

THE TRANSITION OF THE COLLEGE QUARTERBACK TO THE NFL: WHY THE
HARDEST POSITION IN SPORTS IS GETTING EASIER

by

Derik Abbott

Submitted in Partial Fulfillment of the Requirements
for the Degree of Master of Fine Arts in Mass Communications
at
Lindenwood University

December 2018, Derik Abbott

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THE TRANSITION OF THE COLLEGE QUARTERBACK TO THE NFL:
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ABSTRACT

Title of Thesis: The Transition of the College Quarterback to the NFL: Why the Hardest Position in Sports is Getting Easier

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The NFL is changing. Score boards are being lit up by young quarterbacks like never seen before. Rookie quarterbacks are playing like 10 year veterans. Offenses are playing at light speed paces. But why? This Thesis paper looks to uncover why college quarterbacks are playing at MVP caliber levels at such a young age. With research in multiple fields such as analytics, neuroscience, youth football developmental leagues and artificial intelligence,, this paper seeks to determine the relationship between what strategies front offices and coaching staffs are using and the high success rate of young quarterbacks in the National Football League. This paper hypothesizes that NFL manipulate the rookie salary cap to their advantage, a direct correlation between teachings in at grassroots football programs and accelerated development of players, and changes to NFL rules allowing for a more open game, is helping assisting young quarterbacks develop in healthy, stable environments.

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I. Introduction

In 2015, USA Today called playing quarterback in the National Football League the “hardest job in the world¹.” While there are plenty of difficult jobs in the world that require far more heroism and self-sacrifice, the position of starting quarterback in the NFL is held by only 32 men, or , 0.0000001 of the US population. It is an exclusive fraternity that only a few thrive in.

The driving force of the NFL offense is the quarterback. The quarterback position is arguably, the most coveted and difficult position in all of sports. The quarterback must be able to identify and manipulate a defense, remain calm under pressure, relay calls and plays to his teammates, execute the play that is called, and lead his team. It is no small task even for the most experienced player.

Since the inception of the National Football League in 1920, it was believed defense won championships. A stout run-stopping front, big linebackers, and hard-hitting safeties were necessary components to be a successful team. In a time when the forward passing game was in its infancy, scoring more than 20 points was rare.

Fast forward nearly 100 years later and the script has been flipped. The NFL has never been more wide open. It seems as though a different scoring record is being broken every week and at a far greater pace. NFL offenses resemble a perfectly orchestrated symphony with creative shifts, misdirection, and play calls. Since the start of World War II, a home team scoring 36 points or more and not committing a single turnover has won 402 out 406 times.² Two of those

¹ Chase, Chris. "Why Are There Only 10 Good NFL Quarterbacks in the Entire World?" USA Today. October 19, 2015.

² Falcons Life Forums, September 30, 2018,

loses are owned by the 2018 Atlanta Falcons after falling to the Cincinnati Bengals (36-37) and the New Orleans Saints (37-43).

Much has changed in the last 100 years. Quarterbacks are now more athletic and intellectual, than they have ever been. While there are some aspects of the position that are measurable such as arm strength, speed, accuracy, etc., other aspects such as toughness and leadership are more difficult to predict and often can lead to disastrous draft picks..

Yet in the last five years, there has been an abundance of young quarterbacks who have emerged and been playing at an MVP caliber level. Names such as Patrick Mahomes, Russell Wilson, Jared Goff, and Deshaun Watson have taken the league by storm, breaking countless records, leading divisions and even winning Super Bowls.

This challenges the two narratives in pro football. 1. Starting a rookie quarterback is a mistake and should sit behind a veteran and learn. 2. Quarterbacks from colleges who run a spread offense do not transition well into the National Football League.

While the spread offense is thought to be a gimmicky college offense by many old-school NFL coaches³, the concepts of the spread have appeared throughout the NFL's history during different time periods.

In the 1950's, teams relied on a running game called the triple option. This 3 yards and a cloud of dust offense involved quick handoffs, option pitches, and a quarterback with a sleight of hand that could run the football as effective as the running backs.

During the 1980's, Bill Walsh revolutionized the game of football with his West Coast Offense. The West Coast Offense relied on quick, intermediate passing concepts and high percentage throws. The offense was made to be executed with perfect timing and precision.

³ Florio, M. (2017, July 17). Bruce Arians is no fan of the spread offense

Walsh demanded perfection from his quarterbacks and their ability to be football smart. He required them be able to change plays at the line and developed Hall of Famer Joe Montana into the one of the greatest quarterbacks in NFL history.

In the early 1990's, Marv Levy and the K-Gun offense ran teams off the field with their fast style of play. Led by Hall of Fame quarterback Jim Kelly, the Buffalo Bills used a constant hurry up style of offense to wear out a defense. The goal was to force defenses into a panic and run their basic defensive calls. While Walsh and the West Coast Offense stressed teams horizontally, Levy and the K-Gun Offense looked to put stress on safeties by using a vertical passing game and getting members of the secondary to choose a player to cover.

In today's game, offenses rely on quick tempos, misdirection in the backfield with the running back and quarterback, short and efficient passes and stress on safeties in the vertical passing game. All concepts that are taken from offensive systems of the past.

As someone who is wanting to work in the NFL and front office, I have found this offensive renaissance of the last 5 years to be extremely intriguing. The norms of what it takes to be a successful NFL quarterback are being challenged every Sunday. Legendary football coach Bill Parcells once wrote his criteria for drafting an NFL quarterback prospect⁴. In order to even be listed on Parcell's draft board, a prospect must meet most, if not all, of these requirements:

1. Be a three-year starter
2. Be a senior in college
3. Graduate from college
4. Start 30 games
5. Win 23 games

⁴ B, John. "How Accurate Are the Bill Parcells Rules for Drafting Quarterbacks?" Gang Green Nation. April 04, 2016.

6. Post a 2:1 touchdown-to-interception ratio
7. Complete at least 60% of passes thrown

To many, this would seem like an easy list to abide by, as long as a prospect checks off all the boxes, a general manager should draft him. Simple, right? To put it in perspective, former Denver Broncos quarterback-turned minor league baseball player Tim Tebow checked off all the boxes. Tebow was a Heisman trophy winner at the University of Florida, racking up more than 9,000 passing yards, 88 touchdowns, only 16 interceptions and a 67% completion rate. He won two national championship titles with the Gators and posted a record of 35-6 as a 3year starter. Tebow started one season in the NFL before switching to pursue a career in baseball in 2016. Five time Super Bowl champion Tom Brady, only checked off four boxes. Brady spent the majority his junior and the beginning of his senior year at Michigan splitting time with quarterback Drew Henson.

Evaluating and projecting a quarterback's success at the NFL level is almost as hard as playing the position itself. There is no formula and in recent years, there is no prototype any longer.

It was once thought that to be a successful quarterback, one needed to be a certain height or weight, run a certain 40yard dash time, or throw a certain distance. Every time that there is a standard, there is an exception to the standard that changes the way NFL teams think. At 6', Saints quarterback Drew Brees was seen as too small to play in the NFL. With his success, Brees paved the road for other short quarterbacks such as Russell Wilson and Baker

Mayfield. Michael Vick set the standard for what it meant to be a dual-threat quarterback. Without Michael Vick, players like Lamar Jackson and Deshaun Watson.⁵

In today's NFL, there has been a rebirth at the quarterback position. The days of the holding the clipboard for a year and learning the pro-style seem to be on its way out along with the older generation of QB's such as Ben Roethlisberger and Tom Brady. A decade ago, starting a rookie quarterback who played in a spread system in college has unheard of and thought to be coaching suicide.

The question of why these quarterbacks have been more successful than their earlier counterparts has been discussed but not in depth. I believe it is pivotal to be able to understand what is making these quarterbacks perform at such a high level so early in their careers. The NFL is a constantly changing league. To be able to understand and research the current field will lead to new creative ideas that could spur the next enlightening movement in the NFL. This paper will seek to understand the many aspects of not only the NFL game on the field, but the strategies of general managers and what is being taught at the younger levels. It is hypothesized that a culmination of events are occurring that are creating a shift in the game. It is also hypothesized that the initiative to protect children from head injuries while playing football has prompted kids to find other avenues to learn and develop the quarterback position and in turn, become more mentally developed for the higher levels when they reach them. With that organizations are willing to thrust quarterbacks into starting roles with the support of the rookie salary cap and reinforced with the NFL rule chang

⁵ Rivers, Jeff. "Mahomes, Prescott, Wilson and Now Jackson Are Not Just 'dual-threat' QBs." The Undefeated. December 03, 2018.

II. Literature Review / State of the Field

While this is still a relatively new topic, other fields of study such as business, medicine, neuroscience, psychology, and as well as data and analytics gathered from the NFL databases can be used to detect current trends. It is believed there is enough analytical data to generate data, as well as the use of Next Gen stats to support these claims.

However, it can be suggested that there is a youth movement occurring at the quarterback position. New England Patriots quarterback Tom Brady has played 17 years in the national football league. It would take a combination of years experienced from Deshaun Watson, Carson Wentz, Jared Goff, Patrick Mahomes, Sam Darnold, Josh Allen, Josh Rosen, Dak Prescott, and Trubisky to match his number of years.

In order to understand the intricacies of an NFL front office and how NFL rosters are carefully crafted, understanding the salary cap and the way that it is structured is vital to the rest of the research. The NFL rookie cap is part of the NFL's Collective Bargaining Agreement that was agreed upon in 2011 between the NFL and the National Football League Players Association (NFLPA). The CBA outlines the labor agreement that has been negotiated and agreed upon (NFL, 2011). The 2011 CBA also contains information pertaining to the new rookie compensation rule during the NFL draft. The CBA explains the new rules and parameters that pertain to the rookie compensation pool and the compensation growth. The compensation growth is set at 25% of year-one salaries (Keefer, 2016). By understanding the cap, the research is able to look at the scope of the NFL landscape and understand why certain roster moves are made and what the goal of each team every year. Every team is not aiming to win the Super Bowl every year. Some are aiming to rebuild for future drafts or future free agents.

The work of Mike Lombardi throughout the NFL is one that is well documented. Before publishing his book *Gridiron Genius*, Lombardi worked with some of the greatest minds to ever be a part of the game of football such as Bill Walsh, Al Davis, and Bill Belichick. Lombardi won Super Bowls under Bill Walsh (scout) in San Francisco and Bill Belichick (assistant to the head coach) in New England. While in Cleveland, Lombardi, Belichick, and Nick Saban helped devise the modern way of NFL scouting.⁶ Lombardi and the rest claim they created the grading system for prospects. Lombardi extensively discusses how the great coaches that he was with developed quarterbacks and the philosophies that he used to do so. His “make the system fit the player” (Lombardi, 2018) instead of the other way around is something that is still used in today’s game by some of the top organizations in football and has had success at every level.

Chronic traumatic encephalopathy (CTE) is becoming one of the most discussed diseases in not only football, but all contact sports. Contrary to long-believed myths, CTE is not caused solely by concussions but, rather, by repeated hits to the head and the buildup of hyperphosphorylated tau and TDP-43 proteins. (Omalu BI1, DeKosky ST, Minster RL, Kamboh MI, Hamilton RL, Wecht CH, 2005). (Stern, Riley, Daneshvar, Nowinski, Cantu, McKee, 2011). The study done by Dr. Bennet Omalu concluded that former Pittsburgh Steelers offensive lineman Mike Webster was suffering from a severe case of the disease prior to his death. Understanding the disease that is causing youth tackle football organizations numbers to fall drastically and getting the attention of the NFL is important in understanding why it is impacting youth levels. Looking at the rippling effect that the disease has had on families could show how

⁶ Lombardi, M., & Belichick, B. (2018). *Gridiron genius: A master class in winning championships and building dynasties in the NFL*. New York: Crown Archetype.

football programs and leagues are taking measures to prevent these injuries and the impact CTE is having on the game from a safety and player development aspect.

Following the discovery of CTE and the continuation of published works on the disease, researchers began to assess the proper age to allow children to play tackle football. A study by Boston University suggested that athletes who want to play tackle football, should wait until the age of 14 (Stern, Riley, Daneshvar, Nowinski, Cantu, McKee, 2011). The study suggested that beginning tackle football at a young age can cause earlier onset of cognitive problems within 2.5 years. BU's CTE Center, noted that of the 246 players tested, 211 had been diagnosed with CTE after death. The remaining 35 showed signs of other neurodegenerative diseases similar to Alzheimer's disease (McKee, 2011). Similar to the Omalu study, the study sent shockwaves around the football world in early 2018 with its findings. Many organizations and families stepped away from tackle football. This drastic shift in the minds of parents and its potential impact should be studied to understand the direction of the new generation of football players.

With the prior articles pertaining to CTE and the medical aspects of it, the Aspen Institute analyzed the situation from a football stand point and how young athletes are adapting to flag football instead of tackle football. The institute reported on the fall of high school participation numbers. In 2017, high school football participation fell by over 20,000 players and marks the fourth consecutive year it has fallen (Farrey, 2018). Aspen talked extensively about how many athletes are turning to flag football and to seven-on-seven leagues. These leagues help refine skill players abilities with a decrease chance of traumatic injury. The majority of participants are between the ages of 6-12; just before the suggestion of the BU study⁷. Aspen's study concluded

⁷ Farrey, T. (2018, September 22). The Benefits of Shifting from Tackle to Flag Football for Youth. Retrieved from

that there is “no evidence to suggest youth tackle participation is a necessary precondition for high school, college and professional success, nor any showing that exposure to tackle football prior to high school reduces the risk of injury” (Farrey, 2018). Aspen suggested that the generation of younger athletes transitioning to play in the NFL could be different. The potential shift could be beneficial for position offensive and defensive skill positions. Since there is no contact, quarterbacks are able to survey the field, process their reads and throw the football.

Video games have become a staple in our society. It is used as a teaching tool in multiple fields throughout a vast number of industries. David Williamson Shaffer, Kurt R. Squire, Richard Halverson, and James P. Gee of the Wisconsin Center for Education Research believe that while video games have bad connotations associated as causing people to have false realities and often provoke violent themes. They hypothesized that these game can in turn be used for educational purposes and environmental learning (Shaffer, Kurt, Squire, Halverson, Gee, 2005). They suggested that implementing video games be used in schools as well for educational purposes.

With the rise of video games in today's society, it was researched how some organizations are training their employees through video games. The military forces use life-like simulations to help train their operatives to fight the battles before actually fighting the battles. It helps teach their soldiers what to do and what not to do on the battlefield. In her dissertation, Sennersten states that the primary goal of developing any training system is to provide a level of training that translates to enhanced performance on the types of real world tasks being simulated (Sennersten, 2010). This brings a new angle to the research of the paper, how can video games like Madden, help mentally train athletes? Also, is it realistic enough to be a credible source of

education in the football market? Madden has become a cultural staple and is now used at competitive gaming tournaments. Madden could be a new way of reaching a new generation of gamers and athletes in the near future and be a major contributor to player development at higher levels.

Intelligence and decision making processes are arguably the most important traits to an NFL quarterback. However to understand someone's decision, one must understand the thought process behind it and what ways are the most effective strategies for learning. David Redish's book *The mind within the brain: How we make decisions and how those decisions go wrong*, Redish discusses how we make decisions and the influence on those decisions. Redish discusses having two system of brain operation and compared the human brain to a "machine."⁸ He stated that he having long term and short term thought and decision making processes are essential to the position. With the quarterback being such a critical thinking position, a coach and quarterback must be on the same page and have the same mindset at all times. By understanding what a player is thinking, a coach may be able to tap into his players' full potential by pressing the correct buttons. In an article an article with Sports Illustrated, Redish described the process of learning an NFL playbook as playing a "musical instrument that is scheming against you."⁹

The last form of learning that was used was word association and how the brain sees and associates certain images or words. Word association falls under two categories: syntagmatic and paradigmatic. Syntagmatic associations: responses which form an on definitive link with the

⁸ Redish, A. D. (2015). *The mind within the brain: How we make decisions and how those decisions go wrong*. New York: Oxford University Press.

⁹ Treadway, D. (2014, August 4). *Brain Games: A top neuroscientist explains how difficult it is to master an NFL readway*, 20914.

stimulus word. Paradigmatic associations: responses which form from the same grammatical class as the stimulant (Meara, 2009). It is hopeful that this research will be useful in terms of showing and expedited development process of quarterbacks by using linguistics and word association. This particular study will look at how NFL play calls are changing to better assist players in understanding the playbook.

While the NFL may be slow to the party in terms of analytics, the NFL is catching up quickly is finding new ways to utilize analytics to better understand different parts of the game. NFL Next Gen Stats give up-to-date statistics on every NFL player. This includes fastest runner, a route tracker and a QB map to see total QBR from all parts of the field. Data and analytics help determine what aspects of a game a quarterback is a good at and what aspects he is not. The use of Next Gen Stats allows the research of this thesis to have concrete football evidence of any correlations, improvements or declines.

All of these listed resources assisted with the development of the paper. Using other industries to understand trends such as psychology, strategies of decision making, historical context, and statistics and analytics. From a historical aspect, football has gone through numerous changes since its inception in the early 1900's but determining why it is changing and its current direction is pivotal for those who hope to be successful in the business and have staying power in a league that has a turnover rate like no other.¹⁰

¹⁰ Barnett, Zach. "There Have Been 68 NFL Coaching Changes in the Last Decade." FootballScoop. June 30, 2014.

III. Methodology

This research plans on taking a unique approach in its methodology. It will be researching four different plausible causes for heighten quarterback play by rookies and second year quarterbacks in the National Football League. Football researchers only want to look at football reasons for a player is playing well. A football analyst might say the player has a great arm or great vision. But why does the player have these traits? Was he taught at a young age? Is he learning from a different perspective that is accelerating his thinking? This research will look into a variety of factors such as those.

The first method is analyzing the NFL salary cap and how much each team has left in cap room. The NFL salary cap is an important part of a team's economics. With the limitations set by the 2011 CBA, teams have to manipulate the system and use cheap contracts to their advantage and how they are build their rosters. This paper looks to uncover what kind of pieces teams are putting around a young quarterback to help him succeed and what kind of analytics and data can be uncovered to support these claims. Also, what kind of model are current teams looking at for inspiration to model their franchise after?

The second method will be analyzing how youth football programs have handled the reports of CTE in professional athletes. By researching current trends by youth programs, research be able to identify what kind of techniques are being taught at youth levels now and how they are helping younger quarterbacks in the future. What are kids doing at the youth levels to help them advance their development for the next levels and how is technology advancing these traits?

The third method will compare how the NFL game is now being influenced by the college game. What inspirations are NFL coaches looking for from the college and high school ranks and how are they using them effectively in their organization? By using research into thought-processing systems, it will hopefully be determined how NFL coaches enabling players to just play instead of think; a complex that has caused some of the greatest college quarterbacks to crumble at the next level. This will also include research into linguistics and how college terminology may result in faster learning processes because of word association in play calling.

Lastly, the NFL has made a wide variety of rule changes due to injuries to some of the game's biggest names. These rules benefit the offensive side of the football. With the support of analytics from Next Gen, this paper intendeds how teams taken advantage of these rules to exploit defenses have and how it is setting a cleaner path for a young quarterback's development. In years prior, some of the NFL's greatest players have suffered from catastrophic injuries that cut their careers short. Names such as Joe Namath and Steve Young suffered injuries that resulted in early retirement.

IV. Production and Analysis

1. Production

a. The Rookie Salary Cap

In the years prior to the NFL salary cap, the NFL operated in the same way that Major League Baseball does; without a salary cap.¹¹ Teams were able to spend as much as they could make and owned the rights to their players (yes, owned) as free agency would not come about until the 1990's. Between 1946 and 1964, the Cleveland Browns amassed NFL and AFL 8 championships based purely on the fact they had more money than everyone else (Charlton, 2018).

In 1993, the NFL and the National Football League Players Association (NFLPA) agreed upon a league wide salary cap that would restrict the amount of money that each team was allowed to use. The cap was created with the intent of creating more parity throughout the league and not allow a "top heavy" league, similar to what is seen in Major League Baseball today.

In 2018, (Figure 1) the salary cap for the 2018-2019 NFL season was set at \$178 million. This year, the San Francisco 49ers, Cleveland Browns, New York Jets, and Indianapolis Colts all have the most open cap space to work with (Verdame, 2017). This money includes the money that is currently being used by NFL rosters, active cap space, and dead money. With the salary cap, there is also a league minimum and a veteran minimum. Players who have been on an active roster for more than four or more years are required to earn at least \$630,000 for only one year and must not have a bonus that surpasses \$90,000 (Spotrac, 2018).

¹¹ Perry, Dayn. "No, Baseball (still) Doesn't Need a Salary Cap." CBSSports.com. June 02, 2015.

Rookie's minimums and players who have not been on an active roster for more than four years have a different scale. The rookie minimum increases the same way that veteran minimum does; \$15,000 per year. In 2018, the NFL league minimum is \$480,000 and alters by the amount of years played (Ginnitti, 2018). For example, If "Player X has played in the NFL for two seasons prior to the beginning for the 2018 season, he is slotted to make \$630,000 (Figure 2). Veteran minimum and the rookie cap has essentially eliminated the "middle class" in the NFL. Veterans who only play special teams and have no fixed position are less likely to be signed. Teams are using other skill players to fill the void of a punter returner instead of a punt return specialist because teams do deem a player who will have a limited role is not worth large amount of money they would have to paid because he is a veteran.

Prior to the Rookie Cap, teams were allowed to sign rookies to whatever contracts they deemed fit. In the case of some first overall picks such as Jamarcus Russell, a huge contract can sink an entire franchise. Russell was the first overall pick of the Oakland Raiders in 2007 out of Louisiana State University. In 2007, Russell signed a \$61,000,000 contract that included \$32 million of guaranteed money (Spotrac, 2018). In 2007, the league salary cap for each team was \$107 million. Meaning, one player ate up more than half of a team's cap space before even suiting up for a Sunday in the NFL. This creates challenges for general managers and front office executives that are trying to piece together a championship organization. Contracts such as Russell's leave teams imprisoned to players and restricts their ability to sign future players and free agents. Prior to the CBA, teams that could not afford "Player X" that was supposed to be a high draft pick because of their contract demands, were forced to trade down in the draft or rework their entire roster if they deemed the player good enough. If they player turned out to be a bust, it could set a franchise and front office back years.

Jamarcus Russell would play for the Raiders for only 3 seasons upon being cut by the team in 2009 after posting a 7-19 record as the Raiders starting quarterback. While not being on the team, the Raiders were still required to pay Russell since he was still under contract. Russell continued to be a hit against the Raiders cap until 2010 and caused \$18,923,850 in dead cap space (Spotrac, 2018).

However in 2011, the Collective Bargaining Agreement (CBA) was renegotiated and a Rookie Salary Cap was put into for the NFL draft. The 2011 CBA instituted two new ways that drafted players were paid. The first was the rookie wage scale. The players wage is based on selection number and round. Second, was a limit placed on compensation growth of 25% of year-one salary; meaning a player's contract could not be front loaded in the first 2 years of the contract (Keefer, 2016).

This means that every draft pick is slotted with a certain amount of money depending on the position and where they are drafted. The NFL's rookie compensation pool is slotted at approximately \$5.2 billion for the 2019 draft and is distributed league wide (Belzer, 2018). Teams with more draft picks in higher rounds will receive a larger portion of the money in order to pay their players. The higher the pick and the round, the more money is slotted to the player. Each rookie contract is also an automatic 4-year contract, with the option to pick up a Fifth-Year-Option.

The option allows a team to retain a player's rights for five years rather than the standard four, which is the bonus of selecting a player in the first round. In order to extend the contract, the team must inform the player during the period between the last regular season game of his third contract year and May 3 of the next League Year (Art. 7, Sec. 7, (a), 31). The Fifth-Year Option is non-negotiable,

and the non-compensation terms from a player's rookie contract will be transferred to the fifth year. Terms allowed in other contracts are prohibited from being added into the Fifth-Year Option. These terms include Option Bonuses, Option Exercise Fees, option Non-Exercise fees, Option Buyouts, or any other compensation that stems from the team exercising or declining the Fifth-year option (Sec. 7 (d), 31¹²

With players high draft pick players not tying down organizations, the way that front offices and organizations have changed in the way the approach the draft and build their team. While quarterbacks are set at a high premium, a "draft bust" is less likely to damage an organization. One needs to look no further than the first Win-Now roster in the post CBA era model of 2013 and 2014 Seattle Seahawks.

In 2013, the Seattle Seahawks posted a 13-3 record and defeated Peyton Manning and the Denver Broncos in Super Bowl XLVIII by a score of 43-8. Seattle used a dominating defense, a strong running game and a Pro Bowl quarterback in his second year to power their way to their first Super Bowl title in franchise history.

In 2014, Seattle returned to the big stage with vastly the same roster, only to fall to the New England Patriots, 28-24.

Seattle Quarterback Russell Wilson was picked in the 3rd round in 2012 NFL Draft, Wilson gained the starting position as a rookie. Because of the new CBA rules, and Wilson being a 3rd round pick, his base salary was only \$526,217 and signing bonus of \$154,868. A major discount for a franchise quarterback.

¹² "NFL Rookie Contracts Explained: Fifth-Year Option." Front Office Football. April 10, 2018.

In 2013, Wilson was listed as 50th highest paid quarterback in the NFL and the Seattle Seahawks were listed 30th out of 32 teams in cumulative quarterback positional spending in 2013 (Spotrac, 2013).

However, with Seattle not spending money on the quarterback position, where is the money going? Seattle was able to pay the players they had drafted in years prior. Russell Okung, Cliff Avril, Michael Bennett and Earl Thomas were all players that received pay raises during Wilson's first years there.

Seattle was also able to retain and sign free agents such as Marshawn Lynch and Percy Harvin to surround Wilson with the talent that they already had. In 2013 and 2014, Seattle averaged a combined 4.8 yards per carry. Seattle's run game was ranked 4th (136ypg) in 2013 and 1st (172ypg) in 2014. When an offense is able to establish the run and a game early and set themselves up for 2nd and 5 or less, the percentage of conversion is 75%. On 3rd down and 5 or less, the conversion rate is 57% (Schechtman-Rook, 2014). Schematically, this allows an offensive coordinator to use his entire playbook. Play action passes that allow a quarterback to make easy throws and move the pocket and high percentage throws from the pocket are ways to get a young quarterback into a game and gain confidence.

In addition to complementary weapons on the perimeter and backfield, Seattle had the #1 ranked defense in both 2013 and 2014 (PFR, 2013) (PFR,2014). In both 2013 and 2014 Seattle ranked 1st in Passing Yards per Game and 3rd in Rush Yards per Game.

In 2015, after Wilson's 3rd year, Seattle jumped the gun and to pay him top dollar and the rookie discount was no more. Wilson signed a 4 year extension worth \$87.6 million with \$61.5 million in guarantees. With the signing came a cost. Seattle was unable to resign some of their key players such as Richard Sherman, Michael Bennett, Russell Okung, Max Unger, and Bruce

Irvin. However, it is without question that the components around Wilson during his younger years helped him develop into one of the more elite quarterbacks in the NFL right now.

In 2016, the Philadelphia Eagles drafted Carson Wentz with the second overall pick in the NFL draft. After finishing 7-9, the Eagles made key offseason acquisitions to beef up their roster. With Carson Wentz only taking up only taking up \$6 million in cap space (SPOTRAC, 2016), The Eagles became major players in the off-season frenzy. The Eagles signed wide receivers Torrey Smith and Alshon Jeffery to help Wentz in the pass game. They also added former Patriot defensive linemen Chris Long and running back LeGarrette Blount; both of whom would go on to have key roles in the Eagles Super Bowl run. The Eagles had the 3rd best rushing attack in the NFL in 2017 as well as the 4th ranked defense. The most critical signing was the re-acquisition of quarterback Nick Foles from Kansas City. Foles was signed to a 2-year \$11 Million deal. During week 14 of the regular season, Carson Wentz tore his ACL and was out for the remainder of the season. Foles would take over the starting role and lead the Eagles to their first Super Bowl championship.

A more current example of how the rookie cap model has assisted team structure and the growth of a young quarterback is in Los Angeles with the Rams. Quarterback Jared Goff was the first overall selection of the Rams in 2016. Goff took over a 7-9 Rams team that had previously drafted two Pro Bowl players in the last two drafts; Aaron Donald and Todd Gurley. However they were unable to capitalize off of their talent and move past the 7-9 mark Goff's rookie year.

In 2017, the Rams hired offensive minded coach Sean McVay to be their new head coach. McVay and Les Snead retooled the Rams roster and playbook in order to fit the needs and

strengths of Goff. The Rams vastly improved in all facets of the game. Goff transitioned from a potential bust to a second year phenom and improved his statistics in nearly every category.

By recognizing the talent that the Rams had, General Manager Les Snead took the same approach as the Seattle Seahawks did and the Philadelphia Eagles did in 2017; win now.¹³ Upon the start for the 2018 season, (Figure 3.) the Philadelphia Eagles and Los Angeles Rams sit at 28th and 29th in total quarterback cap percentage. Both the Eagles and Seahawks made major free agent signings to help elevate their teams. Seattle signed Cliff Avril and Michael Bennett to boost their defensive line.

Due to the rookie cap in the NFL draft, Jared Goff's contract is set to only account for \$7.6 million against the Rams cap in 2018 (Spotrac, 2018). In comparison, Goff's division rival in Seattle is set to account for \$23.7 million. With Goff, Gurley, and Donald all playing on rookie deals, it allows the Rams to hit the open market and surround their new star quarterback. A discount that big on three star players freed up \$45 million in cap space. The Rams recognize that they will have to pay these players at some point. While they are on these discount contracts, the window of opportunity to win a championship is right now.

During the 2018 offseason, the Rams acquired former defensive Pro Bowlers Marcus Peters, Aquib Talib, Sam Shields, Dante Fowler Jr. and Ndamuking Suh. Through week 14 of the 2018 regular season, the Rams currently lead the NFL in sacks and are tied for second in turnover differential (+11)(ESPN, 2018). By creating turnovers on the defensive side of the football, Goff and the offense have more opportunities to put points on the scoreboard and play with a lead. How a coach calls his offense and how a quarterback plays with a lead are vastly different in terms of strategy and decision making than when they are behind in a game.

¹³ Interview: Brian Hill Los Angeles Rams Scout

On the offensive side of the football, the Rams added key weapons on the perimeter to help Jared Goff in the passing game. The Rams added former Patriot Brandon Cooks and former Chief Sammy Watkins Jr. Since the additions, Goff sits at 4th (3,754 yards) in passing yards through week 14 of the 2018 regular season and Todd Gurley leads the NFL in rushing (1175) yards (NFL Next Gen, 2018). Similar to Seattle's model, Gurley averages 5 yards a carry, creating favorable situations for Jared Goff and the Rams offense to attempt higher percentage throws of 10 or less yards.

While this “Win-Now” strategy is still relatively young and remains to be untested, it is certainly not intended to be a long-term plan The Rams will likely have to pay, trade, or release these players in the near future. However, their goal was never to keep these players long term, but rather rent them to support their core talent such as Jared Goff and, at the time, Russell Wilson.¹⁴ Since, Wilson's signing in 2015 and the mass exodus of players in Seattle has caused the Seahawks to revamp their roster and essentially start from scratch. However, Russell Wilson is now a 2018 MVP candidate and has carried the Seahawks over the last two seasons. The earlier support he received in his first three seasons has elevated him and allowed him to become a refined NFL quarterback. Much like Seattle, LA will continue to support Goff with surrounding talent with the hopes that he will develop into an all-time great once the talent leaves around him.

The key component in this model is the development of a young franchise quarterback that is under the rookie cap and the surrounding support on both sides of the football to further his development.¹⁵ Teams in the past have attempted to build a “superstar team” but have failed due to massive quarterback contracts or believing that the development of the quarterback is not

¹⁴ Interview: Brian Hill - Los Angeles Rams Scout

¹⁵ Interview: Pat O'Hara – Tennessee Titans Quarterback's Coach

as important. The 2011 Philadelphia Eagles attempted to build a “dream team” in 2011 under the direction of head coach Andy Reid. The problem: Reid’s quarterbacks consisted of a 31 year old Michael Vick and a 1st round cast off in Vince Young. The team was never able to develop a young quarterback into the system that was in place and instead took older quarterbacks. The Eagles finished 8-8, failed to make the post-season and head coach Andy Reid was fired.

As of week 14 in the 2018 season, every division leading quarterback is on their rookie deal with the exception of the Pittsburgh Steelers, New England Patriots, and New Orleans Saints (Figure 4 & 5). This method will need reevaluation in the coming years.

b. A Youth Movement

To understand why football in its entirety has changed over the last 10 years, one must look at the grassroots programs around the country. The art of tackling, throwing, catching, and rules are taught to children as young as 4 years old. However there has been a narrative shift in the last five years. With the discovery of Chronic Traumatic Encephalopathy (CTE), the number of youth tackle football participants has drastically taken a hit.

In a study done the Boston University School of Medicine and the VA Boston Healthcare System, scientist researched the brains of 246 football players. The results of their study showed that 211 of them had the neurodegenerative brain disease known as CTE. CTE is defined as a degenerative brain disease found in athletes, military veterans, and others with a history of repetitive brain trauma (Christine M. Baugh & Julie M. Stamm & David O. Riley & Brandon E. Gavett & Martha E. Shenton & Alexander Lin & Christopher J. Nowinski & Robert C. Cantu & Ann C. McKee & Robert A. Stern, 2012)

They also concluded that athletes who begin playing full-contact football before the age of 12 increase their risk of CTE and suggested that athletes who want to participate in contact football should not until the high school level (McKee, 2018). According to Sports & Fitness Industry Association, the number of youth football participants between the ages of 6-12 fell from 1,262,000 in 2015 from 1,217,000 participants in 2016 (King, 2017).

The desire to play football is still there for young Americans.¹⁶ The NFL is the most popular sport in the United States and young aspiring athletes and want to be like their role models and have a way of doing so; flag football. Flag Football is consists of seven players against seven players and is non-contact. Players must pull each other's flag to "tackle" them. As youth tackle football participation falls, flag football participation has increased by 29% since 2014 (King, 2017).

A similar situation has occurred with other youth sports organizations in the United States. The U.S. Soccer Federation has banned heading the soccer ball for players under the age of 10 and limited the amount of headers for players between the ages of 11-13. USA hockey has banned body-checking until the age of 13 (Farrey, 2018).

Flag football offers young athletes the ability to play football and continue to improve their skills without the increased risk that tackle football offers. With that comes the advanced development of the quarterback position. Flag football's origins can be traced back to a form of practice used in tackle football called seven-on-seven. Seven-on-seven is a drill used by teams to work on the passing and pass defense aspect of the game. There is no pass rush or offensive line and is used as tool to help quarterbacks read defenses and understand positioning and alignments without their vision being obscured by a 6'6 320lb offensive tackle. Seven-on-seven has evolved

¹⁶Lawrence, Andrew. "We Wouldn't Let Kids Ride a Bike Without a Helmet. So Why Do We Let Them Play Football?" Men's Health. July 10, 2018.

into essentially its own sport. High school programs from around the country compete in summer leagues against one another for prizes and to build team chemistry (Spitler, 2013). These leagues are especially growing in popularity in warm weather states such as California, Florida, and Texas where football is played year-round.

With the rise of flag football, individual football camps, and televised skill competitions such as the Nike Elite 11, quarterbacks are being forced to throw the ball and understand defensive concepts at a younger age. The demand for starting young quarterbacks is blossoming to every level. Since 2008, (Figure. 6) over 100 true freshman quarterbacks have started at 65 Power 5 conference programs (Dellenger, 2018). The 2017 Division 1 National Championship between the Alabama Crimson Tide and the Georgia Bulldogs involved two true freshman quarterbacks in Tua Tagovailoa (Alabama) and Jake Fromm (Georgia).¹⁷ Barton Simmons of 247sports.com said in an interview with Sports Illustrated "...the bottom line is that when they get to college, they're just more experienced."¹⁸ The transition has made its way into the NFL as well. Some the best rookie season in NFL history have occurred in the last 10 years. These include the likes of Cam Newton, Russell Wilson, Robert Griffin III, Dak Prescott, Andrew Luck and others.

Colleges are now throwing the football at astronomical rates now. Conferences such as the Big 12 throw the football as if their lives depended on it. In a 2016 game between Texas Tech and Oklahoma, current Chiefs Patrick Mahomes II's squared off against current Browns quarterback Baker Mayfield in a shootout that would much more resemble a basketball score than a football one. Mayfield completed 27/36 passes for 545 yards and 7 touchdowns. Mahomes

¹⁷ "Atlanta." College Football Playoff.

¹⁸ "The True Freshman QB Trend Isn't Going Anywhere." SI.com. August 30, 2018

completed 52/88 passes for 734 yards and 5 touchdowns.¹⁹ The combination of statistics from the quarterbacks of both Oklahoma and Texas Tech in their match up in 2006 does not surpass Mayfield's or Mahomes individual statistics from that 2016 match up.

While on field advancements continue to improve, athletes are able to learn how to play the quarterback from the comfort of their home and mobile devices. In 2006, David Graff, Brian Kaiser, and John Wirtz created the video service "Hudl." Hudl is a video service used by 160,000 sports teams to upload and share game tape of their respective sport. Users are able to watch practice/game film from their computers or mobile devices using the Hudl mobile app. Users are also able to create and edit highlight tapes to send out to other coaches or share on their profile. This allows athletes to immediately watch their games or practices whenever they feel fit to (Troha, 2016). Athletes are able to learn on-demand. In years prior to Hudl, athletes had to go to a film room or have a hard copy of a film on either a DVD or VHS.

Hudl is not the only form of technology being used to help the advancement of learning in football. In fact, youth organizations, high school, colleges are looking for other forms of learning. One that the United States military has adapted for training their soldiers; video games. The goal of these simulations is simple. Get as close to physical reality as possible so soldiers will be prepared for real-world situations when they are in combat (Sennersten, 2010). During the war in Afghanistan, the US military used these simulations to mimic war games and fight the battle before actually fighting the battle. Sennersten describes the four ways of learning using simulations in her thesis titled *Model-Based Simulation Training Supporting Military Operational Processes*. The four steps she uses are:

¹⁹ "Oklahoma vs. Texas Tech - Team Statistics - October 22, 2016." ESPN.

***Familiarize** yourself with the skill environment, absorbing knowledge about vocabulary, tools, the people, and/or the equipment involved in applying the skill.*

***Acquire** the skill, being led step by step through the process.*

***Practice** the skill, learning how to generalize from the examples used to apply the skill to other scenarios, but with available assistance and immediate feedback.*

***Validate** the skill, demonstrating mastery in one or more randomly selected scenarios.*

Computer-generated After Action Reviews (AARs) help learners understand the strengths and weaknesses of their performance.. (Sennersten, 2010)

With the advancements in simulations and video games, the line between reality and the fantasy world is being blurred. How the United States military is using video games to train their soldiers, is the same way that football organizations are training their players. The games also help desensitize future soldiers from the horrors of war by seeing it before it happens on the battlefield (Burger, T., Romaniuk, S., 2017)

The popular NFL video game, *Madden*, is being used by players at all levels. In recent years, Madden has developed a game that gets as close to the NFL without actually strapping up the pads and running out of the tunnel on Sundays. Madden uses actual plays from NFL offensive (Figure 7) and defensive playbooks with intelligent. EA Sports developers use input and data gathered from former and current NFL coaches and players to understand play dynamics and player movement within certain plays or abilities (Gaudios, 2017). With the addition of advanced artificial intelligence and actual playbooks, the game is shot from the perspective of a quarterback or the “tight” shot (Figure 8). As a result, quarterbacks playing the

game are able to see the game as they would if they were on the field and diagnose defenses and make on field adjustments as they would in a game.

During plays, players are even able to determine the type of pass they want to throw. Whether it be a touch pass or one that needs to have velocity on it, the player has to have an understanding of the type of pass that needs to be thrown. This translates to real-life football as well. For example, if a receiver is running deep and has a slight lead on the defensive back, the quarterback will want to throw a touch pass and allow the receiver to run under the football to make the catch. Madden gives the opportunity for young players to play the game before stepping out onto the field and playing it for themselves in real life.

c. The College Influence

During a 2015 interview at the NFL Combine in Indianapolis, Arizona Cardinals head coach Bruce Arians was asked what his opinion was on the spread offense and its transition into the pro game. He has this to say:

“Seeing the guys coming out of the systems now where the coach holds a card up, the players line up, he kicks his foot and they play football. “The hardest thing for them is to get into a huddle and call a play. They’re stuttering, they’re stammering, the guys around them don’t believe in them. That’s that leadership thing. That’s the hardest thing for these young quarterbacks who play in these systems...they have to learn how to play quarterback at this level and sometimes that’s overwhelming.”

Arians resigned as head coach the following season the 2017 season after leading the Cardinals to an 8-8 record.²⁰

For years, when a quarterback and a system clashed, the quarterback was the one to go (Lombardi, M., & Belichick, B., 2018). The first trailblazer to look at the college game to influence the pro game was former San Francisco 49ers head coach Bill Walsh. Walsh believed that the “key to success in the passing era of the NFL is to marry the right quarterback with the right system” and that “if you cannot change the player, change the system” (Lombardi, M., & Belichick, B., 2018). As assistant coach with the Cincinnati Bengals in 1970, Walsh was handed a quarterback named Virgil Carter.

Drafted out of BYU, Carter was considered to be under-sized and a having a weak arm. However, Carter was extremely accurate in the short passing game and elusive in the pocket; something that Carter used to set numerous NCAA records and capture the first conference title in school history in 1965. Walsh understood that he could not attack teams vertically but he could stretch teams horizontally with speed and utilizing quick pack games that essentially turned into elongated handoffs. Carter was the first model prototype and the inspiration for Walsh’s West Coast offense which would go on to win 5 Super Bowls with the San Francisco 49ers and is considered the last great innovation in pro football (Lombardi, M., & Belichick, B., 2018)(Walsh, B., Jamison, S., & Walsh, C. 2010).

In 2006, NFL offenses utilized the shotgun formation 19% of the time they lined up. In 2018, NFL offenses are in shotgun 62% of the time. The NFL is constantly evolving. Similar to Silicon Valley, what is popular and ground breaking today may be obsolete by the end of the week. Those that are unwilling to adapt to are often left behind. With the medical advancements

²⁰ Florio, M. (2017, July 17). Bruce Arians is no fan of the spread offense

in player training and nutrition, athletes are bigger, stronger, and faster than they ever have been.²¹ Offensive minds have begun to look at all other levels of football to devise new, creative plays to get the ball into the hands of their most dangerous playmakers and exploit defenses.

An NFL playbook is one of the most difficult transitions as a young player. A player must be able to fully understand the basics of the playbook as well as the audibles, checks, play responsibilities and language and execute it at a high level. Dr. David Redish is a professor in the department of neuroscience at the University of Minnesota. In an article with Sports Illustrated, compared learning an NFL playbook to “trying to play a musical instrument that’s scheming against you.”²²

The human brain is a decision making machine and has a two-system decision making process (Redish, 2015).

System One: The Procedural System: This is the reactive system. It works at a fast rate and does not think of consequences. This system is more of a primitive an instinctual way of decision making or you “gut feeling.” It is a system that thinks of smaller tasks and involves quick decisions. However, this decision making process is prone to mistakes due to lack of fully examining a situation in its entirety. From a football aspect, this could be the decision to throw the ball to the uncovered receiver after seeing a blitzing linebacker.

System Two: The Deliberative System (“Football Smarts”): This system is a slower, more thorough thought process. This thought process takes into consideration all aspects of the decision. It considers the consequences of the pros and cons of the situation by understanding the

²¹ Loria, Kevin. "People Are Stronger and Faster than Ever Before, but the Reason Why Isn't What You Think." Business Insider. August 04, 2016.

²² Treadway, D. (2014, August 4). Brain Games: A top neuroscientist explains how difficult it is to master an NFL roadway, 20914.

severity of the decision. This decision should be thoughtful and require effort. In football, this decision is used to understand the operations and language of the offense.

The key for an NFL player, specifically a quarterback, is to use both systems in perfect synchronization and at a high level of performance. Using this thought process, the quarterback position can be broken up into two ways of thinking; Pre-snap and post-snap.

Pre-snap is before the play is initiated. The system that is used in this part is the deliberative system. It is during this time (40 seconds between each play) that the quarterback must interpret the play that is being relayed from his coach to him via the headset in the player's helmet or hand signals given by sideline personnel. He then must effectively tell the other players the play while understanding it himself as well. Once at the line of scrimmage, the quarterback must analyze the defense that is presented to him. He must be aware of any coverages, blitzes, stunts and whether the play that is called will be effective against the defense in front of him. If it is not, the quarterback must determine what play call is best vs the defense and effectively communicate the new call to the rest of his teammates. Once this is communicated, he must confirm that all other players are in their correct alignments. He then snaps the balls.

Once the ball is snapped, or post-snap, the quarterback must now flip his thought processing system to the first system, the procedural system. The average NFL play lasts approximately 4 seconds, meaning the quarterback has a very short time frame to make the proper decision when passing the football. Then using the information the quarterback in his post-snap thought process, he must now react to what the defense is doing. He must react to the surrounding pass rush as well and may include changing his launch point to evade a defender and deliver a catchable pass to his receiver. While evading the rush, he must also be able to keep his

eyes down field and react to what the defenders are doing. He must then quickly decide what receiver to throw to depending upon the positioning of his receiver and the defender. He must also determine the type of pass that needs to be thrown by the positioning and the type of route.

The best quarterbacks in the NFL are able to do this and every play and are effective in using both thought process. Tom Brady is widely considered to be the greatest quarterback of all time. With the most Super Bowl wins of any NFL quarterback in history, it is a difficult statement to contest. Despite being 41 years old, Brady was the 2017 NFL MVP and continues to play at a high level through 2018. In an interview with Peter King, Brady described what it is like to play in the NFL as having “all the answers to the test.” He went on to say that he could not be fooled anymore because he has seen every defense. Brady has started in 265 games through 17 years since entering the league in 2000 (Pro Football Reference, 2018). The same could be said for New Orleans Saints quarterback Drew Brees and former Indianapolis Colts/Denver Broncos quarterback Peyton Manning who were all surgeons during the pre-snap and post-snap process.

However, not every team is able to draft a Brees, Manning, or Brady (especially not in the 6th round). So how are teams able to develop quarterbacks into understanding a playbook and using the two-system decision making processes at a high level? Simplification.

Head coaches and offensive play callers look to simplify the game for their quarterbacks and take on the burden of many of the deliberative system aspects of quarterbacking. One example that has exploded onto the NFL scene is one that has its figure prints all over college and high school football; the Run-Pass Option (RPO).²³ An RPO is a play designed for the quarterback to either keep the football and throw it, or give the football to the running back.

²³ Kilgore, Adam. "The RPO Was Born in High School and Took over College. Now It's the NFL's Favorite Play." The Washington Post. August 16, 2018.

Essentially, two plays in one. The RPO is rooted from college football offenses that utilized the shotgun formation to allow the quarterback to be a threat to throw, as well run. The design takes the overall deliberative system thinking for the quarterback. Rather than identifying an entire defense, he is instructed to read one defender and solely react off of his movement. This type of play but a defense in a bind and can cause major issues. If the defender chases the run, the quarterback is instructed to throw the ball. If the defender runs towards the receiver, he is instructed to give the ball to the running back. The Philadelphia Eagles “RPO’ed” their way to a Super Bowl Championship. After a season ending injury to Carson Wentz, back up Nick Foles was thrust into the starting role. Foles, a former University stand-out, was originally drafted by the Philadelphia Eagles under the direction of Chip Kelly and then-quarterback coach Doug Peterson. Kelly brought his spread style of offense from the University of Oregon. Foles fit Kelly’s spread style of play but was limited in running. Due to this, Kelly implemented the RPO, a system that was a staple of the Ducks offense. Under Kelly, Foles posted 25 TD’s and only 2 INT’s in 2013. After being traded to the Rams and Chiefs, Foles returned to the Eagles. Now head coach Doug Peterson recognized this talent, and implemented Oregon’s college style of play that led to his success during his prior stint with the team. During the 2017 season, NFL teams averaged 4.6 yards per carry on RPO runs. Teams averaged 3.6 yards per carry on non-RPO runs (Kilgore, 2018). The RPO allows coaches to be the deliberative system and the quarterback to be the procedural system and takes an immense amount of pressure off of a young quarterback.

Another aspect of college football that has leaked into the NFL is the use college -style formations, motions, deceptions and spacing concepts to create confusion on the side of the defense. These shifts and jet motions are used to draw defenders out from the middle of the field,

allowing for cleaner passing lanes. NFL coaches are using “mesh” concepts to create high percentage throws and get the ball into the hands of their playmakers before the defense can react.

In 2017, NFL quarterbacks averaged a total Quarterback Rating (QBR) of 90 on passes of over the middle of the field; an increase from a QBR of 88 in 2016. NFL offenses averaged using Jet motions 1.7% of the time during the 2016 season. That average bumped to 2.3% in 2017. The Los Angeles Rams had the highest percentage of jet sweep use in 2017 with an 8.3% use. Rams quarterback, Jared Goff posted the highest QBR for passes of the middle of the field in 2017 with a rating of 109.

Play schematics are not the only shift that has evolved. Learning a play book is often compared to learning a new language. A popular approach that college teams have used is through linguistics. One of the more popular forms of learning a new language is through word association. Word association falls under two categories: syntagmatic and paradigmatic. Syntagmatic associations are responses which form an on definitive link with the stimulus word. Paradigmatic associations are responses which form from the same grammatical class as the stimulant (Meara, 2009).

The same format is used when creating the language for an offensive playbook by college football coaches using both forms of association. In many college systems, a player must associate one word with one play, one formation, one motion, and one shift. This works as syntagmatic association. A player must learn the audibles as well using code names affiliated with the original code word. For example, the call for a fake snap count may be the word “freeze.” To keep a defense off balance, any word that is associated the anything “cold” is will

mean the same thing as a “freeze” call (ex. cold, Alaska, ice, penguin, etc.). This would be considered paradigmatic.

Oakland Raiders head coach Jon Gruden is known for pushing the intellectual limits of his players. In his complex West Coast offense, a play call might sound like a language devised by an alien race. A play call made famous by Gruden during his ESPN show *Gruden's QB: Camp*, due to its exotic name was “Spider 2 Y Banana.”²⁴ The entire play call is “Green Right Strong Slot Spider 2 Y Banana.” The play is broken down by formation, motion, protection and play. However in a college offense, that same play is can be called using one-word calls to identify what the word means and is associated with. (Figure. 9) An example the exact same play in a college offense may be called “Slot Right Rhino Dolphin.” While the format of the college play is still the same as the NFL, the word association with each aspect uses the syntagmatic form of association. The protection is also given an “R” or “L” in each code word to signify the direction of the play (Lake/River, Wolf/Shark, and Nirvana/Metallica). The player associates the word “Rhino/Elephant”, with the form of protection, as well as the direction, and “Dolphin” with the specific play, rather than hearing the tag of each player such as ‘Y Banana.’ This also assists with audibles as a play could be changed by species of animal or city associated with the original word.

On an edition of *NFL Films: Mic'ed Up*, Los Angeles Rams head coach Sean McVay can be heard uttering 3 word play class into Jared Goff's headsets such as “Hale Barry.”²⁵ “Hale Barry” is what the play is called but it is the formation, motion, and play in one word.

²⁴ Ahmed, Jobeyer. "What the Heck Is Spider 2 Y Banana?" The Raider Ramble. January 03, 2018.

²⁵ Joseph, Andrew. "Halle Berry Had Question for Jared Goff's 'Halle Berry' Audible Call." USA Today. September 12, 2018

In the NFL, the speaker inside the quarterback's helmet automatically shuts off with 15 seconds left on the play clock. With the play calls being short, it allows for quick communication to the rest of the team and McVay can still communicate to Goff while at the line of scrimmage.

Similar to having you conscious speak to you, except it's the head football coach.

d. Rule Changes

Following the discovery of CTE in 2005, the NFL has implemented over 20 rule changes in regards to player safety. Some of these rules include: defenders are forbidden to hit a quarterback below the knees (2006), the creation of the concussion protocol (2009), the elimination of the blind side block (2009), unnecessary roughness; hit to the head or neck area (2010), the extension of the roughing the passer foul (2018). The majority of player safety rules are implemented to keep offensive players safe. Some have come as cautionary rules while other have been created as a result of some of the game's most influential signal callers being sidelined with season ending injuries. With the increased emphasis on player safety, defenses have been put at logistical disadvantage. Defenders are no longer allowed to have contact with a defender after 5 yards into a passing route, all helmet-to-helmet collisions are unnecessary roughness fouls on the defender, pass interference penalties are spot follows and the ball will be placed at where the foul occurred, the quarterback cannot be hit above the neck, below the knees or driven into the ground.

There are three major rule changes that have changed the way defenses play and has opened up the game for offenses.

The Carson Palmer/Tom Brady Rule (2006/2009): "A rushing defender is prohibited from forcibly hitting in the knee area or below a passer who has one or both feet on the ground,

even if the initial contact is above the knee. It is not a foul if the defender is blocked (or fouled) into the passer and has no opportunity to avoid him (NFL, 2009).

In 2006, Cincinnati Bengals quarterback Carson Palmer suffered season ending knee injury that required the repair of the anterior cruciate ligament (ACL) in his left knee during a Wild Card playoff game against the Pittsburgh Steelers. While battling a blocker, Steelers defensive lineman Kimo Von Oelhoffen fell into the left knee of Palmer and injuring him.

Following its initial creation in 2006, the rule was reemphasized by the National Football League in 2009 after New England Patriots quarterback Tom Brady was hit during the second week of the 2008 season by a Kansas City Chiefs defender that was lunging for his legs while on the ground. Brady missed the entire 2008 season with a torn ACL.

Hit on a Defenseless Player/Targeting (2010/2018): It is an illegal hit on a defenseless receiver if the initial force of the contact by the defender's helmet, forearm or shoulder is to the head or neck area of the receiver (expanded to WR's, Kickers/Punters, Quarterbacks in 2013). It is a foul if a player lowers his head to initiate and make contact with his helmet against an opponent. It is a penalty that will result in the loss of 15 yards. If the foul is by the defense, it is also an automatic first down. The player may be disqualified (2018). (NFL, 2011)(NFL, 2018).

These rules protect quarterbacks and pass catchers from large collisions with defensive players while the receiving player or quarterback is in a defenseless state. The rule is set in place to reduce serious and catastrophic injuries. Players such as Willis McGahee, Reggie Bush, and Joshua Cribbs suffered major concussions due to these hits.

The Aaron Rogers Rule (2018): A rushing defender is prohibited from committing such intimidating and punishing acts as 'stuffing' a passer into the ground or unnecessarily wrestling

or driving him down after the passer has thrown the ball, even if the rusher makes his initial contact with the passer within the one-step limitation provided for in (a) above. When tackling a passer who is in a defenseless posture (e.g., during or just after throwing a pass), a defensive player must not unnecessarily or violently throw him down or land on top of him with all or most of the defender's weight (NFL, 2018)

In a 2018 divisional game between the Green Bay Packers and the Minnesota Vikings, Packers quarterback Aaron Rodgers scrambled out of the pocket. Following the throw, Vikings linebacker Anthony Barr tackled Rodgers and used his force to drive Rodgers into the ground. As a result, Rodgers suffered a broken collarbone and missed the remainder of the regular season.

All three of these rules changes have impacted the passing game in the NFL. Since 2009, nearly every passing category average has risen with the exception of average attempts. The average completion percentage in the NFL showed a 5% increase from 60.9% to 65.1%. The average number of touchdowns has increased from 1.4% to 1.7%. The interception percentage fell from 3.1% to 2.4%. The passing yards per game increased from 218.5 to 243.6. (Pro Football Reference, 2018).

On the defensive side of the football, from 2009-2017, penalties such as defensive pass interference, roughing the passer, defensive holding, and unnecessary roughness have all increased steadily (Figure. 10). The increase in rules allows offenses to exploit defenses vertically down the field with the mindset of possibly drawing a penalty. In the NFL, a defensive pass interference foul is a spot foul. Meaning the ball is placed at where the foul occurred. A defensive pass interference foul can be breaking to a defense. While some fouls are only 5-10 yard foul defensive pass inference could cost a team a massive amount of yards, depending on how far the ball was thrown and where the foul occurred. Since 2009, defensive pass interference

calls have increased by 70%, roughing the passer increased by 64%, unnecessary roughness fouls increased 62%, and defensive holding increased by 43%.

As a result to the rule changes, quarterbacks are able to stand more freely in the pocket and are far more protected by officials. This also causes defenders to be more hesitant when hitting the quarterback due to fear of inflicting a 15 yard penalty. The targeting rules have also had an impact on the receivers and the secondary.

Prior to the rules, wide receivers feared middle of the field enforcers such as Ronnie Lott, Steve Atwater, and Ed Reed let their presence known with big collisions. Former Baltimore Colts receiver Raymond Berry compared crossing the middle of the field prior to the new rules as “serious automobile accident” (Plimpton, 2016).

Since the implementation of the rule, teams have increased the use of crossing routes and route over the middle of the field as a result of defenders not being allowed to impose their will. With quarterbacks becoming virtually untouchable and receivers being protected, the NFL is trending towards a seven-on-seven style of play and allowing large passing lanes for quarterbacks to through. The number of “wide-open” (3 yards of separation or more) passes with 3 or more yards of separation is up to 42% this year. In 2017, that number was at 39%. The number of “tight-window” throws (one yard of separation) is currently at 15.7 %. In 2017, that figure was at 17%.

2. Analysis

a. The Rookie Salary Cap

Statistical analysis and trends from three successful NFL franchises since the creation of the CBA would suggest that the NFL is beginning to trend in this direction. This theory proved

to be the strongest method that was used. While this model may not be able to sustain long term success, it has shown to have an impact on the development of young starting quarterbacks. Two out of the three teams, the Philadelphia Eagles and Seattle Seahawks, have used this model have produced Super Bowl championships. The third team, the Los Angeles Rams, are currently in the process of completing their regular season and lead their division. The Rams success will need to be reevaluated at the conclusion of the season. Brian Hill is a college scout with the Los Angeles Rams confirmed that they are implementing this model. “We’re in the 2-3 year window. Once you start paying guys like Aaron Donald, you’ll have to let go some good players and that’s when teams can slowly fall apart. That makes the draft more important. But that is the model now, started by Seattle then Philly, now us and the Chiefs.”

However, the data from this section could be used by franchises in the future and alter their motives during the NFL draft process and in free agency. A team with large amounts of salary cap space and a young franchise quarterback, such as the New York Jets, could be inclined to enter free agency as large buyers and be more inclined to sign a big name such as Le’veon Bell. In the last three models, a strong running game would suggest that a formidable running attack will help create ideal situation for a young quarterback in the NFL and increase their chances of success in the passing game with high percentage throws on favorable downs.

While this model needs to be tested over the course of several years, the preliminary results suggest a correlation between the rapid development of young quarterbacks and the use of the rookie salary cap to build a stable and strong roster.

b. Youth Movement

A variety of strategies were used to access how youth football is evolving over time. NFL quarterbacks such as Goff, Wilson, and Wentz are truly the first quarterbacks to enter out of the

seven-on-seven era. With the NFL adapting to more college concepts, these players are now prepared for the next level now more than in years prior.

Statistics of participation in the last 5 years has fallen in youth tackle football. On the contrary, flag football number have increased between the ages of 6-12. These analytics suggests a trend that young athletes are making the switch from tackle football, to flag to avoid catastrophic or traumatic head injury.

The study of how this will impact football will need to be assessed over the next 10 years as well as the fundamental changes that will occur to that time. The first results of this study suggests that quarterbacks are becoming college starters at a younger age at Power 5 programs. It will be interesting to see if this trend continues over the next several years.

In terms of video games and their impact on the sport, it too, will also need further evaluation. In other fields, such as the military, simulations and video games have helped the mental learning process of individuals and allowed them to be more prepare for real life situations and circumstances. Whether Madden does this or not will need to be further studied. The trends and data in other fields suggest that it could. However, there is no conclusive evidence of Madden attributing to the development of young quarterbacks in the NFL.

c. College Influence

The college influence turned the second strongest method. This method used on-field strategy comparison and the thought processes and learning habits of NFL quarterbacks. This method suggests that NFL coaches are reaching back into college playbooks to assist their quarterbacks with in game decisions and playbook interpretation.

Data from the last five years showed that college quarterbacks are throwing more than they have in years prior. This offers quarterbacks to gain more experience by simply playing and throwing more, allowing for trial-by-fire approach to the quarterback position.

By understanding the thought processes of the human brain, this method was able to determine how a player thinks and what needs to happen to be a successful quarterback. The example of the RPO, failed to support decision making process and proved to be a reliable and productive play in the NFL that has been taken from the college ranks. The use of the RPO shows how NFL coaches are taking the “thinking” out of playing the position and allowing the players to play instinctively. Pat O’Hara of the Tennessee Titans emphasized the use of college offenses in the National Football League and their growing impact. “Teams need immediate results earlier in a QB’s careers so teams are trending toward more college schemes offensively.”

Terminology has also been shorten to assimilate to younger quarterbacks and their communication with the rest of the team. The shorter terminology allows quarterbacks to quickly communicate with teammates and more time to assess the defensive strategy during the 40 second period between plays.

d. Rule Changes

Analyzing the rule changes since the 2009 season showed trends of an increase in defensive penalty calls. Likewise, there was an increase in offense statistics. This suggests that offensive play callers are using these rules to their advantage by designing plays that exploit a defense that cannot hold past 5 yards. Analytics shows the amount of “wide-open” receivers has greatly increased throughout the NFL, offering a higher chance of completions for quarterbacks. This methodology proved to show concrete evidence higher completions because of the rule changes.

V. Conclusions

This topic is one that I believe will be explored by NFL teams in the very near future. There is not an exact science to the game of football. It is a game of trial and error and of constant change. The reason for quarterback's success may change every 5 to 10 years and have an entire different strategy. Every team is looking for that generational quarterback to change their franchise. Teams will use whatever means necessary to discover that. I believe the numbers and data in this research will get the ball rolling into taking unique perspectives into taken evaluation and the development of players.

The hypothesis that quarterbacks are playing at a higher level an earlier rate because of the rookie cap, youth movements, college influence, and rule changes was partially proven but needs more analysis over the course of several years.

The rookie cap has in fact changed the strategy of NFL teams. By looking data and first-hand accounts from inside the Eagles and Rams organizations, I can conclude that teams that are following this model have seen their quarterbacks improve due to the talent that has been put around them.

Finding concrete evidence that the changes to youth football are a direct reason for success at the NFL level needs further study. It will likely take an entire new generation of football players to determine the effects of flag football. While players are seeing early success at the college level, there is only a small sample size in the NFL. It will be interesting to see how the freshman QB's in college football now develop and perform at the next level.

The influence of college offenses has in fact assisted in the growth of quarterbacks in the NFL. Because of the demand of success, NFL teams are forced to rely on what players did in college well and bring it to the pro level. This hypothesis was proven by multiple teams,

including the Rams, Seahawks, Bears, and Chiefs. Teams now use college concepts such as the RPO to play into the strengths of their quarterbacks and changes the scope of their thought processes. Like anything in the NFL, this could change. The more that defenses see these college schemes, the more they will be able to prepare for it and the staying power could be in question.

The hypothesis that rule changes have affected the way game is now played was also proven to be true. Teams are throwing the football more than they ever have at both the college and pro levels. Due to the rules involving the defensive secondary, analytics show that receivers are now getting open from a greater margin than they have in previous years, making the throw for the quarterback easier. With that the passing game has no longer become “football in a phone booth” and the margin for an error throw is larger than it has been before.

This paper could give a greater insight look into the blueprint of developing a rookie quarterback in today’s NFL as well as look into the future of NFL prospects by evaluating the trends at the youth and high school levels.

The strengths of this project were certainly the amount of resources that were able to be obtained through NFL sources. For this research paper alone, over 10 NFL scouts were used as references; including scouts from the Rams, Seahawks, and all of which were mentioned heavily in this paper. Also, gathering and creating analytical data faired to be simpler than previously thought. Sites such as Next Gen stats and Pro Football Reference were major influences in this research. From there, I was able to piece together other pieces of data to support my hypothesis.

A major weakness in the study was the uniqueness of the study. There is not a substantial amount of other data in this field. The research for this thesis needed to be pulled from multiple areas and heavily analytics based to conjure up correlations. Academic journals for this paper needed to be drawn from fields such as the medical and psychological fields.

The new knowledge gained in this paper could prompt teams to take a more analytical approach to their team building and strategies for the NFL draft.

In the future, it can be suggested that teams will begin to adopt the method that the Seahawks, Rams, and Eagles have. There will also be a bigger emphasis on the NFL draft and teams will begin to look at quality over quantity of picks. Depending on the staying power, the future of offensive football could change entirely. Rather than the quarterback be used to only pass, there could be a shift in the definition of what it means to be a quarterback. The position could be turned into another skill position and be used the same way that the Wing T once used the quarterback.

In summary, NFL quarterbacks are becoming successful at a faster rate primarily due to the change in the rookie cap, the influence of college offenses and the changes to the rules. While the youth football has begun to change, it is too early to determine its impact on the NFL.

Illustrations

Figure 1.

Base Salary Cap: \$178,000,000					
Team	Cap Space	Effective Cap Space	#	Active Cap Spending	Dead Money
49ers	\$115,965,793	\$115,965,793	52	\$102,365,529	\$15,048,902
Browns	\$111,409,592	\$111,409,592	55	\$115,507,916	\$10,274,802
Colts	\$83,677,477	\$83,677,477	52	\$110,298,384	\$1,800,217
Jets	\$80,931,976	\$76,131,976	41	\$111,816,136	\$2,918,337
M Buccaneers	\$66,120,552	\$63,720,552	46	\$127,624,699	\$814,506
Vikings	\$57,039,809	\$52,239,809	41	\$133,638,744	\$654,816
Titans	\$54,489,041	\$52,089,041	46	\$153,655,263	\$551,413
Redskins	\$53,956,714	\$53,956,714	53	\$125,566,150	\$500,950
Texans	\$53,832,683	\$53,832,683	51	\$134,805,659	\$390,033
Lions	\$53,713,605	\$48,433,605	40	\$122,372,707	\$6,436,899
Rams	\$51,470,597	\$46,190,597	40	\$130,911,446	\$431,754
Bears	\$47,862,578	\$44,022,578	43	\$137,372,407	\$1,233,381
Packers	\$41,808,091	\$37,008,091	41	\$141,396,259	\$4,718,533
Bills	\$40,809,646	\$34,089,646	37	\$130,795,590	\$18,719,288
Bengals	\$37,930,833	\$37,930,833	54	\$150,605,383	\$632,363
Saints	\$34,526,817	\$33,086,817	48	\$137,573,709	\$6,965,970
Broncos	\$29,413,403	\$27,013,403	46	\$158,247,174	\$365,907
Giants	\$28,912,197	\$26,512,197	46	\$150,522,029	\$478,255
Chargers	\$28,751,465	\$25,391,465	44	\$147,472,722	\$4,723,657
Panthers	\$25,068,957	\$21,708,957	44	\$155,103,719	\$2,371,254
Cowboys	\$23,481,370	\$20,121,370	44	\$149,159,215	\$13,711,112
Raiders	\$21,145,822	\$17,305,822	43	\$163,123,776	\$2,018,441
Seahawks	\$19,415,048	\$12,695,048	37	\$154,732,596	\$4,012,715
Cardinals	\$18,827,823	\$13,547,823	40	\$161,686,484	\$673,489
Jaguars	\$18,101,386	\$18,101,386	51	\$187,022,042	\$644,803
Patriots	\$17,167,179	\$17,167,179	52	\$163,491,689	\$965,423
Falcons	\$15,462,827	\$10,662,827	41	\$160,884,742	\$2,378,535
Dolphins	\$15,410,140	\$11,570,140	43	\$163,084,438	\$276,688
Ravens	\$12,340,437	\$11,860,437	50	\$166,568,718	\$2,333,338
Steelers	\$3,010,677	(\$2,749,323)	39	\$178,386,911	\$956,175
Chiefs	(\$4,279,469)	(\$6,679,469)	46	\$180,109,232	\$5,806,923
Eagles	(\$4,676,904)	(\$5,156,904)	50	\$184,466,677	\$486,941

Figure 1. 2018 NFL Salary Cap Room
Source: SPOTRAC.com

Figure 2.

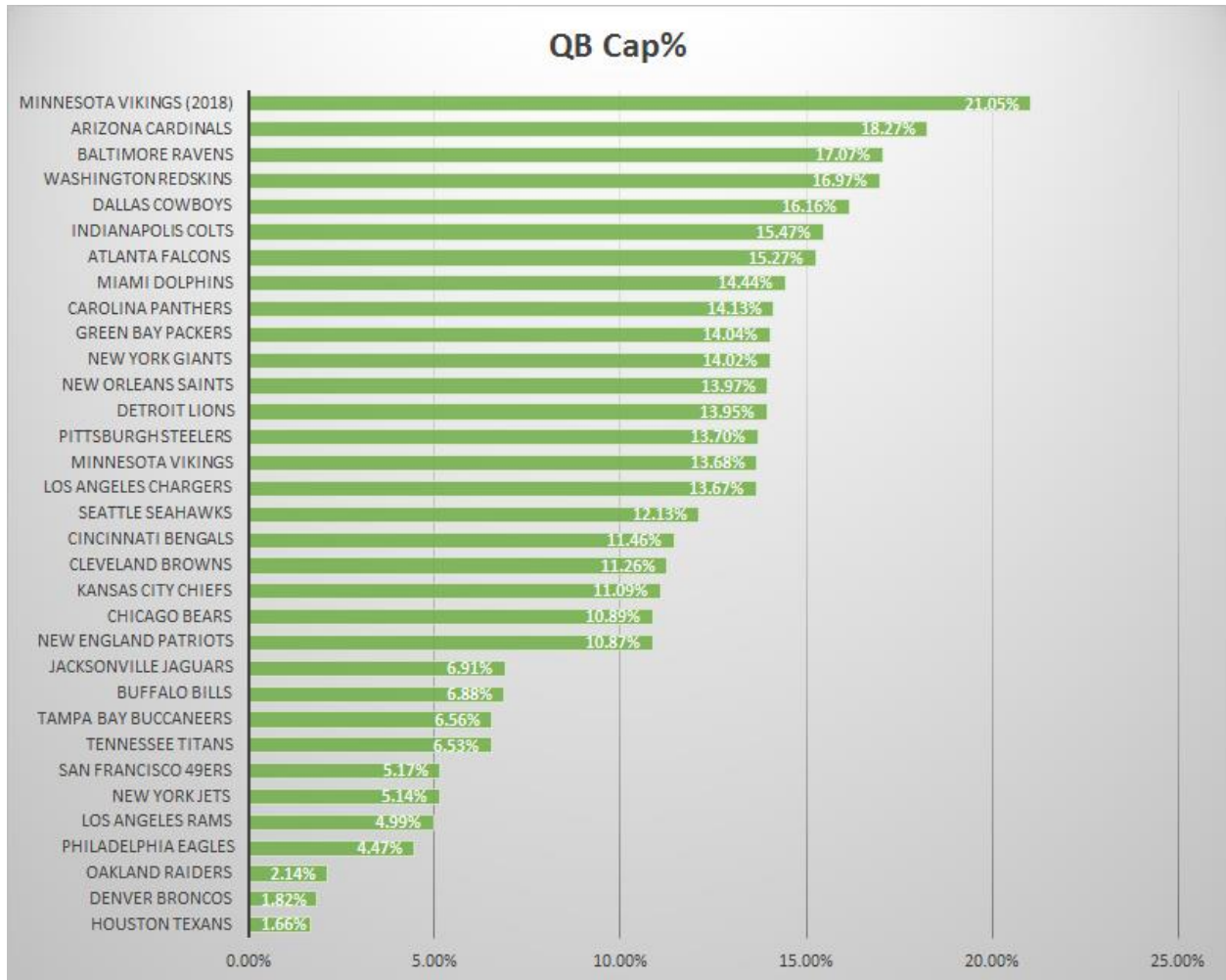


Figure 2. Salary Cap hit by the Quarterback Position by team

Figure 3.

Yrs.	2017	2018	2019	2020
0	\$465,000	\$480,000	\$495,000	\$510,000
1	\$540,000	\$555,000	\$570,000	\$585,000
2	\$615,000	\$630,000	\$645,000	\$660,000
3	\$690,000	\$705,000	\$720,000	\$735,000
4-6	\$775,000	\$790,000	\$805,000	\$820,000
7-9	\$900,000	\$915,000	\$930,000	\$945,000
10+	\$1,000,000	\$1,015,000	\$1,030,000	\$1,045,000

Figure 3. 2017-2020 NFL Minimum Salaries by Years of Experience
Source: SPOTRAC.com

Figure 4.

Tm	W	L	T	W-L%	PF	PA	PD	MoV	SoS	SRS	OSRS	DSRS
AFC East												
New England Patriots	9	3	0	.750	331	259	72	6.0	-1.2	4.8	3.2	1.6
Miami Dolphins	6	6	0	.500	244	300	-56	-4.7	-2.4	-7.1	-5.0	-2.1
Buffalo Bills	4	8	0	.333	178	293	-115	-9.6	1.1	-8.5	-7.9	-0.6
New York Jets	3	9	0	.250	243	307	-64	-5.3	-1.6	-7.0	-3.0	-4.0
AFC North												
Pittsburgh Steelers	7	4	1	.625	346	282	64	5.3	1.4	6.7	5.7	1.1
Baltimore Ravens	7	5	0	.583	297	214	83	6.9	-0.2	6.7	0.3	6.4
Cincinnati Bengals	5	7	0	.417	286	371	-85	-7.1	2.3	-4.7	0.0	-4.8
Cleveland Browns	4	7	1	.375	266	312	-46	-3.8	2.3	-1.6	-2.6	1.1
AFC South												
Houston Texans	9	3	0	.750	302	235	67	5.6	-1.4	4.2	2.6	1.6
Tennessee Titans	7	6	0	.538	251	254	-3	-0.2	-0.1	-0.3	-3.2	2.9
Indianapolis Colts	6	6	0	.500	325	279	46	3.8	-3.4	0.4	3.2	-2.8
Jacksonville Jaguars	4	9	0	.308	212	273	-61	-4.7	0.4	-4.3	-7.7	3.4
AFC West												
Kansas City Chiefs	10	2	0	.833	444	327	117	9.8	0.3	10.0	13.8	-3.8
Los Angeles Chargers	9	3	0	.750	340	249	91	7.6	-0.9	6.7	3.9	2.8
Denver Broncos	6	6	0	.500	276	262	14	1.2	2.4	3.6	-1.5	5.1
Oakland Raiders	2	10	0	.167	220	367	-147	-12.3	2.1	-10.2	-4.9	-5.3

Figure 4. – AFC Standings as of Week 14; 2018

Source: NFL.com

Figure 5.

Tm	W	L	T	W-L%	PF	PA	PD	MoV	SoS	SRS	OSRS	DSRS
NFC East												
Dallas Cowboys	7	5	0	.583	247	223	24	2.0	0.2	2.2	-2.5	4.6
Washington Redskins	6	6	0	.500	233	257	-24	-2.0	0.0	-2.0	-4.7	2.7
Philadelphia Eagles	6	6	0	.500	258	266	-8	-0.7	-0.8	-1.4	-2.7	1.2
New York Giants	4	8	0	.333	267	315	-48	-4.0	0.2	-3.8	-1.2	-2.5
NFC North												
Chicago Bears	8	4	0	.667	344	241	103	8.6	-3.3	5.3	3.6	1.7
Minnesota Vikings	6	5	1	.542	275	270	5	0.4	-0.7	-0.3	-1.6	1.3
Green Bay Packers	4	7	1	.375	281	287	-6	-0.5	-1.1	-1.6	-0.3	-1.3
Detroit Lions	4	8	0	.333	254	316	-62	-5.2	0.5	-4.7	-2.8	-1.8
NFC South												
New Orleans Saints	10	2	0	.833	419	269	150	12.5	0.0	12.5	11.0	1.5
Carolina Panthers	6	6	0	.500	304	306	-2	-0.2	-0.2	-0.4	1.2	-1.6
Tampa Bay Buccaneers	5	7	0	.417	318	355	-37	-3.1	0.1	-3.0	2.0	-4.9
Atlanta Falcons	4	8	0	.333	296	333	-37	-3.1	1.5	-1.5	1.1	-2.6
NFC West												
Los Angeles Rams	11	1	0	.917	419	298	121	10.1	0.9	11.0	11.0	-0.1
Seattle Seahawks	7	5	0	.583	319	259	60	5.0	0.9	5.9	2.9	3.0
Arizona Cardinals	3	9	0	.250	175	310	-135	-11.3	1.2	-10.1	-9.4	-0.7
San Francisco 49ers	2	10	0	.167	255	336	-81	-6.8	-0.4	-7.2	-3.6	-3.6

Figure 5. – NFC Divisional Standings as of Week 14; 2018

Source: NFL.com

Figure 6.

P5 teams to start 3+ true freshman QBS		P5 true freshmen starters by conference		
Maryland	6	Conference	Week 1	Overall
Tennessee	4	SEC	0	32
Boston College	4	ACC	3	22
Kentucky	4	Big 10	4	22
Louisville	4	Big 12	3	15
Miami	3	Pac-12	5	14
Texas Tech	3			
Wake Forest	3			
Texas	3			
Michigan	3			
LSU	3			
South Carolina	3			
Texas A&M	3			
Auburn	3			
Baylor	3			

Both tables' numbers were collected from the 2008 season onward.

Figure 6. - Power 5 Starting Quarterbacks since 2008.

Source: Si.com

Figure 7.

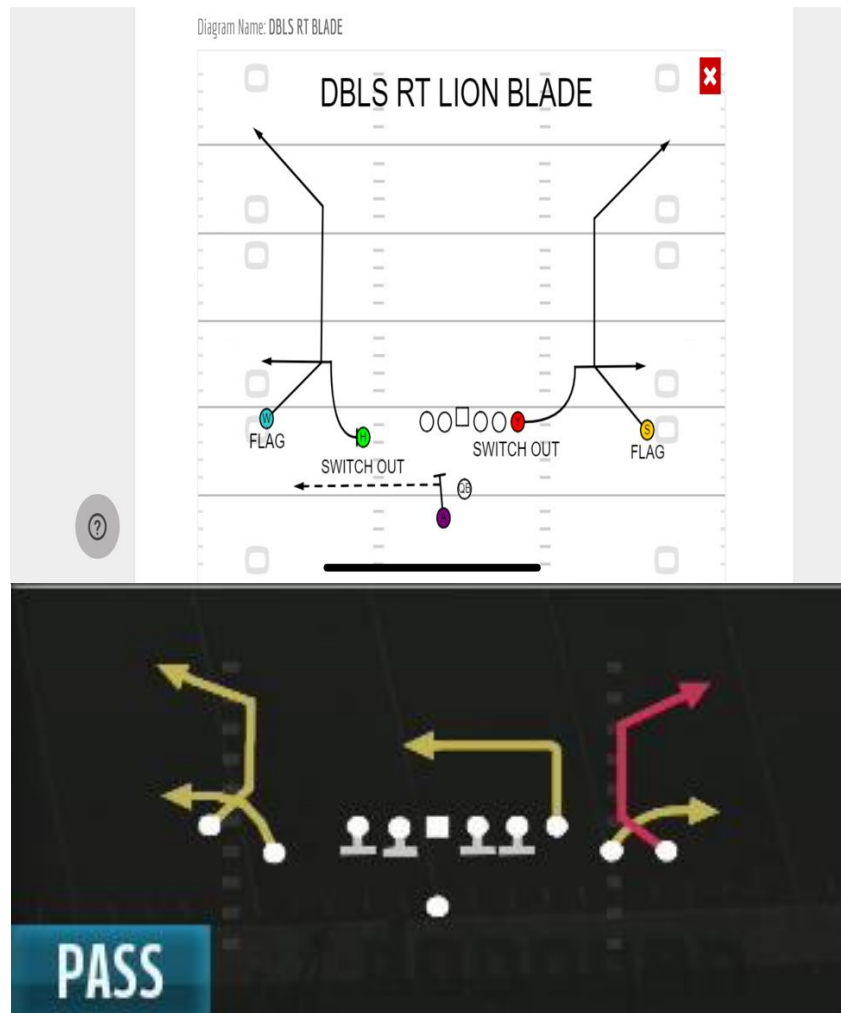


Figure 7. - Madden plays vs. Plays from actual playbooks
 Source: Madden19, Lindenwood Lions football playbook

Figure 8.



Figure 8. - Madden 19 Gameplay
Source: EA Sports Madden 19

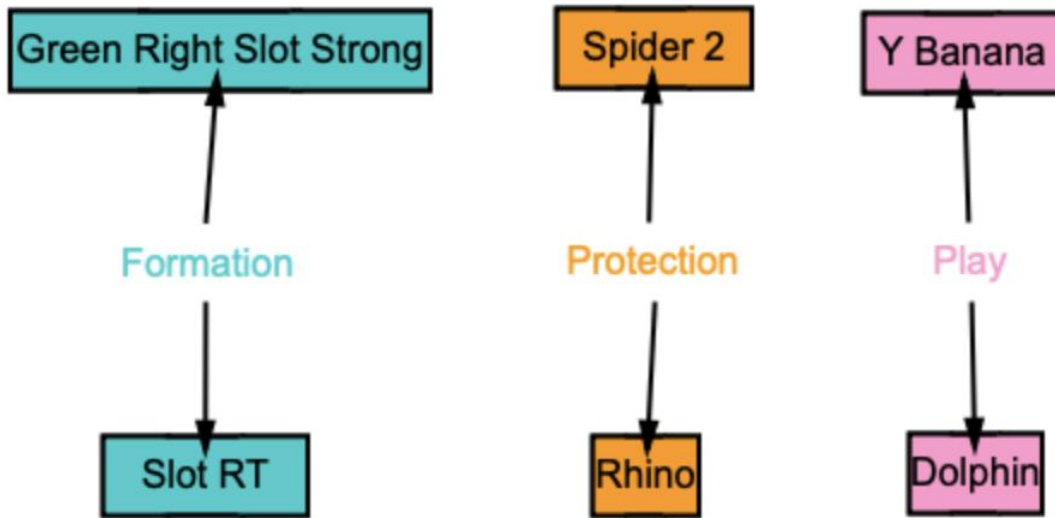
Figure 9.

Figure 9. – Play Call Comparisons NFL (top) vs. College (bottom)
Source: JustPlay Solutions

Figure 10.

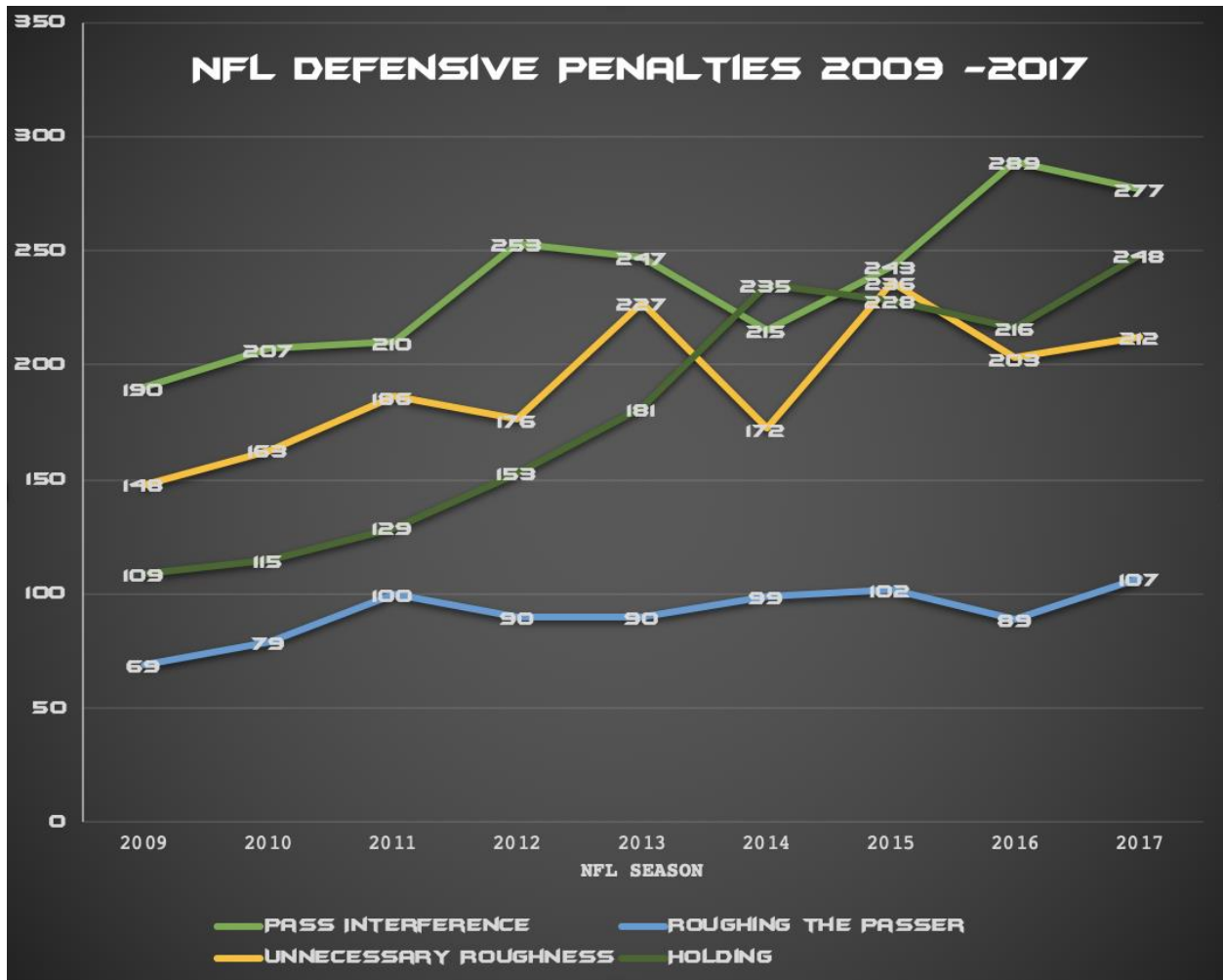


Figure 10. – NFL Defensive Penalties (2009-2017)

Source: nflpenalties.com

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Pat O'Hara – Tennessee Titans (Quarterback coach)

Drew Morris – New York Jets (scout)

Dave McCloughan – Oakland Raiders (scout)

Scott Hamel – Chicago Bears (scout)

Chris Buford – Miami Dolphins (scout)