Winning Numbers: The Defensive Statistics Needed to Win in NCAA Division III Football

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Abstract

The purpose of this study was to investigate the relationship between the importance of specific defensive statistics among the top twenty-five Division III football teams and the bottom twenty-five Division III football teams. The defensive statistics that were analyzed were defensive sacks per game, defensive turnover per game, defensive third down efficiency rating, defensive points allowed per game, defensive fourth down efficiency rating, rushing yards allowed per game, and passing yards allowed per game.

This thesis used a two – sample t-test assuming equal variances to analyze and evaluate the data that was gathered in this study. The wins and losses were not weighted in this study as each team begins the season with zero wins and zero loses. The highest number of wins that a team could have throughout the course of a season in NCAA Division III was and continues to be fifteen. Multiple teams can finish with zero wins but only one team can finish with fifteen wins if any at all. During the 2014 season one team, Wisconsin Whitewater, the Division III National Champion did finish with fifteen wins since they went undefeated. Doing well in a certain defensive category does not guarantee that a team would go undefeated and win all fifteen games. However, what the analysis does support is what defensive statistical categories are more important for winning football games. This thesis found that all defensive statistics are important but specific defensive statistics will determine how successful a football team at the NCAA Division III level will be.

This study found a significant difference in certain defensive statistical categories between Division III football teams with the most wins and those with the least wins. The researcher found that defensive point per game, rushing yards allowed per game, defensive turnovers per game, defensive third down efficiency, defensive sacks per game, and passing yards allowed per game all played pivotal roles in determining if a team was going to win the football game. If a team performs well in these six areas they will have a great opportunity at winning the game. If a team does not perform well in these six areas then they will not have a great opportunity at winning the game.

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Chapter 1

Introduction

Overview

There is a rich history of sports in America and with the use of computer data analysis, the results of these analyses can be exploited by opposing teams. This exploitation has become very prevalent at all levels and types of sports. An example of this analysis is found in the movie Money Ball that was released in 2011 starring Brad Pitt and Jonah Hill. This movie focused on a Major League baseball team, the Oakland Athletics. The Oakland Athletics were portrayed as a small market team that struggled to compete with the larger market teams like the New York Yankees and Boston Red Sox, who spend millions of dollars to bring in the best players in the game. The movie went on to highlight, Billy Beane, the General Manager of the Athletics who used an evidence-based sabermetric approach to assemble a competitive baseball team without all of the big stars that the Yankees or Red Sox employed.

The movie and the aftermath is a great example of using statistical analysis results of baseball player data that was brought into the mainstream of baseball, an icon in American Culture, by the General Manager of the Oakland Athletics. Every other sport, including football, does some type of statistical analysis of data to determine how their team or players rank among the other top teams and players in their league.

According to the Harris Poll, when Americans were asked about which sport is the most popular in the United States, the answer given most often was football. The National Football League (NFL) is the most popular sport venue in the United States followed by professional baseball and then college football. (Harris Poll, 2015).

Last season (2015) was the inaugural season for the College Football Playoffs that featured the four best Division I teams in college football. Entertainment and Sports Programming Network (ESPN) struck a television deal with the National Collegiate Athletic Association (NCAA) for the next twelve years for a price of $7.3 Billion to cover the games (Forbes, 2015). This is a huge payout for the teams and their conferences that make it to the playoffs and then win the National Championship. When looking at the teams that have won the National Championship and their next seasons, their revenue increased eighteen percent from the previous season (Forbes, 2015). Football is becoming a bottom line business and the expected result is to win football games and for new coaches, to win immediately.

Football becoming a bottom line business has been very obvious in the last decade as head coaches and/or assistants have been fired season after season. The old fashion way of a coach getting hired at a school and staying there for the remainder of their career (Joe Paterno at Penn State and Bobby Bowden at Florida State) has been long forgotten. The time given to a new coach to "turn around" a program is now a very short time period (two-three years) or they will be fired.

When a new football coach takes over, he has to hire a new coaching staff. These coaches will be in charge of coordinating the offense, defense, and special teams. When the new head coach is looking at hiring a new defensive or offensive coordinator, the coach will look at the body of work that the candidates have put together. For example, when looking to hire a defensive coordinator, a new coach does not want to hire a candidate whose defense performed poorly. The head coach looks at the defensive statistics (points allowed per game, rushing and passing yards allowed per game,

turnovers, and third down conversion percentage) to make the decision to employ the applicant or look further. There are thousands of coaches who are applying for open college and professional coaching positions and there is only a short amount of time a head coach has to look at the statistics and interview only a select few for each position.

Statement of Problem

With an abundance of coaching candidates available that always apply to fill open positions on a staff, the hiring head coach has to make sure that the candidates being considered are well qualified, a good fit, and will do a great job coaching the football team at the position they were hired to fill. The problem is that there are numerous variables that factor into the success of a particular football unit (offense, defense, or special teams). One of the major statistical categories to analyze when looking at how well a defense performs is how many points per game they are allowing. In today's college football many offenses love to run as many plays as they possibly can and use as many different formations as they can to create missed assignments by the defense. These missed assignments can lead to scoring by the offense thus, points become an important factor.

Other analysis's that must be considered are looking at the coaches own team's offense. Are they a team that has possession of the ball for a majority of the game or are they an offense that is rarely on the field? The longer a defense is on the field, the more tired they will get and the easier it becomes for them to make a mental error that will result in a big play or touchdown for the opposition.

Purpose Statement

By analyzing the defensive statistics of a football team one can determine how successful or how poorly a defense played throughout a particular season or game. However, these defensive statistics can sometimes be misleading. There are sixty minutes in a college football game, broken down into four fifteen minute quarters. Time of possession is important when looking at a defense and their statistics as well as total yards allowed per game. If a defense allows less than three hundred yards of total offense in a game that is typically considered a pretty good game. However, if they are only on the field for twenty minutes that means that they got "picked apart" by the offense. If, on the other hand, they give up less than three hundred yards in a game and they are on the field for nearly forty minutes that means they were playing dominate defensive football.

This study analyzed the defensive statistics of the top twenty-five teams and the bottom twenty-five teams in the NCAA Division III from the 2014 football season. This study compared the total wins of the top twenty-five defensive statistic teams to the total wins of bottom twenty-five defensive teams statistic in a number of key areas. To do this, this researcher analyzed: points per game allowed by the defenses, turnovers created by the defenses, sacks per game, rushing yards allowed per game, passing yards allowed per game, third down conversion efficiency, and fourth down conversion efficiency. This researcher then analyzed which results have the biggest impact on the success of a football team winning the game. This analysis will help to determine which defensive strategies a team needs to be successful with and what needs to be executed to win a greater number of football games.

Guiding Questions

Some questions arose based on the data found from the numerous public sources studied. The first question was whether there really is a correlation between defensive statistical categories and winning or losing football games? Some will argue that different defensive categories have a bigger impact than others on winning, or have no impact at all, thus which defensive statistics are highly related to winning football games? The next question that arose was how big of a factor does sacks per game have on being a successful defense and winning football games? Sacks are huge plays for a defense as they result in negative yardage plays for the offense. Sacks make converting a first down much harder for the offense.

The next question was how big of an impact do defensive turnovers per game have on winning a football game? Defensive turnovers are important because they get the defense off of the field and give their team's offense the ball back, not to mention the momentum swing that it gives the team. Another question raised was how big of an impact does third down efficiency have on winning a football game and being a successful defense? Third down efficiency plays a large role throughout the course of a football game. If a defense stops the offense on third down there is a very good chance that the other team will be forced to punt the ball away which will get a defense off of the field and give the ball back to their offense.

The final question deals specifically with looking at a team's offense. Does a team with a great offensive time of possession win more games with a bad defense than a team with a good defense and an offense that has a low time of possession?

Hypotheses

The following sets of hypotheses based on the guiding questions were studied in this investigation;

Null One: The top twenty-five Division III teams with the most defensive sacks per game will win less or an equal number of football games than the bottom twenty-five Division III teams.

Research One: The top twenty-five Division III teams with the most defensive sacks per game will win more football games than the bottom twenty-five Division III teams with the least amount of defensive sacks per game.

Null Two: The top twenty-five Division III teams with the most defensive turnovers per game will win less or an equal number of football games than the bottom twenty-five Division III teams.

Research Two: The top twenty-five Division III teams with the most defensive turnovers per game will win more football games than the bottom twenty-five Division III teams with the least amount of defensive turnover per game.

Null Three: The top twenty-five Division III teams with the highest third down efficiency rating will win less or an equal number of football games than the bottom twenty-five Division III teams with the lowest third down efficiency rating.

Research Three: The top twenty-five Division III teams with the highest third down efficiency rating will win more football games than the bottom twenty-five Division III teams with the lowest third down efficiency rating.

Null Four: The top twenty-five Division III teams with the least defensive points allowed per game will win less or an equal number of football games than the bottom twenty-five Division III teams with the highest defensive points allowed per game.

Research Four: The top twenty-five Division III teams with the least defensive points allowed per game will win more football games than the bottom twenty-five Division III teams with highest defensive point allowed per game.

Null Five: The top twenty-five Division III teams with the highest fourth down efficiency rating will win less or an equal number of football games than the bottom twenty-five Division III teams with the lowest fourth down efficiency rating.

Research Five: The top twenty-five Division III teams with the highest fourth down efficiency rating will win more football games than the bottom twenty-five Division III teams with the lowest fourth down efficiency rating.

Null Six: The top twenty-five Division III teams with the least rushing yards allowed per game will win less or an equal number of football games than the bottom twenty-five Division III teams with most amount of rushing yards allowed per game.

Research Six: The top twenty-five Division III teams with the least rushing yards allowed per game will win more football games than the bottom twenty-five Division III teams with the most amount of rushing yards allowed per game.

Null Seven: The top twenty-five Division III teams with the least passing yards allowed per game will win less or an equal number of football games than the bottom twenty-five Division III teams with the most amount of passing yards allowed per game.

Research Seven: The top twenty-five Division III teams with the least passing yards allowed per game will win more football games than the bottom twenty-five Division III teams with the most amount of passing yards allowed per game.

Definition of Terms

The following key terms are used throughout this study:

Defensive Points Per Game: The average points a defense allows per game throughout the course of a season. Points are accumulated by scoring a touchdown or kicking a field goal.

Defensive Turnovers: When the defense takes the ball away from the offense from either an interception or a fumble recovery.

Sacks per game: The average amount of sacks per game throughout the course of a season. A sack is when the defense tackles the quarterback behind the line of scrimmage on a passing play.

Rushing Yards Allowed Per Game: The average yards allowed per game throughout the course of a season. A rush is when the quarterback hands the ball off to a running back or when the quarterback keeps the ball himself and attempts to run. Rushing yards are yards gained or lost from the line of scrimmage on rushing attempts from the offense.

Passing Yards Allowed Per Game: The average yards allowed per game throughout the course of a season. A pass is when the quarterback throws the ball to a receiver or running back. Passing yards are gained or lost from the line of scrimmage on plays where the quarterback throws the football.

Third Down Conversion Efficiency: Third down efficiency is a statistic that speaks to how effective a defense is at stopping the offense from reaching the line of gain on third down.

Fourth Down Conversion Efficiency: Fourth down efficiency is a statistic that speaks to how effective a defense is at stopping the offense from reaching the line of gain on fourth down.

Time of Possession: The amount of time throughout a game that the offense is in possession of the football.

Money Down: The defense refers to third and fourth downs as money down because if they stop the offense from converting they get off of the field.

Blitz Package: A blitz package is a new set of plays that a defense will install that will get the linebackers or secondary rushing the quarterback or running back.

Red Zone: The red zone refers to the defenses side of the field from the twenty yard line going into the end zone.

Chapter Summary

In football there has always been a saying: Offense wins games but defense wins championships. A great defense keeps the other team from scoring and also gets the football back for their offense. This action gives the team a better chance to win. This research study will help to clarify what defensive statistics are important for giving a team a better chance of winning football games. Specifically, this study addressed the following areas: Defensive points allowed per game, defensive turnovers, sacks per game, rushing yards allowed per game, passing yards allowed per game, third down efficiency rating, and fourth down efficiency rating to determine which of these defensive categories of play have an impact on winning football games.

Chapter 2

Review of Related Literature

Background

Every college football coach seeks a way to help give their team an advantage on the field that will assist them in winning football games. Finding an advantage using the opponent's previous games data, will help a coach win football games. It will also help improve certain specific areas of their defense. For example, a defensive coach can put in a new "blitz package" that will help support against the run, which will help improve the defense's rushing yards allowed per game.

There are numerous studies and reports describing how to better a defense and how to win football games. However, most of the studies and reports analyzed, used qualitative rather than quantitative data analysis. By using quantitative data analysis to formulate a strategy, this investigator believes that performing well in certain defensive statistics will result in more wins for a team on the field.

Defensive Points Allowed Per Game

In football defensive success is often measured by how many points per game the defense allows. Some defenses have a bend but don't break mentality, where they allow the offense to drive down the field but, ultimately, keep them out of the end zone. The first thing that offensive coaches seek to establish when preparing to face an opponent is a physical mismatch against a particular player or within the total defensive scheme of the opponent (Kirchenheiter, 1974). A defensive coordinator must recognize these weaknesses and try to hide them as much as possible or the defense is likely to get

"picked apart" by the opposing offense. All-time great National Football League

coaching legend Vince Lombardi said about football, "while it's the offense that gets the

glory and the glamour, it is the defense that brings the championships to the team"

(Lombardi, 1973 pg. 2). Coach Lombardi is a great person to listen to about winning

football games and defense as he helped lead the Green Bay Packers to five National

Football League Championships.

When looking at current successful defenses which a coach would want to shape

their defense around, the first defense that the coach would look at is the defense of the

Seattle Seahawks. The Seattle Seahawks won the Super Bowl in 2013 (the Super Bowl is

the game that decides who the best team is in the National Football League) and lost in

the Super Bowl in 2014 to the New England Patriots. When looking at the Seattle

defenses, one thing sticks out, defensive points allowed per game. In 2013 when the

Seahawks won the Super Bowl they were only allowing 14.4 points per game. That is

playing defense at a very high level as the Seahawks were dominating the competition by

allowing nine less points per game than the National Football League's average. The rest

of the league was allowing an average of 23.4 points per game (Evers, 2015). Defensive

points per game are a key contributor in determining how successful a team is going to be

and the Seahawks were the most recent example of that as they won the Super Bowl in

the 2013 season and were the runner up in the 2014 season.

To put into perspective how dominating the Seahawks defense was during the

2013 season one should look at the Washington Redskins, who were the worst team in

the National Football Conference (NFC) in 2013. While the Seahawks defense only

allowed 14.4 points per game, the Redskins allowed 29.8 points per game (Sports

Reference, 2013). During the regular season the Seahawks finished with a record of thirteen wins and three losses while the Redskins finished with a record of three wins and thirteen losses. This demonstrates the relationship between defensive points per game and the success of a football team. The equation is simple, don't let the opponent score often and the outcome of winning the game is very likely, let the opponent score often and the outcome of winning the game becomes very unlikely.

Importance of Sacks and Defensive Turnovers

Generating sacks and defensive turnovers are key elements for having a good defense. Sacks are huge plays for a defense as they make the line of gain for a first down farther and they also give the defense momentum that will help fuel their intensity. Coach Lombardi summed up the typical defensive player when he said "defensive football is a game of abandon, and you have to have the kind of players who will be able to play with abandon, the hell-for-leathers types" (Lombardi, 1973, pg. 5). Getting players to play with abandon is something that is generated by momentum and intensity. With greater intensity and momentum, players want to step up and make a play for their team. This leads the players to playing much faster which helps to create turnovers by the opponent.

To have a great or elite defense there must be a player on the defense that is a great pass rusher. Great pass rushers allow defenses to sack the quarterback without having to send extra players on a blitz. This allows the defense to keep everyone in defensive pass coverage which does not compromise its coverage and improves the chance of success (Dienhart, 2001). The further an offense has to go to reach the line of gain, the less likely they will convert and get a first down. It also gives the defense

another opportunity to sack the quarterback as the offense will again have to try and pass

the ball. Another reason why sacks are huge plays for the defense is because they

increase the opportunity to force a fumble and create a turnover.

The leader in sacks in the NCAA Division III in the 2014 season was Wabash

College. Wabash averaged 4.58 sacks per game (NCAA, 2015). 4.58 sacks per game is

playing dominate defensive football and it helped Wabash to a ten win season and they

advanced to the second round of the NCAA Division III playoffs where they lost to the

eventual National Champion, Wisconsin Whitewater. On the other end of the spectrum

was Sewanee College, the University of the South. Sewanee only averaged .30 sacks per

game (NCAA, 2015). Sewanee finished the 2014 season with only two wins and eight

losses. The difference from first to worst was 4.28 sacks per game and ten wins

compared to two wins. This demonstrates that sacks per game have a huge impact on the

success of a defense and increases the likelihood of winning football games. The

equation is simple, sack the quarterback and put the offense into long yardage situations

and winning football games is more likely while not sacking the quarterback and letting

the opposing offense gain positive yardage results in losing football games becoming

more likely.

Creating defensive turnovers is one of the best ways to win football games. Most

coaches would argue that the most important statistical factor in college football is

turnover differential (Hayes, 2005). Reviewing the National Champions from the 2000

season, the Oklahoma Sooners. The Sooners had a turnover differential of a positive

fifty-six. That is playing dominant defense as the Sooners won their seventh National

Championship (Murphy, 2001). Creating turnovers as a defense is import to a football

team's success because it not only gives the ball back to your team's offense, but it also creates momentum which will help to give a spark to the team.

Looking at the leader for the 2014 season in defensive turnovers in the NCAA Division III, Wesley College, created 52 defensive turnovers (NCAA, 2015). That is playing dominate defensive football and it helped Wesley to a twelve win season and they advanced to the semifinals of the NCAA Division III playoffs where they were one win away from playing for the Division III National Championship. Looking at the team that created the least number of turnovers, Fairleigh Dickinson University, only forced eight turnovers (NCAA, 2015). Fairleigh Dickinson finished the 2014 season with zero wins and ten losses. The difference between the best defensive team at creating turnovers and the worst team at creating turnovers was forty-four and twelve wins compared to zero wins. This demonstrates how important it is to create defensive turnovers. The equation is simple, force defensive turnovers and give the ball back to your team's offense and the chance of being successful and winning football games is heightened while not forcing defensive turnovers and letting the opposing offense possess the football and the chance of being successful and winning football games is decreased substantially.

Rushing and Passing Yards Allowed

Rushing yards and passing yards are how the offense moves the ball down the field against the defense. The defense wants to give up the least number of possible rushing and passing yards per game. Jack Giambrone who is currently a college professor at Sinclair Community College and a former professional football coach and the Assistant Commissioner of the Ohio Community College Athletic Conference, was once asked how to win football games from a defensive standpoint. Coach Giambrone's

number one answer was to stop the run (Giambrone, 2005). When an offense is able to

run the ball, at will, against an opponent, the defense is often broken and liable to give up

big plays from play action because the safeties are needed in run support and tend to get

downhill faster. The safeties play a critical role in both the running and passing game as

they are the last line of defense. In the run game, the safeties come down towards the line

of scrimmage to tackle the running back or ball carrier. In the passing game, the safeties

play over top of the defense to prevent a long pass from the offense. If the safeties have

to be used to stop the run, they will focus more on the running game instead of the

passing game which leads to giving up big plays. Coach Giambrone's philosophy was

simple, good defenses control the run while great defenses stop the run. If a defense can

stop the run it makes the offense one dimensional and much easier to stop. It also allows

the defensive ends to "pin their ears back" and rush the quarterback which can result in

sacks and bad throws from added defensive pressure.

When looking at the leader in rushing yards allowed per game in the NCAA

Division III, Wabash College, for the 2014 season allowed only 66.3 yards per game

(NCAA, 2015). That is playing dominate defensive football and it helped Wabash to a

ten win season and they advanced to the second round of the NCAA Division III playoffs

where they lost to the eventual National Champion, Wisconsin Whitewater. However,

when looking at the team who finished last against the run, Earlham College, who gave

up 282.3 rushing yards per game, they did not fare as well during the 2014 season.

Earlham College won zero games as they lost all ten games that they played in

throughout the course of the season. Stopping the run is very important because if a

defense cannot stop the run, an offense is able to impose its will throughout the game

which makes for a very long game for the defense. If a defense is good against the run, they will have a better chance at being successful and winning football games while a defense that is not good against the run will struggle to win football games.

Passing the football is one of the best ways to "rack up" a huge number of yards and eventual points against a defense. Spike Dykes the former Texas Tech Red Raiders head football coach was once asked what he expected from his defensive secondary unit. His answer was direct and to the point; to defend against the pass and prevent the deep ball for a score (Bobo & Dykes, 1998). One of the most deflating things for a defense is giving up a long pass for a touchdown. This normally happens from a missed assignment or mismatch in the secondary. Letting the offense gain yards is not as bad as it sounds, especially for a bend but don't break defense. The problem is when a defense allows a big play down the field, more times than not the result of that play is a touchdown.

When looking at the leader in passing yards allowed per game in the NCAA Division III, St. Lawrence University, for the 2014 season allowed an unbelievable 114.5 yards per game (NCAA, 2015). St. Lawrence did not qualify for the playoffs but still had a great season as they won eight games while only losing twice during the 2014 season. The University of La Verne did not defend the pass as well as St. Lawrence as they allowed 325 passing yards per game while only managing to win two games during the 2014 season (NCAA, 2015). This demonstrates that one of the keys to being a successful defense starts with defending against the pass. Teams that defend the pass well are more likely to be successful and win football games compared to teams that do not defend the pass well as those teams are much more likely to be on the losing end of the football game.

Third and Fourth Down Efficiency

Third and fourth down efficiency are areas that successful defenses must be good

at. Third and fourth down or what many coaches call "money down" is what makes or

breaks a team's possession of the football. Most teams, depending on field position will

punt the ball away to the other team on fourth down if they do not convert on third down.

This is important because it gets the defense off of the field and gives the ball back to the

offense. Fourth down is an all or nothing play for both the offense and defense because if

the offense gets a first down by reaching the line of gain, the offense will get a fresh set

of downs. If the defense is able to stop the offense then their offense will take over

possession from the spot of play. This is important because it once again gets the defense

off of the field and gives the ball back to the offense.

According to Wayne Winston and his research in *Mathletics*, football coaches are

way too conservative on third and fourth down. Winston believes that even if a team is

on its own ten yard line and the offense has less than two yards to go, they should "go for

it every time" (Winston, 2011). This is definitely unconventional wisdom because if the

offense would fail to convert from their own ten yard line and the other team would take

over possession with only ten yards to go to score a touchdown. Even though the

numbers, according to the Winston's study, would be on the offenses side, it would be a

devastating blow to turn the ball over inside a team's own red zone.

When looking at the best defense team in third down efficiency in the NCAA

Division III, Adrian College, for the 2014 season stopped the opposing offense 78.9

percent of the time (NCAA, 2015). That is a tremendous accomplishment as the Adrian

defense was successful 116 times out of 147 attempts. Adrian's third down efficiency

helped lead them to eight wins and to qualify for the Division III playoffs. Allegheny

College was not as good defensively on third down as the Allegheny Gators were only

efficient 47 percent of the time. Allegheny's defense was only successful 64 times out of

135 which led to Allegheny only winning one football game in the 2014 season. Again,

to be a successful defense you have to get off of the field. That can occur by creating

turnovers or coming up big on third down so the opposing team will punt the ball back to

the offense.

When looking at the best and worst defensive teams in the NCAA Division III for

fourth down efficiency there is again no surprise in the relationship between winning and

losing football games. Rhodes College was successful on twenty out of twenty-four

opportunities for an efficiency rating of 83 percent (NCAA, 2015). Rhodes College had a

successful season as they were able to win eight of their ten games. Kenyon College was

not as fortunate on fourth down as Rhodes was. Kenyon was only able to stop the

opposing offense once out of thirteen tries on fourth down for an efficiency of .07 percent

(NCAA, 2015). Kenyon's season, just as their fourth down efficiency, did not go as

planned as they were only able to win one game during the 2014 season. Good defenses

and great defense alike have to get off of the field on "money downs". Allowing offenses

to convert in these situations not only allows them to maintain possession of the ball but

conversions wears down the defense. As a result defenses make mental and physical

mistakes that would not have been made earlier in the game because of fatigue and

tiredness. Stop an offense on "money down" situations and the ball goes back to the

offense and the chance of being successful and winning football games is very high.

Continue to allow the opponents offense to maintain possession of the ball by not

stopping them on "money down" situations, the chance of being successful and winning football games is very low.

Motivation and Goal Setting

One of the best college football coaches of all time, Woody Hayes, believes that the people you have playing for you are much more important than the schemes you are calling (Hayes, 1973). This is very true as coaches can call the perfect play and still not get the desired result. Players that are motivated and have the will to win can and will make plays that they normally do not make when the game is on the line. That is why college football coaches have the year broken down into two situations. The first situation is the actual season where they are coaching the players that they have on the current roster. The second situation is the recruiting season. This is where coaches recruit high school seniors into their program so they can replace graduating seniors, players who will no longer be returning to school, and players that are just not good enough to get the desired result. If the players on the team are just not as good as the players on the other team, it is going to be a long football game.

The goal of every defensive coach and defensive football unit is to have the best defensive unit. To do this, defensive coaches set goals for their players to obtain which will help them become a great defensive unit. Every coach sets these goals or standards but very few actually succeed in accomplishing these goals. These goals give the players a will to succeed together in a team oriented fashion. Each player understands that it takes all eleven players on the field at one time to be successful. Furthermore, this creates an environment that is equal and together for the defense (Sari, Soyer & Yigiter, 2012). This will result in a better team effort that will get the entire defense, all eleven

players, to play as one collective unit. That is the goal that each defensive coach sets out

to accomplish at the beginning of every season when they set goals and try to motivate

their players.

Chapter Summary

There are many variables that determine the outcome of a collegiate football

game. These variables relate to the players, coaches, and defensive statistics that are

produced on the football field. Each defensive coach has their own philosophy and

scheme, which they believe will win football games. This chapter reviewed literature

which indicated that winning football games is determined by performing well in certain

defensive statistical categories. These categories were: defensive points allowed per

game, the importance of sacks and turnovers created by the defense per game, rushing

and passing yards allowed per game by the defense, and third and fourth down efficiency

by the defense. These defensive statistics are what wins football games while assisting a

coach to set proper defensive goals and get the defensive unit motivated for games.

Chapter 3

Methodology

Purpose

The purpose of this study was to investigate the relationship between defensive statistics and the success of an individual team on the football field. Essentially, this study set out to determine the relationship between certain defensive statistics and the direct impact each statistic had on winning and losing football games. This study used data from the two hundred and forty two football teams that participated in the NCAA Division III during the 2014 season. The football teams from around the country are divided into four regions and twenty-nine different conferences. All information and data that was collected for this study is available to the public - no human subjects were used throughout the course of this thesis.

Data Sources

All data collected for this investigation came from the National Collegiate Athletic Association Division III Football website. The participants consisted of the two hundred and forty two football teams that are associated with the National Collegiate Athletic Association's Division III football program from the 2014 season. More specifically, this research study analyzed the best twenty-five and worst twenty-five teams from specific defensive statistical categories. These defensive statistical categories consisted of: Defensive points allowed per game, sacks by the defense per game, turnovers forced by the defense per game, rushing yards allowed by the defense per game, passing yards allowed by the defense per game, defensive third down efficiency, and defensive fourth down efficiency.

Procedures

The first step in this research process was to determine what defensive statistical categories would be interesting and important to analyze. The second step was to look at the actual teams that were the best and worst in each defensive statistical category to make sure that the same twenty-five best teams and the same twenty-five worst teams were not the same in every category. If that were the case the study would be flawed and no defensive statistical category would change in matter of importance than the next. This researcher used the best and worst twenty-five teams from each defensive statistical category. In college football, at every division, the top twenty-five teams are voted on and ranked by number of votes from the coaches and the media. To be ranked in the top twenty-five is an outstanding accomplish so this researcher followed suit with that trend.

The next step was to gather the actual data. The ranking of the best and worst teams were already provided by the NCAA Division III website, however, the records of the teams were not provided (NCAA.com). After gathering the data, the next step was to analyze the data. This study was expected to answer the question:

- "What defensive statistics are the most effective in terms of a football team being successful and winning football games?"

Data Analysis

A two – sample t-test assuming equal variances was used to analyze and evaluate the data that was gathered in this study. The wins and losses were not weighted in this study as each team begins the season with zero wins and zero loses. The highest number

of wins that a team could have throughout the course of a season in the NCAA Division III was and continues to be fifteen. Multiple teams can finish with zero wins but only one team can finish with fifteen wins if any at all. During the 2014 season one team, Wisconsin Whitewater, the Division III National Champion did finish with fifteen wins since they went undefeated. Doing well in a certain defensive category does not guarantee that a team would go undefeated and win all fifteen games. However, what the analysis does support is what defensive statistical categories are more important for winning football games.

Chapter Summary

All data that was gathered for this study came from a public website and consisted of no human subject identifiers. An abundance of data was gathered and then split into the best and worst twenty-five teams for each defensive statistical category. From the data that was collected, t-tests were used to find a relationship between what defensive statistical categories were more important to football teams and their success in winning football games.

Chapter 4

Results

Purpose of the Study

The main goal of this study was to investigate the relationship between certain defensive statistics from the NCAA Division III 2014 season, to determine which defensive statistics are more important for winning football games. This information is helpful to current college coaches since it can help them prepare for upcoming seasons and better their chances for winning future football games. This research aids coaches as it provides a specific number of wins for the twenty-five best defensive teams and the twenty-five worst defensive teams in the specific defensive categories in NCAA Division III analyzed. Coaches will be able to use these results to better prepare their teams for winning future games.

Data Analysis Results

Below are the data analysis results for the seven sets of hypotheses studied. A ρ value of .05 significance was used when analyzing each hypothesis tested.

Null Hypothesis One: Table 1 below provides the data analysis results for null hypothesis one.

Table 1 Analysis of Defensive Sacks Per Game

Hypothesis	t Value	Critical Value	ρ Value	Decision
$H_{01} \leq \overline{X}_w$ $H_{11} > \overline{X}_w$	$t = 7.35$	$t = 2.01$	1.92×10^{-9}	Reject H_{01} Accept H_{11}

The top twenty-five Division III teams with the most defensive sacks per game will win less or an equal number of football games than the bottom twenty-five Division III teams with the least defensive sacks per game. The researcher found a t value of 7.35, when a t critical value of 2.01 was needed. The ρ value was 1.92×10^{-9}. When analyzing the results for null hypothesis one, the researcher found that null hypothesis one should be rejected and research hypothesis one should be accepted. This means that the Division III teams with the most defensive sacks per game will win significantly more football games.

Null Hypothesis Two: Table 2 below provides the data analysis results for null hypothesis two.

Table 2 Analysis of Defensive Turnovers Per Game

Hypothesis	t Value	Critical Value	ρ Value	Decision
$H_{02} \leq \overline{X}_w$ $H_{12} > \overline{X}_w$	$t = 7.73$	$t = 2.01$	5.71×10^{-10}	Reject H_{02} Accept H_{12}

The top twenty-five Division III teams with the most defensive turnovers per game will win less or an equal number of football games than the bottom twenty-five Division III teams with the least amount of defensive turnover per game. The researcher found a t value of 7.73, while a t critical value of 2.01 was needed. The ρ value was 5.71×10^{-10}. When analyzing the results for null hypothesis two, the researcher found that null hypothesis two should be rejected and research hypothesis two should be accepted. This means that the Division III teams with the most defensive turnovers per game will win significantly more football games.

Null Hypothesis Three: Table 3 below provides the data analysis results for null hypothesis three.

Table 3 Analysis of Defensive Third Down Efficiency

Hypothesis	t Value	Critical Value	ρ Value	Decision
$H_{03} \leq \overline{X}_w$ $H_{13} > \overline{X}_w$	$t = 7.46$	$t = 2.01$	1.45×10^{-9}	Reject H_{03} Accept H_{13}

The top twenty-five Division III teams with the highest defensive third down efficiency rating will win less or an equal number of football games than the bottom twenty-five Division III teams with the lowest third down efficiency rating. The researcher found a t value of 7.46, when a t critical value of 2.01 was needed. The ρ value was 1.45×10^{-9}. When analyzing the results for null hypothesis three, the researcher found that null hypothesis three should be rejected and research hypothesis three should be accepted. This means that the Division III teams with the highest third down efficiency rating will win significantly more football games.

Null Hypothesis Four: Table 4 below provides the data analysis results for null hypothesis four.

Table 4 Analysis of Defensive Points Allowed Per Game

Hypothesis	t Value	Critical Value	ρ Value	Decision
$H_{04} \leq \overline{X}_w$ $H_{14} > \overline{X}_w$	$t = 11.78$	$t = 2.01$	8.99×10^{-16}	Reject H_{04} Accept H_{14}

The top twenty-five Division III teams with the lowest defensive points allowed per game will win less or an equal number of football games than the bottom twenty-five Division III teams with the highest defensive points allowed per game. The researcher found a t value of 11.78, when a t critical value of 2.01 was needed. The ρ value was 8.99×10^{-16}. When analyzing the results for null hypothesis four, the researcher found that null hypothesis four should be rejected and research hypothesis four should be accepted. This means that the Division III teams with the lowest defensive points allowed per game will win significantly more football games.

Null Hypothesis Five: Table five below provides the data analysis results for null hypothesis five.

Table 5 Analysis of Defensive Fourth Down Efficiency

Hypothesis	t Value	Critical Value	ρ Value	Decision
$H_{05} \leq \overline{X}_w$ $H_{15} > \overline{X}_w$	t = 1.58	t = 2.01	.12	Accept H_{05}

The top twenty-five Division III teams with the highest defensive fourth down efficiency rating will win less or an equal amount of football games than the bottom twenty-five Division III teams with the lowest defensive fourth down efficiency rating. The researcher found a t value of 1.58, when a t critical value of 2.01 was needed. The ρ value was .12. When analyzing the results for null hypothesis five, the researcher found that null hypothesis five should be accepted.

Null Hypothesis Six: Table 6 below provides the data analysis results for null

hypothesis six.

Table 6 Analysis of Rushing Yards Allowed Per Game

Hypothesis	t Value	Critical Value	ρ Value	Decision
$H_{06} \leq \overline{X}_w$ $H_{16} > \overline{X}_w$	t = 9.35	t = 2.01	2.11×10^{-16}	Reject H_{06} Accept H_{16}

The top twenty-five Division III teams with the least rushing yards allowed per

game will win less or an equal number of football games than the bottom twenty-five

Division III teams with the most rushing yards allowed per game. The researcher found a

t value of 9.35, when a t critical value of 2.01 was needed. The ρ value was 2.11 x

10^{-16}. When analyzing the results for null hypothesis six, the researcher found that null

hypothesis six should be rejected and research hypothesis six should be accepted. This

means that the Division III teams with the least rushing yards allowed per game will win

significantly more football games.

Null Hypothesis Seven: Table 7 below provides the data analysis results for null

hypothesis seven.

Table 7 Analysis of Passing Yards Allowed Per Game

Hypothesis	t Value	Critical Value	ρ Value	Decision
$H_{07} \leq \overline{X}_w$ $H_{17} > \overline{X}_w$	t = 1.69	t = 1.6772	.0478	Reject H_{07} Accept H_{17}

The top twenty-five Division III teams with the least passing yards allowed per game will win less or an equal number of football games than the bottom twenty-five Division III teams with the most passing yards allowed per game. The researcher found a t value of 1.69, when a t critical value of 1.6772 was needed. The ρ value was .0478. When analyzing the results for null hypothesis seven, the researcher found that null hypothesis seven should be rejected and research hypothesis seven should be accepted. This means that the Division III teams with the least amount of passing yards allowed per game will win significantly more football games.

Chapter Summary

After all of the data was analyzed the researcher found that null hypotheses one, two, three, four, six, and seven were rejected and the corresponding research hypotheses should be accepted. The researcher found that null hypotheses five should be accepted. Thus, the researcher found that all defensive statistics analyzed in this study are important with the exception of null five; defensive fourth down efficiency. To win football games a defense must perform well in points allowed per game, sacks per game, turnovers per game, rushing yards allowed per game, defensive third down efficiency, and passing yards allowed per game.

Chapter 5

Discussion, Implications, Conclusions

Purpose of the Study

The purpose of this study was to investigate the relationship, if any, between the importance of specific defensive statistics between the top twenty-five Division III football teams and the bottom twenty-five Division III football teams. The defensive statistics that were used were defensive sacks per game, defensive turnover per game, defensive third down efficiency rating, defensive points allowed per game, defensive fourth down efficiency rating, rushing yards allowed per game, and passing yards allowed per game.

Discussion of Results

The data analysis for null hypothesis one found a significant difference in the top twenty-five Division III teams with the most defensive sacks per game and the bottom twenty-five Division III teams with the least defensive sacks per game. When comparing the average win total of the top twenty-five Division III teams to the bottom twenty-five Division III teams in defensive sacks per game, the top twenty-five teams won an average of 5.2 more football games during the 2014 season. This led to null hypothesis one being rejected and research hypothesis one being accepted. This means that to win football games a defense has to be good at creating sacks. To create sacks it takes all eleven players on the field at a time doing their job by precisely playing their positions. Most of the time sacks are made by defensive linemen or linebackers. However, if the defensive backs do not do a good job of covering the receivers, the opposing quarterback will be

able to throw the ball rather than having to hold onto the ball while waiting for a receiver to get open.

The data analysis for null hypothesis two found a significant difference between the top twenty-five Division III football teams with the most defensive turnovers per game and the bottom twenty-five Division III teams with the least defensive turnovers per game. When comparing the average win total of the top twenty-five Division III football teams to the bottom twenty-five Division III teams in defensive turnover per game, the top twenty-five teams won an average of 5.72 more football games during the 2014 season. This led to null hypothesis two being rejected and research hypothesis two being accepted. This means that to win football games a defense must be good at creating turnovers. Creating turnovers provides a huge momentum shift for a team. These turnovers can be created by intercepting a pass from the opposing quarterback, forcing the opposing running back to fumble the football, and/or sacking the opposing quarterback and stripping the ball out of his hands.

The data analysis for null hypothesis three found a significant difference between the top twenty-five Division III football teams with the highest third down efficiency rating and the bottom twenty-five Division III teams with the lowest third down efficiency rating. When comparing the average win total of the top twenty-five Division III football teams to the bottom twenty-five Division III teams in third down efficiency rating, the top twenty-five teams won an average of 5.24 more football games during the 2014 season. This led to null hypothesis three being rejected and research hypothesis three being accepted. This means that to win football games a defense must be good at stopping the offense on third down. Stopping offenses on third down is critical for a

team's success because if the other team does not have the football it is very difficult for them to score points. By stopping the opposing offense they will be forced to punt the football back to your own team's offense.

The data analysis for null hypothesis four found a significant difference between the top twenty-five Division III football teams with the least defensive points allowed per game and the bottom twenty-five Division III teams with the most defensive points allowed per game. When comparing the average win total of the top-twenty five Division III teams to the bottom twenty-five Division III teams in defensive points allowed per game, the top twenty-five teams won an average of 7.2 more football games during the 2014 season. This led to null hypothesis four being rejected and research hypothesis four being accepted. This means that to win football games a defense must be good at keeping the opposing team off of the scoreboard. Averaging 7.2 more wins over the course of a season is a "huge number" especially when most teams only play ten games throughout the course of a football season.

The data analysis for null hypothesis five did not find a significant difference between the top twenty-five Division III football teams with the highest fourth down efficiency and the bottom twenty-five Division III teams with the lowest fourth down efficiency. When comparing the average win total of the top twenty-five Division III teams to the bottom twenty-five Division III teams in defensive fourth down efficiency rating, the top twenty-five teams only won an average of 1.1 more football games during the 2014 season. This led to null hypothesis five being accepted. This means that to win football games a defense does not have to be good at stopping the offense on fourth down, according to the data from the 2014 season. However, this researcher wants to

point out that the data was trending toward significance at $p = .12$. This means that being good on fourth down efficiency is still important for a defensive unit.

The data analysis for null hypothesis six found a significant difference between the top twenty-five Division III football teams with the least rushing yards allowed per game and the bottom twenty-five Division III teams with the most rushing yards allowed per game. When comparing the average win total of the top twenty-five Division III football teams to the bottom twenty-five Division III teams in rushing yards allowed per game, the top twenty-five teams won an average of 6.48 more football games during the 2014 season. This lead to null hypothesis six being rejected and research hypothesis six being accepted. This means that to win football games a defense must be good at stopping the run. Stopping the run is critical to a team's success because if an offense is able to run the football, the defensive coach must take players out of coverage and use them to defend against the run. When this occurs some offenses are able to take shots down the field in the passing game which can result in big plays and touchdowns.

The data analysis for null hypothesis seven found a significant difference between the top twenty-five Division III football teams with least passing yards allowed per game and the bottom twenty-five Division III teams with the most passing yards allowed per game. This led to null hypothesis seven being rejected and research hypothesis seven being accepted. When comparing the average win total of the top twenty-five Division III football teams to the bottom twenty-five Division III teams in passing yards allowed per game, the top twenty-five teams won an average of 2.28 more football games during the 2014 season. This means that to win football games a defense has to be good at

stopping the opposing offense from passing the football, according to the data from the 2014 season.

Implications

The main pupose of this study was to find which defensive statistics were the most important for football teams to win games. This study found a large difference in certain specific defensive categories, while some defensive categories showed they were not as important for winning football games. The researcher found that the order of importance for defensive statistics from the 2014 Division III season are as follows: defensive points allowed per game, rushing yards allowed per game, defensive turnovers per game, defensive third down efficiency, defensive sacks per game and passing yards allowed per game. Defensive fourth down efficiency proved to not play as critical of a role in the outcome of football games. The researcher came to this conclusion based on the significant differences between defensive points allowed per game, rushing yards allowed per game, defensive turnovers per game, defensive third down efficiency, and defensive sacks per game while there was not a significant difference between passing yards allowed per game and defensive fourth down efficiency.

Suggestions for Future Research

Future research should be conducted from the offensive side of the football to determine which offensive statistics are important for winning football games. If a relationship is found similar to that for the offensive statistics, coaches around the country, at the Division III level will know what areas their teams need to perform well in and can allocate practice time in these areas. Also, another study that could be conducted

would be to analyze a team's offensive and defensive statistics together. For example, taking the overall net gain/loss and then analyze the data in a study. In this typed study rushing yards allowed per game played a significant role on the outcome of winning football games. If that would be the case in an offensive statistical breakdown, find the net rushing yards of that team and see where it ranks with other teams at the Division III level. Another interesting study would be to analyze this study from a NCAA Division I and NFL level.

Strengths and Limitations of the Study

The strength of this study was its ability to provide a defensive blueprint for Division III football coaches around the country. This study highlighted which defensive statistics were significant for winning football games and which defensive statistics were not as important to team's winning football games. Further study should lead to a more in depth research of the entire game or on the offensive side of the football. Also, conducting the same study at the NCAA Division II and NCAA Division I levels need to be done to determine if the results found at Division III are the same as or similar to results at Division I and Division II.

One possible limitation of this study could be the level of competition that the top twenty-five Division III teams played. If a team that ranked in the top twenty-five played in a conference that was not very good, they could have a bad defense but one that was good enough to beat mediocre opponents. Another possible limitation of this study could be the final quarter or drive of a football game. When a team is winning in the fourth

quarter their goal is run out the clock and win the game. When a team is losing in the fourth quarter their goal is to score to tie the game or make it a one possession game. With these two scenarios the game plan shifts and the offense tends to become one dimensional which can alter the data. Thus some defensive statistics at the end of games can become jaded. This means that when a team has a lead in the fourth quarter, they become more conservative and will only run the football to avoid the chance of throwing an interception. Also, if a football team is very bad offensively and never scores points it can alter the statistics. A team's defense could be very dominating but if they are always losing at the end of the game the other team will never throw the football which makes it very difficult to create sacks.

Summary

The results of this study found a significant difference in certain defensive statistical categories between Division III football teams with the most wins and those with the least wins. The researcher found that defensive points per game, rushing yards allowed per game, defensive turnovers per game, defensive third down efficiency, defensive sacks per game, and passing yards allowed per game all played pivotal roles in determining if a team was going to win the football game. The equation is simple, perform well in those six areas and the chances of a team winning football games are very high. Do not perform well in these six areas and the chances of a team winning football games are very low. Further research across the NCAA Division II and NCAA Division I levels need to be conducted in order to determine if the results from the NCAA Division III analysis remain consistent as competition level increases.

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