

Improved Performance and Advancement of Player Safety in the National Football League

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On my honor as a University Student, I have neither given nor received unauthorized aid on this assignment as defined by the Honor Guidelines for Thesis-Related Assignments

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Introduction

How can sports be made safer and injuries be avoided? Since the beginning of athletic competition, injuries have accompanied ranging in severity from minor (e.g., bruises or scratches) to severe (e.g., breaks, tears, or contusions). In the sport of American football (“football”) injury is highly common, with between 1.5 and 2 injuries per 100 plays (Blumenthal, 2021). These injuries range in severity, with concussion and knee injuries being exceedingly common. As medical research has advanced, the knowledge of the nature and cause of injuries has been revealed resulting in further consideration of links between sports and injury. As these links have been defined, the field of player safety has emerged as groups attempt to keep athletes safe while continuing to allow them to play sports.

This paper will examine the player safety initiatives surrounding the National Football League (NFL). The examination will utilize the principles of the Social Construction of Technology to identify how player safety and performance improvements are made. By examining the social groups present to this discussion and their values, the methods through which player safety improvements have been made and shaped by these groups is explored. Each of these groups has a different orientation to the different player safety methods of rules changes, equipment technology advancements, data analysis, medical improvement, and coaching guidance based upon the role of their group. From this analysis it is determined there is a common value for making the NFL safer for players, but there is a divide present on the best methodology. The observed multidisciplinary approach that utilizes rule changes, equipment development, and others is the result of several social groups emphasizing different elements. As the groups collectively attempt to find a balance between enjoyability and safety the approaches are blended to come to a continually evolving best solution. The scope of this exploration has

been narrowed to the NFL in an effort to fully explore specific issues related to professional football in America, but this exploration may be extended to other sports of player safety as a whole.

Introduction of the Science, Technology, and Society Framework

To address this topic, I will be using the Social Construction of Technology (SCOT) framework. SCOT is a framework from the discipline of Science, Technology, and Society that deals with the ways in which technology and societal factors interact. The fundamental principle of SCOT is that successful technologies are determined by the social context in which they exist and develop (“Social Construction of Technology,” 2021). The social world is consulted in the success or failure of a technology. The principles of SCOT directly oppose the ideals of technological determinism, which argues better technology will always beat out competitors and society reacts to adapt the winner, by pointing to an alternative explanation and how it fails to explain certain historical applications (*Social Construction of Technology (SCOT) - Stswiki*, 2018).

SCOT can be broken into three main tenants: interpretive flexibility, relevant social groups, and stabilization (“Social Construction of Technology,” 2021; *Social Construction of Technology (SCOT) - Stswiki*, 2018). Interpretive flexibility refers to there being no objective, best, or perfect way to create technology, instead each group surrounding the issue which the technology is created to solve has a unique view of how to frame and solve the problem. In many cases, each group even has a different definition of the problem. Relevant social groups refer to any collection of individuals who share the same ideals with regards to the technology being developed. This refers to different organizations, job groups, etc. with interest in the technology and aligned viewpoints about how to address it. Finally, stabilization refers to the way in which a

technology becomes successful and integrated into practice. The first method of stabilization is by rhetorical closure where the technology is used to solve the problem, so that solution is talked about which leads to its integration. The common alternative method is redefinition where the problem is restated to reduce the flexibility in solutions and thus lead to acceptance of the technology.

Links between the STS framework and the topic

The principles of SCOT will be used to evaluate the efforts made for player safety. There are many ways improvements to the safety of NFL football players have been pursued historically and are being sought after currently. The complex nature of the game elicits several avenues by which player safety can be pursued. Additionally, the level of revenue generation for the game increases the efforts taken to continue improvement. At the center of this issue lies a balance between player safety and performance. Often there is a tradeoff between having an improvement in one of the aspects that detracts from the other, yet through technological innovation the sport community is trying to find ways to keep football players safer while retaining the competitive nature and storied history of the game that makes it so popular. The issue of player safety has been and continues to be pursued from many different angles that include technological development of more protective materials and equipment, rule changes that follow technology enabled analyses, medical advancements, coaching guidance, and other methods. The multitude of avenues for pursuit lends itself to interpretive flexibility by which the problem can be restated differently and elicit different solutions. The existence of social groups with a diverse set of beliefs about how to best approach athlete safety lends this discussion to a social construction of technology framework.

There is no one, objective, best way to pursue athlete safety. Various social groups view the technologies being developed to keep players safe with differing levels of support. Several of those groups and their views will be addressed in the following discussion.

Background

The National Football League

Founded in 1920, the National Football League (NFL) is a professional American football organization (trade association of individual teams) located in the United States (*National Football League | History & Teams | Britannica*, n.d.). Since play began in the early 20th century the league has grown to include 32 teams and has gained major popularity in the United States and around the world. In 2020 the revenue for the NFL was estimated to be \$12.2 billion, with league commissioner Roger Goodell targeting \$25 billion by 2027 (*How the NFL Makes Money*, n.d.). The NFL collects national revenue, primarily from television deals, and distributes it to the teams, but each team is also able to run independently and generate local revenue from ticket sales, concessions, and individual sponsorships (*How the NFL Makes Money*, n.d.). The NFL is the most viewed sport in the United States with Super Bowls, the league's championship game, consistently ranking among the most viewed broadcasts in history ("SUPER BOWL XLIX ON NBC IS MOST-WATCHED SHOW IN U.S. TELEVISION HISTORY," 2015). The NFL has developed a division for player health and safety with the motto "Building a better game" (*NFL.Com | Official Site of the National Football League*, n.d.).

Player Safety

Player safety refers to the health and wellbeing of athletes during performance of their sport. As medical knowledge has advanced more has become known about short- and long-term

damage done to players during their career. Player safety initiatives refer to the actions taken by the NFL or other groups to aid in recovery or prevent injury from ever happening. Head trauma is a common tackling related injury in football and is a known cause of concussions. Because researchers have traced cognitive impairments and mental illness to concussions, greater research attention has been committed to injury prevention (Manley et al., 2017). A 412% increase in the phrase “Player Safety” has been seen between 2000 and 2018 with Google Books Ngram Viewer showing a 0.0000001771% and 0.0000007305% citation rate respectively (*Google Books Ngram Viewer*, n.d.).

Social Groups

Researchers

One social group involved in the issues of player safety is the researchers who analyze information about gameplay and use the gleaned knowledge to find improvements to player safety. The analysis done by these researchers takes many forms including data analytics, physical testing, and computational modeling. These research groups use engineering and data science practices to understand various injuries that occur during gameplay or practice. The power given to these researchers depends on how closely they are involved with the NFL and the reputability of their analysis. Generally, the groups researching the injury mechanisms and mitigation methods are directly consulted by other parties and hold an accordingly high level of influence in the way athlete safety is pursued. Since the NFL contracts much of this work they are considered the experts in the field and thus inform decisionmakers from the scientific side.

One of these companies is Biocore LLC (Biocore), a biomechanics consulting firm that works with the NFL to study injury and risk mitigation. Biocore does research on helmets,

mouthguards, cleats, lower extremity injury, artificial turf, and others (*Home - Biocore LLC*, n.d.). The specific goal of the Biocore helmet research is “to provide actionable data that can inform rule-makers and ... provide information that can be used to improve upon existing helmet technology.” (*Home - Biocore LLC*, n.d.). These researchers approach player safety from the perspective of science and acknowledge the limitations to changes that can be made to gameplay. One facet of the group is its advocacy for coaching guidance and rule changes that can be supported with science. Additionally, the group supports development of new equipment designed to keep athletes safer. Moreover, this group supports technology being used to advance player safety as long as the technology is proven to have the impacts intended. Although not the final decision makers, this social group has the ability to support or negate a proposed player safety measure directly through data analytics and testing. The goal of these researchers is to enhance player safety, which results in a combined approach of rules changes alongside technological development.

Fans

The fans of NFL teams make up multiple social groups involved in the issues of player safety. They are a stakeholder in this issue because they are the consumers of the entertainment value provided by the NFL. The fans are the financial foundation for the entirety of the league and the sports entertainment industry as a whole because if they are not interested then the league will cease to have funding. These fans often have little power to advocate for certain issues related to gameplay, but can choose to support or reject the measures being taken with their consumption on the basis of activities such as viewing games, attending games, and purchasing merchandise.

Supportive

The first group is fans who are proponents of increased player safety measures. This group desires to see the longevity of players and the game of football extended. They see the high risk of injury as a threat to the game's future and want to protect it. NFL fan and commentator Colin Cowherd has spoken out in support of the rules change efforts taken by the NFL, saying "They have made the game much safer and much friendlier over the middle. I'm for it. The concerns for concussions are real, and the league has done a really good job. Practice is easier. The rules are better. It's never been safer" (*Tom Brady*, n.d.). This group views injury with grave concern and will accept great changes to performance and enjoyment for the benefit of enhanced safety.

Against

The other group includes those that do not want to see added safety measures or disagree with safety measures being used and explored. This group does not necessarily disagree with the sentiment of player safety but disagrees with the methods in which players are being protected. Much of this opposition comes to the rules put in place and how they impact play in the game of football. A study from Seton Hall University in 2018, after new safety rule implementation, determined that "31% of fans find [the] NFL less enjoyable with new safety rules" (*31% of Fans Find NFL Less Enjoyable with New Safety Rules This Year – The Seton Hall Sports Poll*, n.d.). One commented "What I believe the NFL is willing to do, and should do, is try to make the sport safer by using better technology in helmets to limit the impact and, after a certain number of concussions, to automatically retire a player for health reasons" (TODAY, n.d.). As a result, this group would rather see player safety pursued using technology that can keep players safer like new helmets than a new rule that discourages the physical nature of the game of football and is perceived as decreasing enjoyment.

Players

The larger group of NFL football players consists of two distinct social groups based on orientation to player safety initiatives. The players are stakeholders because they are the focus of any player safety measures. Accordingly, they are directly impacted by changes made in the form of changing regulation, coaching guidance, equipment developments, or any others. As the athletes they are very powerful stakeholders since if they disagree with something they can choose to not play and cost teams or the NFL revenue. Their power is compounded by their status as celebrities with large public followings, so they are able to speak to the changes they do or do not care for with a platform that will promote or detract change. There are very few, if any, NFL players to be found who entirely disagree with advancing player safety, but there is a large divide over the way that it is being pursued.

The largest point of contention centers around rules changes. There are players like NFL quarterback Tom Brady who have called for enhanced player safety in the form of rule change for leg protection, saying the league “should change some of those rules with defenseless receivers... everyone else has their legs protected in the NFL” (Fitzgerald, n.d.). Brady refers to rules changes previously made to protect some players that he believes should be extended for more widespread protection from low hits. Alternatively, other NFL players including Lorenzo Alexander and Richard Sherman oppose current and proposed rules changes, contending they unduly constrain defensive play. Commenting on a new NFL targeting rule in 2018, Alexander said “It is football at the end of the day. There are going to be injuries that you can’t avoid. You can’t legislate everything out” and Sherman commented “It’s ridiculous. Like telling a driver if you touch the lane lines, you’re getting a ticket. [It’s] gonna lead to more lower-extremity injuries” (Freeman, n.d.). The players in opposition may also wish to avoid fines and penalties.

Players in support of these rule changes speak out in support because to them it is the logical thing to do to preserve the players. For that group maintaining safety takes precedence over any impact it may have on the game. Notably, most of those in support of the rule changes are not in danger of committing an infraction under the rule due to their position of play. Those in opposition are vocal in their disapproval because of how the rules changes impacts their gameplay. They point to an inevitability of injury in a contact sport like football and how rule changes push injury from one type to another.

On the topic of technological improvements to equipment for player safety the players are generally in favor, but there remain some dissenting opinions. An example of support comes from the development of the VICIS Zero2 Trench, which was designed for offensive and defensive linemen including Lucas Patrick who commented “I loved it, because it’s designed to mitigate those repetitive hits we always get... I plan to play as long as I can, so I’m going to do everything I can to preserve the brain I have” (King, 2021). This group sees better equipment as an injury mitigation effort while continuing to enable high level performance. Dissenting opinions include Antonio Brown who had issues in 2018 when the Schutt AiR Advantage he had worn his entire career was disallowed as the NFL cracked down on the safety of specific models (*Explaining Antonio Brown’s Helmet Issue*, n.d.). Tom Brady was also forced to switch helmet model in response to the 2018 development and said “I don’t really love the one that I am in” (*Patriots’ Tom Brady on New Helmet*, 2019). There is dissention among some about equipment changes that are mostly on the basis of maintaining personal tradition, but the intensity of this opposition is frequently minor.

The issue of playing surface has become a large issue as well, where players are aligned into a single social group that is in support of natural surfaces. The players are observing the

increased prevalence of noncontact knee injuries on turf fields and are in strong support of moving all games to a natural grass because in their opinion it will promote safety, which is of utmost importance. Following Odell Beckham Jr.'s noncontact knee injury in the Super Bowl, which was played on artificial turf at SoFi Stadium there was an outpouring of comments on Twitter from NFL players protesting turf and calling for a switch to real grass (*Odell Beckham Jr.'s Injury in Super Bowl Prompts NFL Players to Speak out against Turf Fields*, n.d.). Those players included Nick Bosa, George Kittle, Nick Chubb, and many others. This demonstrates the widespread desire for player safety enhancement and how players use platform to shape change.

The players all have their own orientation towards different methods of player safety, but they continue to be in support of the overarching goal. The question for these social groups becomes what is allowing them to function at their highest level and for the longest duration so they can continue playing football. The players seek to advance their agenda on player safety implementation and shape what is done by talking amongst one another and making public statements of affirmation or condemnation.

Medical Professionals

Since player safety is intertwined with player health, medical professionals constitute another social group. These people are stakeholders because they are involved with the players and teams in pursuit of keeping players healthy and getting them back to competition from injury. The medical professionals are given a large amount of power due to their expertise in how to recover from injury and the strong emphasis players place on health so they can continue to do their job. The power in this group is in their ability to advise from a technical and scientific perspective. Dr. Arthur De Luigi, a sports medicine doctor, has said "I think that the NFL...regulations for player safety are paramount" when referring to rules that protect the head and neck of players

(<https://www.washingtontimes.com> & Daniels, n.d.). The NFL chief medical officer Allen Sills has spoken from the medical community in support of research that allows them “to see what the body is actually feeling” (*Mouthguard Sensors Help Provide Research on Player Safety*, 2021). In addition, the medical community is consistently pushing the bounds of recovery and knowledge so injuries can be better understood and treated should they occur. The medical professional group values the health of players above other factors and seeks to promote any change, including rules and technological advancements, that will protect against injury.

The National Football League

The final social group is the NFL and its management. This group is a stakeholder because they are the organization under which the game of football is played professionally and watch over all teams and players. They are also in charge of making all regulation for gameplay. As a result, the NFL has a large amount of power because they control the divisions that set rules, look into player safety, and are who all teams and players must look to for guidance. The NFL has made over 50 rules changes to reduce risk for players since 2002, demonstrating their desire to keep player safe and ensure the integrity of football for the future (*Better Rules to Build a Better Game*, n.d.). The NFL notes that it has “supported critical innovation in helmet design” for safer play and they are “collecting more data than ever to better understand how injuries occur and ultimately keep players safer while making the game more exciting” with industry partners (*NFL, NFLPA Release 2021 Helmet Laboratory Testing Performance Results*, n.d.; *WATCH*, n.d.). League commissioner Roger Goodell commented making the game safer and retaining fun in football “had to be our number one objective” (*WATCH*, n.d.). As a for profit institution, revenue is paramount to the NFL. Additionally, it is making efforts and investing in an approach to player safety that is going to preserve the game for its future. To protect revenue,

the league must balance the entertainment value of the game against player safety and find the combination of rule changes and equipment technology development that optimize its position.

Discussion

The efforts for player safety we see in current practice come from the input of each one of these social groups. As it is laid out, each group is approaching player safety from its own perspective and with its own ideas about what the best solution is. In all cases the social groups are in favor of player safety, but do not want it to be at an expense to their ability. This is clearly seen by defensive players who are in favor of their teammates and opponents remaining safe, but are opposed to increased rules enforcement that punish their position primarily. In some cases, such as those defensive players, there are conditions to what is seen as an acceptable method for player safety enhancement, but to other social groups a different method may be more acceptable or any method may be acceptable.

The analysis done revealed that in the field of player safety for the NFL stabilization occurs by rhetorical closure. This means that decisions on which technology succeed or fail are made by conversation surrounding the issue and proposed solution. With the high publicity of the NFL, the solution reached faces a high level of scrutiny by many in power to make significant impacts to technology success. As most have found no issue with technological developments to equipment and many have been intrigued by the enhanced level of safety, they are afforded by greater technology in football these measures have been successfully implemented. Although these changes can cause a disruption to gameplay they have been largely welcomed. Conversely, rule changes and coaching guidance have been much less likely to succeed due to push back from several social groups. The fans and players alike have vocal groups that oppose rule changes because of their perceived gameplay detriment. As a result, even

developments with strong technological and analytical development have been sparingly successful. With the level of scrutiny rule changes face the methods by which a recommendation must be reached are required to be clear and significant. Moreover, the multitude of social groups involved in player safety considerations dwindle the possible technological developments down to a select few that are used by their balance between safety and enjoyability.

Conclusion

Many methods have been attempted to make sports safer and avoid injury. Injuries both severe and minor have been a part of athletic competition for the entirety of its existence. The high prevalence of injury in American football is of significant interest due to the impacts on play at the professional, amateur, and youth level. The high incidence of injury, along with new medical discoveries about long term injury impacts has resulted in more attention given to the links between sport and injury. As the connection has been explored a player safety emphasis has emerged to continue play while also keeping athletes safe.

This paper explored player safety initiatives in the NFL and used the framework of the SCOT. Through examination of the social groups relevant to this discussion, their values, and their influence positions the methods through which player safety and performance improvements have been made was elucidated. Each group is unique in its influence level, issue orientation, and method preference, but there was a common value in support of player safety. The groups each had opinions on rule changes, equipment-based technology advancements, data analytics, medical improvement, and coaching guidance that revolved around the role they played. The divide in preferred methodology has resulted in the multifaceted approach that uses elements of each type. Certain methods, like rule changes, faced more opposition than others, such as equipment developments. In accordance with SCOT a decision of which technologies are

successful in the field was made through rhetorical closure. These approaches have been blended to create a solution with the optimal balance between safety and enjoyability of football.

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