

Conservatism in Sport: Opposition to Safety
Regulations in Professional American Football

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As American football and the National Football League established themselves in American professional sport through the 20th century, high injury rates caused controversy. Player injuries have been common since American football diverged from its brother sports rugby and soccer in the early 20th century, and collegiate athletics doctors immediately took note of the frequency and severity of impact injuries (Harrison, 2014). At the same time, industrialization in the United States brought about workplace safety regulations, and improving medical technology meant better quantification of professional safety concerns. While these trends continued through the 20th century, issues of player safety in American football were dwarfed in comparison to the rapid growth in viewership and support of the National Football League (NFL) (Krasnow & Levy, 1962).

Public outcry reached a notable peak in the early 21st century as several studies related repeated concussions to permanent brain damage (Guskiewicz et al., 2007). These studies also brought awareness to Chronic Traumatic Encephalopathy, a disease first described in the 1920's in boxers, but little researched until 2005 (Concussion Legacy Foundation, 2015; B. I. Omalu et al., 2005). In response to the growing public concern for its players, the NFL has instituted a series of rule changes and protocols to prevent concussion and promote player safety (*Approved 2018 Playing Rules*, 2018).

The recent rule changes by the NFL, such as the prohibition of initiating a tackle with the helmet, alter how American football is played and ultimately enjoyed by its viewers. This has created a rift between spectators, dividing those who hold the safety of players as paramount, and those who hold highest the tradition and values of the game as it was originally conceived.

Advocates of regulation believe in an ever-adapting sport, in which athleticism and strategy will persist (Foley, 2018). Critics of this viewpoint see changes as defiling a game long held sacred for its principle requirements of toughness and resiliency (Guarnio, 2016; Pesca, 2018). To many, the danger and violence are part of the game; hundreds of videos entitled “Hardest Hits” receive millions of views online (*Biggest Football Hits Ever*, 2015). In making changes for player safety, critics believe the core appeal of the game is lost.

As viewers debate, the NFL struggles to retain support from both sides. After fighting for decades to become America’s most popular and by far most profitable sports league, viewership is the primary interest of the organization. The number of people watching NFL events determines the value of broadcasting rights, its largest revenue source (Burns, 2016). For this reason, the NFL strives to appease both sides of the rule changes argument. As the NFL straddles the fence, slowly adapting rules while trying to maintain the image of “real” football, the National Football Players League Association (NFLPA) is pushing independently for the side of player safety.

The NFLPA is a union that represents the interests of NFL players, including player safety. According to its mission statement, the NFLPA values the rights of the player, and seeks to “preserve and enhance the democratic involvement of its members” in NFL proceedings. In accordance with that mission, the organization claims to have “dedicated millions” of dollars to create the Football Players Health Study at Harvard University (Johnson, 2016). The NFLPA negotiates with the NFL on matters of player safety, can appoint two members of the NFL Competition Committee, which determines all rules changes, and can change rules believed to impact player safety through the Joint Committee for Player Safety and Welfare Arbitration (Deubert et al., n.d.). Through these two approaches, the NFLPA seeks to tip the NFL towards

the side of rule changes and increased regulation, even without having direct influence over viewership like in the case of the fans.

As controversy escalates between fans of professional American football, and between the NFL and the NFLPA, news outlets in the United States have reported extensively on the debate. News outlets ostensibly seek to inform the public on important topics and relevant news, but truly value viewership above all else. By covering controversy they can increase viewership, so news outlets have reported extensively on the rule changes and concussion protocols, often including accounts of player deaths (Carroll, 2016) or parallels to children's sports (Newman, 2019) to increase the shock value of the story. As these stories have attracted advertising value, they have also increased public awareness of the dangers of American football, which has played a role in new regulations.

As the discussion over steps to increase player safety takes place, the question of who is held responsible for the consequences of American football also comes into question. The physical consequences of American football on its players and the general public have become more evident as neurologists have linked diseases like chronic traumatic encephalopathy to behavioral changes in former NFL players (Stein et al., 2014). In the case of Aaron Hernandez, a former NFL tight end who was convicted of murder and later killed himself in prison, the family was reported as having considered suing both the NFL team and the collegiate team for which Hernandez had played (Belson, 2017). A settlement in 2016 between the NFL and thousands of families of players set the precedent of holding the NFL responsible. The NFL will now pay over one billion dollars to go towards future medical bills of players who were retired at the time of the settlement. The question remains under debate whether the NFL can continue to be held responsible for ongoing player injuries and medical costs. As one blog post points out, the

consequences of playing American football are no longer unknown, so perhaps the players deserve some responsibility for making the decision to play at all (Case Adams, 2012). A similar sentiment is offered regarding parents of players, who may have encouraged the young athletes to take up a sport known to be dangerous. The controversy over liability will be an important cofactor to consider when looking at the debate over American football regulations, as it may create the greatest pressure on the NFL to act, or may absolve them of responsibility altogether.

Changes to rules and regulations in the most popular professional sport in America have divided organizations and fans. The controversy will determine the future, and possibly the fate of professional American football.

Review of Research

Extensive research has been done over the past 50 years on the impact of football injuries, particularly concussions, on brain health as athletes progress from the field to retirement (Guskiewicz et al., 2007; Hamberger et al., 2009; B. I. Omalu et al., 2010; Pellman et al., 2006; Pietrosimone et al., 2015). This research has established a commonly accepted link between football and later in life brain diseases like CTE. This research is key for the findings in this paper as it should be clear that there is no longer doubt about the validity of concerns for the health of professional football players. The controversy at this time is related to what responsibility the NFL has in making changes to make the game safer.

Another area of relevant published work to date has noted extensively the role that technology, particularly social media, are having in empowering and organizing previously unorganized groups to bring about change (Lim, 2012; Milan, 2015; Sandoval-Almazan & Ramon Gil-Garcia, 2014). As social media have become both accessible and popularized,

greater gravity has been brought to the opinions of the average user. In the research presented here, this is especially relevant as most of the major groups involved with the debate over player safety use social media as a means of sharing ideas, raising awareness, and gathering supporters.

Direct Approaches

The NFLPA is the closest group to the rule change process in the NFL. With their members within the NFL Competition Committee, this union has direct access to and impact on the NFL regulation process. It is this direct access that has allowed the NFLPA to push forward a number of player safety measures in recent years, including rule changes like the banning of lowering the head to initiate contact, or the prohibition of the blindside block (Goodell, 2016; NFL, 2019a). By regularly meeting directly with NFL representatives, and taking part in rule change processes, the NFLPA continues to push the NFL to make player safety the paramount concern.

While the agendas of fans for and against regulation changes may oppose one another, the methods by which the two groups directly advance their agendas are very similar. Regardless of what research is published or other events outside the game of football, it is the NFL that makes decisions that impact the agendas of the fans. In order to most directly impact the NFL, fans on both sides of the argument most often move for boycotting NFL games and programming in order to make a statement (Burroughs, 2017; David, 2015).

Families of current and former NFL players also directly push the issue of player safety by suing the sports league for the costs of medical care associated with football related injuries and disease (Belson, 2019). While the first goal of these lawsuits is to compensate the players and their families, the plaintiffs of these cases also cite the cases as a method of spreading

awareness to the public, as well as sending a message to the NFL by equating the physical consequences of the sport into a dollar value (Maske, 2013).

Public Campaigns

In addition to direct approaches for advancing their agendas around NFL rules changes regarding player safety, groups on both sides of the issue have developed methods for publicly campaigning. Because the validity of concerns around player safety in American football was controversial for so long, campaigns like the “Your Mind, Your Body, Your Health” Wellness Campaign run by the NFLPA move to bring more awareness to the seriousness of the issue (Johnson, 2016; NFLPA, 2017). Because the NFLPA has such a direct influence as an advocacy group, there is less effort made into recruiting supporters and changing the minds of fans. Instead, the NFLPA encourages research and a sense of severity around the issue in order to support negotiations with the NFL.

Fans both advocating for and criticizing NFL rules changes appear to use public campaigns in a slightly different manner. As generally unorganized groups, fans tend to move to the internet and post opinion blogs as a method of encouraging discussion and recruiting like-minded individuals (Bry, 2016; Crowley, 2018). For fans, many of whom hold professional American football very close to their heart, these public campaigns are an effort to be the side with the bigger voice, hoping that the NFL will choose the side with the largest fanbase in order to maintain viewership. Where fans on each side of the debate differ is in their approach to campaigning. Fans against rule changes tend to use appeals to the masculinity of the sport to de-incentivize safety measures (Davenport, n.d.; Guarnio, 2016; Weems, 2018). Fans in favor of rule changes tend to use appeals to human empathy or fear appeals, often speaking about the

deadliest consequences of CTE in an effort to both shock and relate to the reader (Bachynski et al., 2019; Loria, 2015).

Indirect Affecters

In addition to fans and the NFLPA advancing their agendas through direct means and campaigns to raise awareness or recruit followers, there are indirect means by which groups are influencing the decisions of the NFL regarding player safety. A clear example of this is in the medical research feedback loop that has accelerated in the past few decades (Hamberger et al., 2009; Pellman et al., 2006; Pietrosimone et al., 2015; Strain et al., 2013). As public outcry over physical injury from football has increased, more researchers are drawn to the hot button topic to publish work in higher ranking journals, which then floods the field of medical research with discoveries that increase outcry from the public even more. In the process, this cycle has pushed the NFL to respond with more money publicly dedicate towards research, as well as with greater consideration for these findings when discussing rule changes (Maske, 2018; NFL, 2017). While these researchers may not have intended to take a side on whether or not a player should be allowed to initiate contact with their head, this cycle has helped to drive the agendas of the NFLPA and fans in favor of rule changes for player safety. This research cycle has also brought about a shift in the minds of parents, who may before have aspired to see their child grow up to be an NFL star, but now are wondering if they would let their child play at all (Findler, 2015; MacDonald & Myer, 2016; B. Omalu, 2015). While the participation in so called “pee wee” football leagues may not directly impact the decisions of the NFL competition, the movement of parents who refuse to allow their children to play football may start to lower participation at the high school and collegiate levels, which may eventually decrease the talent available and the

interest in general in professional football. The NFL knows this already, which is why they have for years engaged in promoting youth interest in football (Stapleton, 2019). By threatening the future of the NFL, this movement among parents is pushing the NFL to enact rules changes that make the game safer.

News outlets also play a major role in indirectly swaying the NFL around changes relevant to player safety. In order to increase their reader base and increase the value of their advertising space, news outlets have followed the most gripping and shocking events of the player safety debate. In general, news attention brings the awareness around the topic of player safety just as the NFLPA and fan public campaigns aim to do. By reporting from both extremes of the controversy, the news media is able to catch the attention of readers and spark vehement debate in comments sections. On the side of advocates for rule changes, the most eye catching and shocking stories tend to be those surrounding player deaths or medical research linking brain damage in football to criminal action (Garber-Paul, 2020; McDermott, 2017). On the other end, news outlets report interviews and discussions with public figures over whether rule changes are ruining the sport (Guarnio, 2016; Pesca, 2018). By reporting on from the furthest edges of the player safety controversy, news outlets are able to maximize readers of all opinions looking for confirmation of their own beliefs. In doing this, news media is also echoing the cries of both sides of the NFL fan base, polarizing the argument, and limiting the public view to an “all-or-nothing” scenario for protecting players, wherein either football but be banned for the good of humanity, or must remain unchanged forever. Initially, the NFL may not have been required to act in any way, but could have sat back as debates raged in comment sections and crowded bars, but by strengthening both sides of the debate and making the issue of player safety even more public, news media is pushing he NFL to choose a side and act.

Responses by the NFL

As the controversy builds around player safety in professional American football, the NFL has performed a careful balancing act of maintaining the game for more conservative fans, and expanding to accommodate for advocates of change. The NFL has been extremely successful on this front so far, averaging almost 17 million fans for each regular season game (Lafayette, 2020). While on a broad scale, the NFL continues to grow and dominate American sports culture, the growth of social media has taken away the immunity of the NFL to the opinions of fans (Evans, 2016). The NFL has offered a variety of different techniques to appease its divided fans and maintain viewership. Initially, the NFL publicly denied any link between the sport and later in life medical complications (Ezell, 2013). This strategy has toppled dramatically as research has poured into journals directly linking football to long term physical disease, and even some mental disorders. Now, by donating millions to fund additional research on the health impacts of playing professional football, the NFL is able to reassure advocates for player safety without making major changes to the game (Maske, 2018; Serhan, 2016). In addition to these more passive measures, the NFL has made numerous rule changes, particularly over the past decade, which serve to better protect players (*Approved 2018 Playing Rules*, 2018; NFL, 2019a; NFL Operations, n.d.). The NFL has also released numerous press releases regarding their commitment to player safety (NFL, 2015). In order to maintain their more conservative fans while these changes were made, the NFL has made changes and funded research in making padding and helmets more effective. These changes would keep the game from appearing any different to the viewer, but would still in theory better protect the player (NFL, 2019b). While these efforts appear to satisfy both sides of the controversy, advocates for player safety note that

no padding or helmet can completely eliminate physical trauma, and maintain that changes made to the way the game is played are the only true option. Some advocates even indicate that helmets and padding may increase the rate of injuries by encouraging players to hit harder (Cecil Adams, 2013; Connolly, 2019). By making rule changes, donating to medical and technological research, and releasing statements with intent to reassure the public, the NFL continues to try and satisfy all sides of the argument to maintain viewers and keep its advertising space relevant.

Conclusion

Medical research has established a link between physical trauma suffered by professional American football players and later health impairments (Mez et al., 2017; B. I. Omalu et al., 2005; Pellman et al., 2006). These impacts are known to range in severity, but in the worst case these conditions can be deadly. As fans, families, and players in the U.S. have learned about this link, controversy has grown over whether or not American football should change to increase player safety. Advocates for changes to the game, critics of those changes, the NFL, and less intentional groups like news media, all play a role in the evolution of the game as they seek to advance their own agendas. Advocates of increased regulation use their social media presence and appeals to fear and human empathy to bring more support on board, while critics of changes to American football often appeal to the tradition of the game and the heritage of toughness to demonize changes. As fans pull the NFL from opposite sides, the NFLPA maintains direct influence in meetings to push forward changes that protect players, and runs campaigns to increase public awareness of the issues. To continue to grow as a successful business by keeping fans and increasing advertising revenue, the NFL attempts to sit atop the fence by funding

research and changing rules without changing the look of the game. Meanwhile, the news media stirs the pot by publishing anything shocking or controversial enough to grab more readers.

In this web of forces acting on one of America's most popular sports, the forces most closely related to funding the NFL will likely win out. The NFL has no money and no business unless its advertising space is considered valuable to advertisers. The value to the advertisers is related directly to total viewership. While the NFLPA appears to have the most direct influence over rules and regulations, true changes will correspond with the agenda of the louder and more active fanbase. The threats of fans to boycott NFL events may seem idle or unorganized, but social media and news reporting have polarized and organized efforts enough that the NFL has seen its ratings and attendance impacted. This case of the NFL being forced to act by largely unorganized groups makes it clear that the technology of social media and news media is increasing the power of the public over large companies, and actions as small as participating in comment threads can play a role in enacting change to even the largest and most sacred areas of life.

References

- (35) *Biggest Football Hits Ever—YouTube*. (n.d.). www.youtube.com/watch?v=v-1MQ0Cnbhs
- Adams, Case. (2012, July 14). Who is to Blame for Brain Damage to Football Players? *Heal Naturally*. www.realnatural.org/who-is-really-to-blame-for-brain-damage-caused-to-former-nfl-players
- Adams, Cecil. (2013, Feb. 18). Do Pads and Helmets Increase Rather Than Prevent Football Injuries? *WEHOville*. www.wehoville.com/2013/02/18/do-pads-and-helmets-increase-rather-than-prevent-football-injuries
- Approved 2018 Playing Rules* (2018, March 28). operations.nfl.com/updates/the-rules/approved-2018-playing-rules
- Bachynski, K., Kearns, L., & Caplan, A. (2019, Nov. 27). Concussions, broken bones, and more: A week of U.S. football. *STAT*.
- Belson, K. (2017, Sep. 21). Aaron Hernandez Had Severe C.T.E. When He Died at Age 27. *New York Times*.
- Belson, K. (2019, Sep. 12). N.F.L. Settles Lengthy Fight with Insurance Company over Concussions. *New York Times*.
- Bry, D. (2016, Jan. 4). American football is too dangerous, and it should be abolished. *The Guardian*.
- Burns, M. (2016). NFL national television broadcast deals 2014-2022. Statista.
- Burroughs, R. (2017, Sep. 20). Seven Reasons to Boycott the NFL Besides Colin Kaepernick. *BK Reader*.
- Carroll, L. (2016, Jan. 4). *Football Player Had “Worst” Brain Trauma Seen in Someone So Young, Doctor Says*. NBC News.
- Concussion Legacy Foundation. (2015, June 15). *What is CTE?* Concussion Legacy Foundation.
- Connolly, O. (2019, Sep. 6). Helmets don’t eliminate concussions. It’s time for the NFL to ditch them. *The Guardian*.
- Crowley, J. (2018, July 19). *NFL is unwatchable now: Crowley*.

- Davenport, G. (n.d.). Is the NFL Simply Becoming Too Soft? *Bleacher Report*.
- David. (2015, Jan. 29). Comment on: Concussions in the NFL: How Worried are You? Frontline.
- Deubert, C., Cohen, I. G., & Lynch, H. (n.d.). *Protecting and Promoting the Health of NFL Players: Legal and Ethical Analysis and Recommendations*. Petrie-Flom Center for Health Law Policy, Biotechnology, and Bioethics, Harvard Law School.
- Evans, K. D. (2016, Oct. 11). NFL viewership down and study suggests it's over protests. *The Undefeated*.
- Ezell, L. (2013, Oct. 8). Timeline: The NFL's Concussion Crisis – League of Denial: The NFL's Concussion Crisis. Frontline.
- Findler, P. (2015). Should Kids Play (American) Football? *Journal of the Philosophy of Sport*, 42(3), 443–462. doi.org/10.1080/00948705.2015.1079132.
- Foley, K. E. (2018, Feb. 1). Football will keep killing players until we change the way it's played. *Quartz*.
- Garber-Paul, E. (2020, Jan. 16). Aaron Hernandez Docuseries “Killer Inside” Adds New Depth to a Well-Told Story. *Rolling Stone*.
- Goodell, R. (2016). *Official Playing Rules of the National Football League*. 217.
- Guarnio, B. (2016, Oct. 13). Trump knocks ‘softer’ NFL rules: ‘Concussions — ‘Uh oh, got a little ding on the head?’ *Washington Post*.
- Guskiewicz, K. M., Marshall, S. W., Bailes, J., McCrea, M., Harding, H. P., Matthews, A., Mihalik, J. R., & Cantu, R. C. (2007). Recurrent concussion and risk of depression in retired professional football players. *Medicine and Science in Sports and Exercise*, 39(6), 903–909. doi.org/10.1249/mss.0b013e3180383da5
- Hamberger, A., Viano, D. C., Säljö, A., & Bolouri, H. (2009). Concussion in Professional Football: Morphology of Brain Injuries in the NFL Concussion Model, part 16. *Neurosurgery*, 64(6), 1174–1182. doi.org/10.1227/01.NEU.0000316855.40986.2A
- Harrison, E. A. (2014). The First Concussion Crisis: Head Injury and Evidence in Early American Football. *American Journal of Public Health*, 104(5), 822–833. doi.org/10.2105/AJPH.2013.301840
- Johnson, C. (2016, March 3). *NFLPA Letting Medical Science Point the Direction in Fight to Protect Players' Health and Safety*.
- Krasnow, E. G., & Levy, H. M. (1962). Unionization and Professional Sports. *Georgetown Law Journal*, 51(4), 749–782.

- Lafayette, J. (2020, Jan. 20). *NFL Games Score Big With 5% Boost in Viewership*. Broadcasting & Cable.
- Lim, M. (2012). Clicks, Cabs, and Coffee Houses: Social Media and Oppositional Movements in Egypt, 2004–2011. *Journal of Communication*, 62(2), 231–248. doi.org/10.1111/j.1460-2466.2012.01628.x
- Loria, K. (2015, March 24). Maybe football shouldn't be played at all. Business Insider.
- MacDonald, J., & Myer, G. D. (2016). 'Don't let kids play football': A killer idea. *British Journal of Sports Medicine*. doi.org/10.1136/bjsports-2016-096833
- Maske, M. (2013, March 24). NFL pushes forward in rule changes designed to reduce brain injuries, make game safer. *Washington Post*.
- Maske, M. (2018, Jan. 5). NFL allocates more than \$17 million to fund research into concussions and brain health. *Washington Post*.
- McDermott, J. (2017, July 12). The Connection Between Concussions, CTE and Acts of Violence. *MEL Magazine*.
- Mez, J., Daneshvar, D. H., Kiernan, P. T., Abdolmohammadi, B., Alvarez, V. E., Huber, B. R., Alosco, M. L., Solomon, T. M., Nowinski, C. J., McHale, L., Cormier, K. A., Kubilus, C. A., Martin, B. M., Murphy, L., Baugh, C. M., Montenigro, P. H., Chaisson, C. E., Tripodis, Y., Kowall, N. W., ... McKee, A. C. (2017). Clinicopathological Evaluation of Chronic Traumatic Encephalopathy in Players of American Football. *JAMA*, 318(4), 360–370. doi.org/10.1001/jama.2017.8334
- Milan, S. (2015). From social movements to cloud protesting: The evolution of collective identity. *Information, Communication & Society*, 18(8), 887–900. doi.org/10.1080/1369118X.2015.1043135
- Newman, S. (2019, Jan. 2). Tough Decision: Should You Let Your Child Play Football? *Psychology Today*.
- NFL. (2015, Oct. 7). National Football League. Health & Safety Press Releases. NFL.com.
- NFL. (2017, July 26). NFL issues response to CTE research report. NFL.com.
- NFL. (2019a). Health & Safety Rules Changes. NFL Football Operations.
- NFL. (2019b, Sep. 12). NFL Launches \$3 million challenge to create new helmet. NFL.com.
- NFL Operations. (n.d.). Evolution of the NFL Rules. NFL Football Operations.

- NFLPA. (2017, May 3). *NFLPA Launches “Your Mind, Your Body, Your Health” Wellness Campaign*.
- Omalu, B. (2015, Dec. 7). Don’t Let Kids Play Football. *New York Times*.
- Omalu, B. I., DeKosky, S. T., Minster, R. L., Kamboh, M. I., Hamilton, R. L., & Wecht, C. H. (2005). Chronic Traumatic Encephalopathy in a National Football League Player. *Neurosurgery*, 57(1), 128–134. doi.org/10.1227/01.NEU.0000163407.92769.ED
- Omalu, B. I., Hamilton, R. L., Kamboh, M. I., DeKosky, S. T., & Bailes, J. (2010). Chronic traumatic encephalopathy (CTE) in a National Football League Player: Case report and emerging medicolegal practice questions. *Journal of Forensic Nursing*, 6(1), 40–46. doi.org/10.1111/j.1939-3938.2009.01064.x
- Pellman, E. J., Lovell, M. R., Viano, D. C., & Casson, I. R. (2006). Concussion in Professional Football: Recovery of NFL and High School Athletes Assessed by Computerized Neuropsychological Testing, part 12. *Neurosurgery*, 58(2), 263–274. doi.org/10.1227/01.NEU.0000200272.56192.62
- Pesca, M. (2018, Oct. 23). *Has The NFL Gone Too Far with Its New Roughing the Passer Rules?* [Interview].
- Pietrosimone, B., Golightly, Y. M., Mihalik, J. P., & Guskiewicz, K. M. (2015). Concussion Frequency Associates with Musculoskeletal Injury in Retired NFL Players. *Medicine & Science in Sports & Exercise*, 47(11), 2366–2372. doi.org/10.1249/MSS.0000000000000684
- Sandoval-Almazan, R., & Ramon Gil-Garcia, J. (2014). Towards cyberactivism 2.0? Understanding the use of social media and other information technologies for political activism and social movements. *Government Information Quarterly*, 31(3), 365–378. doi.org/10.1016/j.giq.2013.10.016
- Serhan, Y. (2016, Sep. 14). The NFL Is Going to Spend \$100 Million on Concussion Research. *The Atlantic*.
- Stapleton, A. (2019, Nov. 18). If Your Kid Can Play Football, The NFL Is Looking For You. *Black America Web*.
- Stein, T. D., Alvarez, V. E., & McKee, A. C. (2014). Chronic traumatic encephalopathy: A spectrum of neuropathological changes following repetitive brain trauma in athletes and military personnel. *Alzheimer’s Research & Therapy*, 6(1), 4. doi.org/10.1186/alzrt234
- Strain, J., Didehbani, N., Cullum, C. M., Mansinghani, S., Conover, H., Kraut, M. A., Hart, J., & Womack, K. B. (2013). Depressive symptoms and white matter dysfunction in retired NFL players with concussion history. *Neurology*, 81(1), 25–32. doi.org/10.1212/WNL.0b013e318299ccf8

Weems, D. (2018, Oct. 24). Football is Becoming Soft. *The Delta Statement*.