Players are afraid that this massive amount of data collected can impact contract talks, especially if the data is not anonymous. The data could potential highlight high-risk players, or players more sensitive to hits or injuries. Researchers ensure that all data would remain confidential, but nothing will happen until the NFL gives the sensors their blessing. Accelerometers do, however, provide hope. An extensive and robust data set, collected over years of play, hits, and tackles, could begin to uncover the specifically dangerous plays, the degrees of force, or tackling styles in need of improvement. Similar to the kickoff line rule change, this data could help make the game safer.³²

Like VICIS, other technological advancements have attempted to address the problem of our own biological evolution. Luke Kuechly, the star linebacker for the Carolina Panthers, has

³² Bien-Kahn, Joseph. “Accelerometers Could Finally Fix the NFL's Concussion Crisis.” *Wired*, Conde Nast, 3 June 2017, www.wired.com/2017/02/nfl-concussions-accelerometer/.

begun wearing a device called the Q-Collar this year. The collar was invented five years ago by Dr. David Smith and developed with a sports science company called Q-30 innovations. The Q-Collar is a horseshoe shaped piece of plastic that fits around the back of one's head. It puts a small amount of pressure on the jugular vein, kind of like clamping a hose. The idea is to slow the outflow of cerebrospinal fluid from your brain so that more stays in your skull and fills up more empty space. The hope is that additional fluid prevents what researchers call a "slosh," i.e. the brain smashing against the inside of your skull, and prevent both major and minor trauma to the brain. The device was inspired by woodpeckers, who beat their heads against tree trunks several thousand times a day without suffering brain damage. They do this by using their tongues to put pressure on their jugular veins. Although Kuechly is the only NFL player wearing the collar, testing has begun on high school students with surprising results. A group of 42 high school players wore the Q-Collar and were tested in the preseason and in the postseason. Another group did not wear them and acted as the control. The researchers found that both groups sustained roughly the same amount of hits, but there were significant changes in the brain structure and function of the players who did wear the collar. While the device is still in the research phase, it also offers an interesting progression in battling our own physiological limitations.³³

Improving technology is just one piece of solving the head injury problem. Another important one is legislation within the sport, and more importantly fixing the concussion protocol. Football at the collegiate level, especially among athletic powerhouses like Texas, Ohio State, Alabama, Michigan, and Florida is a profitable business. The athletic programs at these

³³ Rodrigue, Jourdan. "Hard-to-See Experimental Device Luke Kuechly Wears on Field Might Save His Brain." *Charlotteobserver*, 9 Sept. 2017, www.charlotteobserver.com/sports/nfl/carolina-panthers/article172064837.html?curator=SportsREDEF.

schools generate hundreds of millions of dollars per year in revenue, with a significant percentage coming solely from football. For these schools, the football players are their biggest assets. Winning football teams generate not only millions of dollars, but national acclaim, prestige, and an influx of applications to the schools. When key players are injured it can be a devastating blow. Other acute injuries such as fractures or dislocations are both simple to diagnose and have standard therapies and recovery times. However, with brain injuries and concussions, that ability to diagnose and treat becomes more clouded and challenging. So the dilemma becomes, how do schools accurately diagnose and treat head injuries like concussions, and what protocols do they follow for their athletes?

Due to the amount of colleges and universities across the country, a uniform concussion protocol has yet to come to fruition. It was not until 2010 that legislation was officially passed by the NCAA forcing schools to create concussion guidelines. Currently, the NCAA offers a guideline for concussion diagnosis, treatment, and best practices for its members. These include the need for concussion tests, the need for medical doctors on the sideline, rules for when players can return to activity, and when players can resume academic activity.³⁴ The issue, however, is that schools are often left to their own judgment on many specific aspects for handling concussions. In January 2015, the Power 5 Division 1 conferences, which include the Atlantic Coast, Big Ten, Big 12, Pac-12, and Southeastern Conferences came together to exercise some of their autonomy from the NCAA regarding the well-being of their student-athletes, and passed the concussion safety protocol legislation. Led by the Big 12, many schools in the conferences believed the NCAA's protocols were not nearly as detailed, extensive, or protective of athletes.

³⁴ "Concussion Diagnosis and Management Best Practices." *NCAA.org*, 21 Sept. 2017, www.ncaa.org/sport-science-institute/concussion-management-and-diagnosis-best-practices.

As a part of the new legislation, all schools are required to submit a concussion safety protocol to the new Concussion Safety Protocol Committee for review and approval. While promising, there are still issues that needed to be solved. Two of these issues that have drawn the most outspoken critics are the need for strict punishment for schools that violate concussion protocol, as well as allocating more power to medical personnel and training staff in determining athletes' health. Although they supported the new legislation, conferences such as the Big 12 still believe there can be more stringent and detailed rules to better protect players and punish violators.

At the 2016 meeting, the Big 12 concussion committee again passed more promising legislation offering hope for change. This legislation ensures that the school's medical officials, not the coaching staff, have the final say on when student-athletes with concussions or other head injuries can resume playing. The importance of this legislation is that it takes the power to make medical decisions away from those most likely to abuse it, including coaches, players, and team doctors.³⁵ It mandates that a coach no longer holds the ability to make hiring and firing decisions over trainers. This rule is significant, for it attempts to mitigate the apparent conflict of interest that exists between coaches and the training staff. While the training staff is there to ensure player health, some have complained that coaches have exerted undue pressure on the medical staff to clear a player before they are ready to return to the field of play. Concerns, however, are still present for widespread legislation that was not passed, predominantly penalties for schools that violate return-to-play concussion guidelines. While penalties seem like a positive move, schools against this legislation believe that the need for additional penalties only complicates the already extensive guidelines schools must follow as a part of the NCAA. These schools also see

³⁵ Olson, Max. "Power 5 Passes Concussion Legislation, Resolution on Time Demands." *ESPN*, ESPN Internet Ventures, 15 Jan. 2016, www.espn.com/college-football/story/_/id/14576964/power-5-conferences-give-final-say-concussions-team-medical-officials.

penalties as an unnecessary additional step, as schools should have a moral and ethical obligation to protect their athletes. Unfortunately, this does not always seem to be the case. A study performed by the Chronicle of Higher Education in 2013 found that approximately half of the trainers surveyed in major college football programs said they have felt pressure from coaches to return concussed players to the field before being medically prepared. Similarly, a 2010 survey conducted by the NCAA (revealed during ongoing litigation) found that almost half of responding universities said they had returned athletes in the same game after a concussion diagnosis.

While certain conferences and universities are hesitant to enforce penalties and stringent rules for concussion protocol, there are a few schools and conferences that have been outspoken in their support for player health and have exceeded requirements set forth by the NCAA. Prior to 2016, the Big 12 had already instituted a policy to ensure that coaches did not have power in dealing with concussions. Several Big 12 representatives argued at the 2015 concussion conference that the new rules needed to be more stringent and wide reaching. The Big 12's new concussion policy, instituted at the beginning of the 2015 season, went beyond what was approved by the Power 5 and required that all member schools follow the 2014 NCAA Inter-Association Consensus Guidelines for Concussion Diagnosis and Management. Those schools found in violation of the rules would be subject to punishment by the Big 12. The Big 12 also noted that they would be requiring all schools to undergo additional education on concussions. Similarly, in December of 2014, the Big Ten announced that it would discipline those schools found to be non-compliant with concussion protocol.³⁶

³⁶ Solomon, Jon. "Why the NCAA Won't Adopt Concussion Penalties -- at Least Not Yet." *CBSSports.com*, 28 Aug. 2015, www.cbssports.com/college-football/news/why-the-ncaa-wont-adopt-concussion-penalties---at-least-not-yet/.

Although no longer football powerhouses like their predecessors before them, the Ivy League has attempted to remain at the forefront of protecting student-athletes. In 2011, the Ivy League instituted some of the most stringent restrictions on full contact practice in the spring and preseason. This year, they extended limitations, unanimously approving the elimination of full-contact hitting in practice during the regular season. While revolutionary among collegiate conferences, the move to prohibit full-contact practice was actually inspired by Dartmouth University. In 2010, Dartmouth's coach Buddy Teevens outlawed full contact in practices throughout the year, hoping to prevent body and brain injury among his players. Instead of player contact, Dartmouth players tackle pads and dummies, even developing specially designed padded robots that behave like real football players on the field.³⁷ In my opinion, more schools should be forced to adopt restrictions on the amount of full contact practices each year. The real danger in playing years of football is not years of games because there is only 12-16 in a year. The real danger is in the practices. You practice football every day, and in the summer, twice a day. Full contact practices are an attempt to simulate a game-like environment, but it might be doing more harm than good. Think about the velocity of some of these hits, and the one-on-one drills players are forced to go through. I had a number of friends in high school that played wide receiver, and used to describe particularly harrowing drills. The coaches would force the receivers to run in-routes, meaning a route in which they would run a few yards forward and then cut to the inside of the field. What this does is essentially open up the receivers to vicious hits from defenders. The inside or middle linebackers can gain momentum and hit players as hard as they can, often attempting to force a receiver to drop a ball. These plays are some of the most

³⁷ Belson, Ken. "Ivy League Moves to Eliminate Tackling at Football Practices." *The New York Times*, The New York Times, 1 Mar. 2016, www.nytimes.com/2016/03/02/sports/ncaafotball/ivy-league-moves-to-eliminate-tackling-at-practices.html.

brutal in football, but coaches want the receivers to practice catching these balls because it happens in a game while simultaneously giving the linebackers a chance to practice tackling. I had multiple friends tell me they blacked out from this kind of drill. One of my classmates even quit the team because of them. If you can mandate coaches in the NCAA and high schools to abide by universal restrictions on full contact practice, it might limit unnecessary sub-concussive and concussive hits. Additionally, intelligent tackling robots (like they use at Dartmouth) can limit the helmet-to-helmet and dangerous hits.³⁸

There are substantial issues with the college concussion protocol, and there's no quick fix. One way that appears possible is to force every school in the FBS to adopt the NFL protocol, which although not perfect, is much better. Each NFL team is required to have both a team trainer and Unaffiliated Neurotrauma Consultant (UNC) perform a focused neurological examination on a potentially concussed player. They also have two medical spotters with binoculars who watch games from the booth and are able to stop the game to tend to a player. Players who appear to even remotely suffer a potential concussion are to be removed immediately from the field and then given the tests on the sideline. These tests include Immediate Post-Concussion Assessment Cognitive Testing (IMPACT), which is supposed to judge a player based on their baseline tests given at the beginning of the season. While good in theory, it has been revealed that some players (NFL, college, and high school included) will lie on their initial exams to push the baseline past where it should realistically be. Players diagnosed with a concussion are to be removed from the field and not to enter the game again. If the player passes the exam, he is to be monitored for symptoms throughout the game. Trainers and team

³⁸ Schmidle, Nicholas. "Can Technology Make Football Safer?" *The New Yorker*, The New Yorker, 16 July 2017, www.newyorker.com/magazine/2017/01/09/can-technology-make-football-safer.

personnel are conditioned to look for any observable sign of concussion, including clutching of the head, disorientation, blank expression, or confusion. If a sign is noticed, then the protocol goes into effect. There is also a return to play protocol that has a five-step process for returning to the field of play. In theory, the protocol is in-depth and specific, but there are limitations. As mentioned earlier, some players who exhibit telltale characteristics (like Jacoby Brissett clutching his head) will pass the baseline tests and re-enter the game, only to show symptoms later. A compounding issue is that concussion tests aren't perfect. Someone can have a concussion but not exhibit symptoms. The time immediately after a concussion is the most dangerous because second-impact concussions are deadly. Finding a definitive concussion test is critical.

One thing all colleges must do, and high schools as well, is institute something like UNC's that are now a part of the NFL game. As mentioned above, conflicts of interest still exist in the game. Having these unaffiliated doctors that are free of potential conflicts of interest be in charge of players significantly improves their safety. In my opinion, the best way to eliminate the risks of conflict of interests arising from the medical staff and team relationship is for the NCAA to appoint independent medical personnel to each team responsible solely for the neurological well-being of the players. This physician should have complete control over the player's concussion testing and treatment, as well as setting the timetables for players to return to organized activity. This way, the professional responsible for the neurological safety of the players has no affinity to the school or its performance on the field. Another important aspect for supporting mental health issues in college football is by raising awareness and educating players on the dangers of sub-concussive hits to the head, and improving the number of self-reported brain trauma cases and concussions. A common and troubling theme among football players at

all levels is the desire to remain available to play and competing for the team at all costs. Often, players will fail to report symptoms of concussion or attempt to deceive team doctors during concussion testing. This can both increase risk and directly contribute to long-term neurological problems due to the fact that the most dangerous time for the brain is the time period directly following a concussion. Formally educating players on these risks can hopefully improve the number of self-reported concussion symptoms and emphasize that their long-term health trumps the short-term gains of the team.

At the end of the day, doctors diagnosing players is only half the battle. Players themselves have to be willing and vigilant in protecting their own brains. Advocacy for player health and educating football players is important to save their brains. But conflicts also arise for most players, especially players who are fighting for a roster spot, not a superstar, or want their chance. At a collegiate level, players want to stay in the game as long as possible. Some are fighting to make the team; others are fighting to make the NFL. It is the same deal for high school players. Even NFL players who are on the practice squad or fighting for a role will lie about their health to remain in games. Others feel a sense of brotherhood or loyalty to their teammates to stay in games at all costs. A recent ESPN poll of 92 college players found that 33 percent have lied about concussions to remain in play.³⁹ Educating players so that they are vigilant and can recognize symptoms is vital. Self-diagnosis is critical to player health. At the end of the day, they must understand that they are in control of their well-being. You only get one brain.

³⁹Muma, Steven. "Lots of Players Lie about Concussions, Poll Finds." *SBNation.com*, SBNation.com, 8 Aug. 2013, www.sbnation.com/college-football/2013/8/8/4601624/college-football-concussions.

On this topic of health advocacy, and educating coaches and players, there should be a new focus on the youth game. First, there should be a new established age minimum for playing tackle football in the US, which I believe should be 8th grade. In 2013, the *Annals of Biomedical Engineering* published a study indicating that the head impacts sustained by players aged nine to twelve could be as severe as those sustained by college players.⁴⁰ By the 8th grade, most middle school students have gone through puberty and do not have a significant weight advantage. This also takes off a few years of potential concussive hits. Think about players who make it to college. At a minimum, they have played football for 4-8 years, with most having played a decade. For those that make it to the NFL, that number is ten or more years. We know that long term, repeated hits to head cause CTE. Maybe, this can be the first step in curbing the disease.

Another equally important step is to educate the players and coaches at the youngest level of the game. Middle school and high school coaches should be forced to undergo extensive concussion training to not only help diagnose players and recognize symptoms, but to understand the danger of concussions and potential traumatic brain injury. Students at this level are young and are just as susceptible to concussions and high-speed impacts. Emphasizing for all students how important protecting one's brain is, as well as the risks of playing with undiagnosed concussions or symptoms, is vital. We must help all parties involved in youth sports understand symptoms and be vigilant in protecting athletes. In addition, I believe there to be a systematic failing in coaching across the country. The issue is that are thousands of youth, high school, and college coaches that can be difficult to monitor. Most coaches are taught to emphasize toughness, manliness, brutality, and winning at all costs. Grabbing facemasks, screaming at players, punishing weakness; these are all fundamental failings but existing realities in coaching that

⁴⁰ See New Yorker article

breed the mental health issues plaguing the sport. It leads to players lying on their baseline tests, hiding concussion symptoms from doctors, entering the field of play when they are not ready, and trying to hit the opposing players as hard as humanly possible. When you are taught for a decade to do all of these things, it becomes ingrained in your memory. Players know no other version of football. At some point, enough is enough. There is a trickle down effect in football. If you can start with creating better, more aware and empathetic NFL coaches, you might just be able to fix the rest of the system.

For the fight against concussions and CTE, scientists, players, innovators, and doctors must constantly attempt to push the boundaries of diagnosis and treatment. In labs, research facilities, football fields, and schools across the country there are people hoping to find an answer. The good news is that every day we move one step closer. In November 2017 researchers published a medical breakthrough in the journal *Neurosurgery*. Researchers at UCLA (with the assistance of Bennet Omalu) believe they were able to successfully diagnose a living person with CTE. In 2012 researchers scanned the brains of 14 living but retired NFL players. They developed a new diagnostic exam that uses a radioactive tracer called FDDNP to bind to tau proteins in the brain. The proteins can then be seen on a PET scan. 1 of the 14 players studied, named Fred McNeill, had what researchers believed to be CTE from looking at his brain scans. It was not until 2015 however when McNeill died that researchers confirmed he did in fact have CTE. The team hopes to continue testing their technology with the expectation of being able to predict and diagnose CTE earlier than previously thought possible.⁴¹

⁴¹ Kounang, Nadia. "Ex-NFL Player Confirmed as 1st Case of CTE in Living Patient." *CNN*, Cable News Network, 16 Nov. 2017, www.cnn.com/2017/11/16/health/cte-confirmed-in-first-living-person-bn/index.html.

These are all just hopes for the future. The many problems that underlie the modern day football crisis cannot be fixed immediately. It will take years of work, research, trial and error, and policy changes to make considerable reforms in favor of player health. Often times it appears as though real change is slow and never truly comes to fruition. It is hard to change the way things have always been. At the end of the day, football programs from college to high school follow the NFL's lead. It is paramount that the NFL be consistently at the forefront of concussion prevention, protection, diagnosis, and treatment. Although for years they attempted to hide the link between football and CTE, they have (at least on the surface) appeared to reverse this course. For the league, money will always be the driver for decision-making. For fans of the game, and especially sponsors, holding the NFL to a high standard is paramount in the fight against the modern football crisis.

Chapter 5: Football's Importance to American Society

What's so good about football? What is the point of keeping it around? Why do we condone people to play a game we know can lead to serious health problems later in life? I started asking myself these questions as I began writing this paper. There are many issues with football, there is no question about it, but there are also so many great things about the game and why it has endured. It is important to understand why the game needs to stay and its value to American society.

The ancient Roman poet Juvenal, who lived in the first and second century AD, coined the term "bread and circuses" to describe a state sponsored plan of free food and entertainment. The idea was first put forth by Augustus and continued under the rule of other emperors. In times of struggle, the idea of bread and circus was to keep the people happy, and distracted from societal and economic problems of the empire. The emperor would give out free grain and bread, and often hold free chariot and gladiatorial matches in the coliseum.⁴² Today, people often liken large sporting events including football to the circuses of antiquity, as a means of distracting society from larger socioeconomic problems. However, I disagree with those beliefs. What I do believe is that football is our modern day circus, and a good distraction, not a bad one. Football is everything gladiatorial and chariot races were. It is quick, violent, and brutal. While some gladiators used their strength and speed to win fights, others used technical skill and finesse to win, just like in football. Yes, football games exist to serve as a distraction, but not to take advantage of the people, to serve as a distraction to bring people together. Football games aren't free to attend. People spend money to go to games because they are incredibly fun to watch. They are an entertaining escape for a few hours from normal life and a unifying experience for

⁴² "Plebeians." *PBS*, Public Broadcasting Service, 2006, www.pbs.org/empires/romans/empire/plebians.html.

all. They bring together generations of family members and friends from across the country.

Anyone who has been to a professional or college game can tell you the bonding experience of rooting for your favorite teams. Having nearly 100,000 people celebrate together is a phenomenal experience.

Not just for spectators is football unifying, but for the players as well. Football is a sport that brings people together from all walks of life. It instills in young men a solid work ethic, teamwork, and discipline. It is an escape for kids from the poorest and wealthiest neighborhoods in America, where at practice every day, or games on the weekend they can forget about any problems troubling them at home. You hear often from players in the NFL and college as to why they play, for some it was a love for the game, for other it was their therapy. Sometimes, football is the only escape for poor and destitute young men across the country. For them, it is an outlet, a way to escape the burden of a troubled home life. Unlike more affluent children who can simply pick up a different sport, poorer children cannot do that. For many of these young men, football is their only chance to escape a life of poverty and crime. It's their one and only chance. Is it really fair to take this away from them?

For all players, especially young ones, football has many important health benefits. On top of being an enjoyable and fun activity, it promotes cardiovascular health and overall well-being. Like other team sports, regular intense activity and training helps instill in young players the importance of exercise and maintaining a healthy lifestyle. America already suffers from a youth obesity crisis, and eliminating a team sport like football played by millions of young children will only make the crisis worse.

Economically, losing a game like football would be disastrous. Each year the sport generates billions of dollars in revenue and economic benefits to cities around the world. The

only football specific economic analysis I could find was from 2011 (an updated one could be a good future thesis!) and although a little dated still provides the same idea of the quantity of money generated by the NFL. The league itself supports 110,000 jobs in NFL cities, including hotel and bar workers, concessions stand employees, and team personnel. During the 2011 regular season alone, the NFL generated \$9.5 billion in revenue. It is predicted that NFL games add about \$5 billion to the economies of NFL cities across the country. Advertising sponsorships generate additional billions of dollars every year. The lowly Cleveland Browns, one of the worst teams in professional sports, generate \$63 million a year for Cleveland businesses.⁴³ One can only assume what this number is for the best teams like New England and New York. This benefit is also not solely domestic. In 2016 the NFL played one game in Mexico City, and Ernst & Young estimates it produced an incremental increase in the city's GDP of \$45 million, supporting 2,840 jobs for the city.⁴⁴

College football over the years has also become big business. The top football programs across the country regularly bring in \$100 million or more in revenue a year, not to mention the economic impact for each city that hosting football games brings every weekend. In 2015, researchers at San Diego State University found that the 41 college football bowl games that year generated a combined \$1.5 billion of economic impact for host cities.⁴⁵ Losing football would mean losing tens of billions of dollars of economic value for cities across the world.

⁴³ Wiseman, Paul. "Football's Back: NFL Is a Key Player in the Economy." *USA Today*, Gannett Satellite Information Network, 11 Sept. 2011, usatoday30.usatoday.com/money/economy/story/2011-09-11/nfl-economy/50339734/1.

⁴⁴ Mckee, John. "2016 NFL Mexico Game Generates Economic Impact of \$45M and PR Value \$250M." *American Football International*, 24 Feb. 2017, www.americanfootballinternational.com/2016-nfl-mexico-game-generates-economic-impact-us45-million-pr-value-us250-million/.

⁴⁵ "The Economic Impact of College Football Bowl Games." *NewsCenter | SDSU*, 9 Dec. 2016, newscenter.sdsu.edu/sdsu_newscenter/news_story.aspx?sid=76492.

People around the world often call soccer the beautiful game, but I think it has nothing on football, the true beautiful game. Football is equal parts strength, skill, finesse, and speed. It is like a game of chess but with real people as the pieces. It is inherently American, exemplifying who we are as a country and mirroring that which we strive to be. Football's growth parallels the growth of America as a world power. Football started to find its footing in society just as America started to find its place in the world. Although Theodore Roosevelt saw the dangers of football, to him the benefits outweighed the costs. He believed it cultivated strong young men, capable of thinking on their feet and working as a team. As mentioned earlier, Roosevelt saw the fight for American progression in the survival of football. It was, and is, who we are as Americans. Powerful yet capable, strong but calculated. Then as much as now football is a societal and cultural cornerstone of American society. It is ingrained in our history and our DNA. It is not just what football brings to making well-rounded individuals that is important, but what it brings to American society. It's a unifying experience for family and friends, for generations young and old. By losing football, we would lose part of what makes us American. Would Sunday in America even be Sunday anymore without football?

Conclusion

It is a critical time for the game of football. For many fans of the sport, it may appear that all is well, and from a superficial viewpoint that is correct. The NFL and college football have never been more profitable, millions of children across the country play the game, and it's on TV every Thursday, Saturday, and Sunday. But when you dig a little bit deeper, when you start to peel the layers off of this giant onion, things begin to look slightly rotten.

The idea that humans are not made to play football is something that has bothered me for a long time. As a fan of the game I now cringe at big hits, because I know too much. I know the sacrifice these players are making to be on the field. I know that for every crack of the helmet, every head hitting the turf, every snap of the ball, there is a high likelihood someone on that field is suffering a head injury. While it may not be a concussion, it is sub-concussive hits built up over a lifetime of the playing football. In players, the health problems will not arise for a while. Most are undetectable for decades, but they will come. First it will be the mood swings, and the rage, impulsivity, and depression. They might forget their keys somewhere, or be confused as to where they are. Memory loss sets in, and they start to change. Brothers, fathers, sons; strong men who were always caring and patient suddenly become a shell of their former selves. Over time dementia, Alzheimer's, Parkinson's, and even ALS set in. Decades before they are supposed to, they are dead, having suffered for the last few years of their lives, a byproduct of playing the game they loved. "Was it worth it?" their families will ask? "Was it worth the fame or the millions of dollars?" "Can we change this so no other family has to suffer the same way we did?"

The answer to that is yes (I hope). I am an optimist that believes we can alleviate the head injury problem in football. I do not know if we will ever completely solve the problem, but we can take steps to mitigate the risks of playing football. The advancements in technology and

research progress every day. We are just at the beginning of a technological revolution in sport, one that will create safer methods of play and accurate treatment and identification of head injuries. The public and scientific community is no longer complacent in allowing big business (mainly the NFL or power universities) to take advantage of their players, or allow them to continue playing when they are unable. Social media has revolutionized accountability and player advocacy for the better, and this trend will hopefully continue. The future is looking bright.

Although not addressed in the body of this paper but worthy of discussion are lawsuits and legal rulings that are poised to revolutionize both college football and the NFL, and maybe even the high school game. In 2009, after the NFL finally acknowledged the effects of head trauma and concussion, lawsuits from former players began. Eventually, all of these lawsuits were combined to form a giant class action lawsuit by 20,000 former players brought against the NFL seeking monetary damages for players from health issues caused by years of playing in the NFL. In 2016, after years of legal proceedings and appeals, a panel of judges on the U.S. Court of Appeals for the Third Circuit approved the terms of the settlement. The settlement calls for varying levels of compensation for retired players, which depends on their age, injuries, and NFL experience. It is expected that, on average, each player will receive \$190,000, but up to \$5 million. Over 65 years, the NFL is expected to pay out \$1 billion, or \$15.4 million a year. In reality, the settlement is a small victory for the players, and a large victory for the NFL. For some former players in need of money and medical assistance, the payout will provide needed funds for treatment and care. From the NFL's standpoint, they leave the case with almost no repercussions. They will have to pay a measly 7% of one year's revenue (in 2015 it was \$14 billion), and do not have to admit any guilt. This is important, as they have eliminated almost all

of their exposure to liability for concussions. By settling here and not admitting guilt, they have utilized a legal principle called *Res judicata* which means once a claim has been resolved, it cannot be re-litigated. Although an overall disappointing settlement for players, this is not the end. A few hundred former players opted out of the lawsuit, so they still have the potential to sue the NFL. The lawsuit only covers retired NFL players as of 2014, so current and former NFL players can still sue the league. A big point of emphasis is also CTE and its diagnoses. One of the ways the NFL has been able to shed blame is the fact that no conclusive facts can prove that the NFL caused the neurological problems of its former players. NFL players played many years of youth football and received thousands of hits before stepping foot on an NFL field. It is also possible that these players simply suffered bad luck or bad genes. However, the link between CTE and playing in the NFL cannot be ignored. Once CTE can be accurately diagnosed in living people, and if it is proven that playing in the NFL causes CTE and other neurological diseases, a new wave of lawsuit will arise.⁴⁶

Universities across the country and the NCAA are facing their own legal problems stemming from concussions. In July 2016 a federal judge granted preliminary approval for a \$75 million settlement of a class action concussion case against the NCAA. The money is to be used for medical monitoring for college athletes, as well as new research and treatment programs for concussions. It also includes provisions for new return to play guidelines, and training for players and faculty members. The case covers both contact and non-contact athletes across all NCAA sports. It is a step in the right direction, but might do little for the NCAA. In a recent appeal, a court ruled that the NCAA does in fact have a duty to care for its athletes, not just the schools themselves. Fundamentally, this could change the entire settlement. On top of that, players who

⁴⁶ McCann, Michael. "What's next after NFL's Concussion Settlement." *SI.com*, 18 Apr. 2016, www.si.com/nfl/2016/04/18/nfl-concussion-lawsuit-settlement-retired-players.

opted out of the lawsuit can still sue the NCAA.⁴⁷ The biggest challenge might come for the schools, who are the ones truly responsible for the health of their players. I am genuinely worried for some of the large universities across the country because of the possibility of massive impending lawsuits. The reality, and what will most likely be argued in court, is “were the players afforded reasonable care from their universities?” Things are different now, but in the past there was little emphasis on concussions or player brain health. Former players can argue that schools did little to protect and treat them after suffering concussions. Most were not made aware of the risks of playing football and if (like in the case of the NFL) can prove that playing college football caused long term health issues, might be poised for a massive settlement.

Additionally, high schools might face the risk of concussion lawsuits stemming from former players. While the threat is less likely, it is still possible that players can attempt to prove that high schools failed to accurately protect their brains, especially players who stopped playing after high school but suffer from brain injury or brain disease later in life. While research in this sub-group of players is minimal, it has still shown that playing high school football has a profound effect on brain chemistry and structure.

Beyond a legal assault of the sport, there is also an ethical one. Something often cited during the twentieth-century crisis (and again now) is whether it is ethical for colleges and high schools to condone football. For universities of higher learning that pride themselves on education and development of young people, how can they condone a sport that is bad for one’s brain?

⁴⁷ Keating, Peter. “Legal Ruling Adds Intrigue to NCAA Concussion Settlement.” *ESPN*, ESPN Internet Ventures, 23 Nov. 2017, www.espn.com/espn/otl/story/_/id/21518800/legal-ruling-involving-women-lacrosse-adds-intrigue-ncaa-concussion-settlement.

Head injuries, concussions, CTE, and mild traumatic brain injuries are the poster child for the main problem with football, but it is also not the only one. Football has an image problem across the spectrum, from high school up through the NFL, and I am not sure that anyone can solve it. The image problem does not stem solely from concussions, but protests in the NFL over the national anthem, discipline and sexual assault among players, and compensation for student athletes. Among many of the problems discussed, finding some way to pay college players could alleviate some of the lawsuit risk.

Over the last year, NFL viewership has decreased. During the 2017 season, viewership has been down 6.3 percent.⁴⁸ Some of this can be blamed on the protests over the national anthem and current political climate, but some viewers are also concerned about condoning concussions and brutal play. Youth football participation is also declining. According to the Sports and Fitness Industry Association (SFIA) the number of boys aged 6-17 playing tackle football fell 18 percent from 2009-2014, and an additional 2.5 percent in the 2016-2017 season compared to the one prior. Parents of youth football players are genuinely concerned for the health of their children. Years before the concussion crisis grabbed national headlines, my own parents barred me from playing football citing long-term health concerns. I was of course devastated, but to me it made sense. Parents are forcing their children to pick up other sports, one's without as much risk as tackle football. Without youth participation, football could be heading for a crisis of player development.

While all of these things might paint a bleak picture of the future of football, it will be around for many more years and hopefully can adapt to survive. There are so many great reasons for football to exist ranging from health benefits to economic importance. By confronting these

⁴⁸ Morgan, Richard. "The NFL Ratings Slump Is Getting Worse." *New York Post*, New York Post, 22 Nov. 2017, nypost.com/2017/11/22/the-nfl-ratings-slump-is-getting-worse/.

things now and head on, there is hope that change can come. The importance of education, advocacy, and health can be emphasized while allowing football to grow and thrive. One is not mutually exclusive from the other. I have hope that it will survive so that fifty years from now, on a cool fall day, I can sit with my grandchildren and together watch the game I love.

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BIOGRAPHY

Robert I. Benedikt came into this world on March 22, 1995 in Silver Spring, Maryland. Mr. Benedikt moved with his family a short time later to San Antonio, Texas where he would spend the rest of his adolescence developing an affinity for the San Antonio Spurs and a yearning for interdisciplinary enlightenment. He enrolled in the Plan II Honors program at the University of Texas in 2013 and studied international delinquency his junior year at ESCP in Paris. In college, Robert pursued a number of extra curricular endeavors, including joining the Zeta Beta Tau fraternity and serving multiple leadership roles in his student-run stock portfolio. He graduated in 2017 with a Bachelor of Business Administration and a Bachelor of Arts, and plans to begin his real estate empire in Dallas in early 2018.