High School Athletics: Coaches' Opinions on Performance Enhancing Drugs

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Dedication

This dissertation is dedicated to our family members who are no longer with us.

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Abstract

The purpose of this study was to determine if differences existed between high school athletic coaches of certain demographic categories and their opinions regarding the classification, testing, and punishment associated with performance enhancing drug use by high school athletes. Understanding high school athletic coaches' current opinion on performance drugs is an integral piece to determining a need for continuity in performance enhancing testing and education in high school athletics. A quantitative research study was conducted to determine if differences existed between variables. During analysis, the independent variables for the sample of high school athletic coaches were gender, years in high school coaching, paid versus volunteer status, grade level(s) coached, and sport(s) coached. Dependent variables for the sample of high school athletic coaches included personal classification of performance enhancing drugs (PEDs), level of desire to implement testing of PEDs, and opinion on punishment levels associated with assumed PED testing. A purposeful sample of high school athletic coaches from Midwestern school districts was selected to complete a questionnaire regarding performance enhancing drug classification, testing, and punishment in high school athletics. Based on the results of the statistical analysis, changes in performance enhancing drug testing and education were recommended for the districts, other school districts, and high school athletics nationwide.

Keywords: performance enhancing drugs, high school, coaches

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CHAPTER I: INTRODUCTION

Background and Rationale

The average salary of many professional athletes is in the millions of dollars. Combined with multi-million dollar endorsement deals, appearance fees, and countless other ways to make money, being a professional athlete is a very lucrative career path. Unfortunately, while only a small portion of individuals are blessed with the God given ability to excel in athletics at the highest level, some are close enough to risk everything to make it big. Athletes spend years defining their skills and becoming professionals. From pee-wee leagues to high school teams all the way up to the professional arena, there is immense pressure to perform.

High school locker rooms are full of stories about accomplishments both past and present. They may also be full of instructions on how to get away with using Performance Enhancing Drugs (PEDs). Society's expectations on winning combined with an ever increasing need for college level scholarships places unwanted stress to perform at the highest level. While many athletes spend years searching for ways to legally gain an advantage over their competition, some athletes turn to PEDs to accelerate this process and become better than they ever thought possible

PEDs, are a wide range of over the counter and prescription substances used to increase strength, speed, or any other athletic skill an athlete wishes to improve. For the average athlete, no amount of drugs will turn anyone into a Hall of Fame player. However, when professional athletes are caught using PEDs that are banned by the governing rules of their sport, it gives the appearance that cheating is the only way to get ahead. The trickle-down effect means that some athletes will begin using PEDs in high school.

Drug use at any age is dangerous, but more so at a time when puberty and poor reasoning skills are at their peak. The simplistic assumption that using PEDs automatically grants access to a major league contract is similar to that of playing the lottery. While the lottery may only cost a few dollars, PEDs usage could have lasting health effects, not to mention a lifetime of disappointment that come with one's unfulfilled dreams of becoming a professional athlete.

In spite of the aforementioned risks and likelihood of failure, many would argue that the rewards of PED usage outweigh the risks. Our society places an extreme amount of pressure and status on professional athletes. Many superstars are even considered celebrities in their own right. This status may be alluring to a 17 year old athlete, especially when combined with the potential of earning more money than one can spend in a lifetime. Although, athletes can be punished for using PEDs through a variety of suspensions and even lifetime bans, rarely is money ever taken from them. Assuming that some athletes have a lack of moral conviction and respect for their sports, some would argue that using PEDs is an easy ticket to money.

When professional athletes are seen being slapped on the wrist for PEDs usage it sends a message to young adults that if you can just make it big, you can do no wrong. The sports media also focus much of their coverage to breaking records, some of which were later known to have been broken under the influence of PEDs. This mixed message may blur the lines of right and wrong in young athletes, especially when former athletes speak out about how widespread PED use is and how few actually get caught. This "everybody is doing it" mentality may further accelerate a high school athlete to use PEDs.

Our society establishes laws to deter people from using drugs, but the same is not true in all levels of athletics. Olympic, professional, and college athletic governing bodies have different degrees of punishment depending on the type of PED used and the number of offenses.

High school athletics depend on the individual state's laws regarding testing of student athletes. In all but five states, there is no testing for PED and therefore some athletes take on a "why not" approach to PED usage. The entire stadium may know one athlete is using PEDs but no formal punishment may be imposed. The honor code style of testing may not be accepted by society, coaches, parents, officials, or other athletes who do not use PEDs.

The passion for this topic stems from the researcher's lifelong experience in athletics. Over a combined span of almost fifty years, the researcher has been involved in all aspects of sport including playing, coaching, instructing, officiating, and grounds maintenance. During these experiences, the researcher has been privy to observing and hearing multiple accounts of PED usage in athletics. While accounts range from fact to superstition, the underlying tone was that some athletes will try anything to gain an advantage.

One specific item mentioned numerous times during the researcher's experience was smokeless tobacco or chew as it is commonly known. The buzz created by the nicotine in chew gives the athlete a temporary high in which they may feel alert or focused. In baseball, for example, chew is outlawed at every level of competition, but the rule is rarely, if ever, enforced. The assumption that it is just part of the game may be a reason for the lack of enforcement. Furthermore, again from the researcher's perspective, the only reason it appears to be outlawed is to improve the public image of professional baseball. If many young athletes are fans of the game they may try to imitate some of their favorite players, even if it means trying PEDs.

Other common accounts include using a depressant such as alcohol to relax athletes before competition. Most athletic competitions are filled with situations involving pressure to perform. Similar to test anxiety, some athletes are unable to cope with pressure on their own so they turn to alcohol to ease their stress. Alcohol is consumed before the competition in amounts

small enough to not be intoxicated but large enough to achieve a relaxed feeling. Many may argue that a substance that decreases performance is the exact opposite as a PED, but if an athlete feels they are gaining an advantage, and their performance shows improvement, it should be considered with other PEDs.

The most recent of the researcher's personal accounts dealt with a cocktail of drugs. While the mixture of PED ingredients was unknown to the researcher, the health risks were visible. Another athlete was seen excreting puss from his nipples. While lactation in males is not completely uncommon, the puss, also known as galactorrhea, was a clear sign of liver disease (NYU Med, 2013). What was even more disturbing was the apathy and even humorous nature the athlete brushed off the medical symptom.

The final example may not be all that common to PED usage, but even one case is far too many. The fact that any minor can purchase a range of supplements from nutrition stores is alarming. Even more alarming is the lack of knowledge and overall difference of opinion that employees in the supplement industry have. During a review of one anonymous nutrition chain, the researcher visited three different stores operated by the same company. The first store employee noted more than 5000 products were carried in the store (Anonymous Nutrition Chain, personal communication, 2014). Of the 5000, 4 products (containing geranium stem) are currently banned in professional athletics (Anonymous Nutrition Chain, personal communication, 2014). While the banned products can only be purchased by those over the age of 18, there is no age limit on any other product in the store (Anonymous Nutrition Chain, personal communication, 2014). The company rationale is that no pharmaceuticals are sold and products are naturally found in food, therefore they are safe for consumption for all age and ability levels (Anonymous Nutrition Chain, personal communication, 2014).

The second store also estimated 5000 total products were carried (Anonymous Nutrition Chain, personal communication, 2014). However, the employee noted that nearly ten products were banned (Anonymous Nutrition Chain, personal communication, 2014). Specifically, the products were banned because they contained oxygenators (Anonymous Nutrition Chain, personal communication, 2014). There was no mention of geranium stem as a banned product. Again, all ten products were not available to minors, but other products were included in the "not for minors" category (Anonymous Nutrition Chain, personal communication, 2014). The employee noted that "hardcore sports" and "cleansers" were unavailable to minors because they contain testosterone boosters (Anonymous Nutrition Chain, personal communication, 2014). Also, certain pre-workout supplements were only for adults but when asked for a reason, the employee was very vague and referred to their ingredients as the main factor (Anonymous Nutrition Chain, personal communication, 2014).

The final store yielded no information, but provided a very telling response. The employee simply declined to answer questions because it was against company policy to do so (Anonymous Nutrition Chain, personal communication, 2014). The wide array of answers combined with the lack of, or even unwillingness to have, knowledge seems to expose a level of uncertainty in the supplement industry. Many of the thousands of products available to minors come with warning labels regarding the lack of evaluation from the FDA. Accessibility, uncertainty, and the lack of detectability of these products are arguments for overhaul and agreement in high school PED testing.

Problem Statement

Information from multiple studies regarding drug testing effectiveness is contradictory and appears to depend on PED prevalence and types of drugs tested. Having a local agreement

on PED testing may lead to a national standard of testing for all high school athletes similar to requiring student athletes to have a physical and parental permission to participate. The equality of nationwide testing standards would create an even playing field for athletes trying to legitimately gain college scholarships for athletics. While it may not be multimillion dollar contracts and instant fame, legitimizing high school athletics may ultimately have a trickle up effect for our superstar professional athletes of today.

Unfortunately, drug testing minors in athletics is riddled with red tape and politics. One must first assume that there is in fact a widespread usage of PEDs. Second, coaches, officials, parents, administrators, and athletes would collectively need to show a desire and acceptance of PED testing. Third, those individuals would need to agree on what exactly is a PED. Finally, all parties would also need a standard punishment agreement if an athlete tests positive for PED usage. While the first assumption is a topic for another study, the researcher utilized a survey of coaches to find a starting common ground regarding the establishment of PED testing in states where no such rule exists. Specifically, the researcher sought to gain information on high school coaches understanding of PEDs that is not currently in the literature. This very important topic needs to be explored to inform future policy in high schools. Furthermore, the researcher's future plan to be involved in high school administration was part of the objective of conducting this particular study as he desires to use this information as an agent for change in publishing and presentation to high school athletic coaches.

Purpose of the Study

The purpose of this study was to determine if differences existed between high school athletic coaches of certain demographic categories and their opinions regarding the classification, testing, and punishment associated with performance enhancing drug use by high school athletes.

A quantitative research study was conducted to determine if differences existed between variables. During analysis, the independent variables for the sample of high school athletic coaches were gender, years in high school coaching, paid versus volunteer status, grade level(s) coached, and sport(s) coached. Dependent variables for the sample of high school athletic coaches included personal classification of performance enhancing drugs (PEDs), level of desire to implement testing of PEDs, and opinion on punishment levels associated with assumed PED testing. A survey was administered that allowed the researcher to gather descriptive data on these dependent variables. Based on the results of the statistical analysis of the survey, changes in performance enhancing drug testing and education may be recommended for the districts, other school districts, and possibly, high school athletics nationwide, based on a range of demographics related to high school athletic coaches. These demographics included, but were not limited to: gender, level of coaching, type of sport coached, etc.

Research Questions

Based on the purpose statement, the following research questions were used to guide the study:

Q1: What do high school athletic coaches of certain demographic categories consider a PED?

Q2: Do high school athletic coaches of certain demographic categories wish to implement drug testing on high school athletes?

Q3: Are there differences among high school athletic coaches' views, based on demographic categories, on punishments for a student athlete's positive performance enhancing drug test?

Definitions

The following operational definitions are of significance to the understanding of the research study:

Agent: another term for "drug," specifically masking agents are drugs which "help to hide the present of performance enhancing drugs," (ProCon, 2009).

Doping: "the illegal use of a drug (such as a steroid) to improve an athlete's performance," (Merriam-Webster, 2014).

High school athletic coach: individual who, in the last calendar year, has coached at least one high school sport (Greco, 2014).

Performance Enhancing Drug (PEDs): "Common abbreviation for performance enhancing drugs; refers to substances taken to improve athletic performance," (ProCon, 2009).

Prohibited List: Created by the World Anti-Doping Agency (WADA) to include "drugs that athletes may not use because they are performance enhancing, have a health risk, violate the spirit of sport, or may be a masking agent," (ProCon, 2009).

Student athlete: individual who, in the last calendar year, has participated in at least one high school sport (Greco, 2013).

Testing: sample collection process to determine prohibited substance use; can include urine or blood collection process (USADA, 2014).

United States Anti-Doping Agency (USADA): the national anti-doping organization (NADO) in the United States for Olympic, Paralympic, Pan American and Parapan American sport," (USADA, 2014).

World Anti-Doping Agency (WADA): international independent agency composed and funded equally by the sport movement and governments of the world. Its key activities include

scientific research, education, development of anti-doping capacities, and monitoring of the World Anti Doping Code (Code) – the document harmonizing anti-doping policies in all sports and all countries," (WADA, 2011).

World Anti-Doping Code: "also known as the 'WADA Code' or simply 'The Code,' is the main document upon which the WADA anti-doping program is based. Its purpose is to coordinate detection, deterrence, and prevention of doping at the international and national level of sports." (ProCon, 2009).

Assumptions

The research study's assumptions related to high school athletic coaches' demographic categories and their opinions regarding the classification, testing, and punishment associated with performance enhancing drug use by high school athletes. Assumptions were made regarding these coaches and their participation in the study. Related to the coach are assumptions that they have a basic understanding of PEDs, use English as their primary language, and have an introductory ability to use a computer. Assumptions related to the sample were that the respondents' selections are similar in representing differences in age, gender, and sports coached. In addition, the researcher assumed the participants answered all questions honestly.

Scope

The scope of the research study included high school athletic coaches in Midwestern school districts. The coaches were recruited from the regional coaching association which had provided an electronic email address list for all members of the association. The study focused on the possible differences between high school coaches' demographic categories and their

opinions regarding the classification, testing, and punishment associated with performance enhancing drug use by high school athletes.

Limitations

Limitations are conditions that restrict the scope of a study, cannot be controlled by the researcher, and may affect the outcome of the study. The following limitations are considered for this study:

1. Individuals among the coaches surveyed may not be truthful about their answers to the electronic survey.

2. Outside experiences may have an impact on how participants respond to the electronic survey questions.

3. High school athletic coaches' opinions may be in line with their districts' views on drug testing, which may influence their answers on the survey.

4. High school athletic coaches may have diverse backgrounds and values not targeted on the survey that may form their perceptions of performance enhancing drugs and best practices related to the classification, testing, and punishment associated with performance enhancing drug use by high school athletes.

Delimitations

The research study contains delimitations which are the restrictions and/or boundaries the researcher imposes prior to the study's inception to ensure that the scope of the study is manageable. The following delimitations were considered for this study:

1. The study only includes high school athletic coaches who have provided their email address to the regional coaches' association.

2. Only coaches who have coached at least one high school sport in the last calendar year were surveyed.
3. Only English-speaking high school athletic coaches were surveyed.
4. Only high school athletic coaches with access to a computer with internet capabilities were surveyed.

As a result of the delimitations, the findings of this study may or may not be generalizable to other subpopulations, locations, and/or time periods.

Generalizing of Findings

The study does not focus on the development of coaches' beliefs, but includes basic findings on the possible differences between demographic categories and opinions regarding classification, testing, and punishment associated with performance enhancing drug use by high school athletes that can lead to further research within all components. Purposeful sampling was used in this study, resulting in questions regarding the representativeness of the sample. The study was conducted in the Midwest, and may not generalize to larger populations as it may be biased towards high school coaches who have only been regionally trained. In addition, high school coaches who have not provided their email address to the regional coaching association in the last year were not included in the study. Furthermore, high school coaches who are not comfortable with technology might have been less likely to complete the survey and therefore may be underrepresented in the study. The use of a purposeful based sampling design, along with other recognized limitations and delimitations, precludes generalization to larger populations.

Summary

This chapter presents an overview of the concerns in high school athletics regarding the possible differences between high school athletic coaches' demographic categories and their opinions regarding the classification, testing, and punishment associated with performance enhancing drug use by high school athletes. The researcher also included the study's purpose and problem statement followed by research questions, a list of defined terms, limitations, and delimitations. The research questions listed were used as a guide for the literature review portion of the study. The goal of the research questions were to discover if differences existed between high school athletic coaches' demographic categories and their opinions regarding the classification, testing, and punishment associated with performance enhancing drug use by high school athletes. This information is pertinent in understanding a baseline of support for the possible implementation of high school athletic drug testing.

CHAPTER II: LITERATURE REVIEW

A review of literature explored historical examples of performance enhancing drug (PED) usage, types of PEDs, current laws and regulations associated with PED testing, examples of PED high school legislation, and an overview on the need for additional opinions from high school coaches. The review helped determine if PED usage in high school athletics illuminates a need for continuity in performance enhancing drug testing and education and whether testing methods, allowable drugs, and punishments differ in all level of athletics. The review also helped determine if parents, administrators, coaches, and even athletes have given input into past PED testing initiatives. The researcher wished to determine if utilizing the individuals involved in athletes' day-to-day activities may give better insight into if PED should be tested for in high school athletics, as well as for which drugs athletes should be tested. Additionally, a determination needs to be made as to what level of punishment to implement if a positive test is acquired to determine a comprehensive testing plan of PED usage in high school athletics.

Historical Context

Recent media attention regarding performance enhancing drug (PED) suspensions in professional athletics would lead the casual sports observer to believe cheating to gain an advantage is a relatively new concept. However, many records indicate that PED usage is as old as sports themselves. Doping, as PED usage is often referred to, is defined as "the use of a prohibited substance or method in an attempt to gain an advantage in athletic competition," (ProCon, 2013). A review of the historical timeline of doping in athletics found a wide range of examples dating as far back as 776 BC (ProCon.org, 2012). The summary below provides not only highlights from the literature review, but also evidence of the evolution of PEDs in athletic competition today, including current arguments for what should be considered a PED.

One of the earliest known records of athletes improving performance above their own natural ability comes from the Greek Olympic games. Bowers (1998) noted that opium juice was a favorite among the ancient Greek athletes. Although today's versions of opiates are usually prescribed in narcotic form, which would violate PED laws, the Greeks tested opiates as part of dietary changes that would be legal today. The practice of over indulging on meat products such as animal hearts and testicles was tested for its performance enhancing properties (Jenkins, 2007). Similarly, Roman gladiators used different forms of food and drink to increase energy during battles, enticed by the rewards of victory including homes and avoiding military service (Aziz, 2006).

Fast forward to the late 1920's and a near 2700 year gap existed between the first documented use of PEDs in athletics and the first rule banning their usage in competition. The rule, banning doping, was implemented in 1928 by the International Association of Athletics Federation (IAAF) (IAAF, 2009). While the newly created rule only applied to track and field, it was the basis of all PED rules and regulations to date. After World War II had ended, the world came to understand the magnitude of the atrocities committed by Nazis in prison camps, including the testing of testosterone on prisoners. Successful tests led to the distribution of testosterone to German soldiers to increase strength (Sports Illustrated, 2008). Allied forces were also known to distribute drugs to soldiers as amphetamines were widely used by American troops to help combat fatigue (Brecher, 1972). The practice of using stimulants quickly crossed over to sports once troops returned home from war.

Toward the end of the 1950's a super drug was created. This drug was called "anabolic steroids," and was created by a pharmacist known as Dr. John Bosley Zieglar (Peters, 2005). Steroids utilized the strength building aspects of testosterone while reducing the negative side

effects typically associated with prolonged usage (Peters, 2005). With FDA approval, Dr. Zieglar changed the face of athletics and unintentionally created a way for the average athlete to gain strength and muscle mass that would be impossible without pharmaceuticals. Even today, designer versions of anabolic steroids are being utilized by athletes to gain an advantage over their competition. Unfortunately, the negative health effects associated with the abuse of steroids caused Dr. Zieglar to regret his invention of the drug, he was outspoken against its usage until his death in 1983 (Peters, 2005).

The 1960's included a large amount of history regarding PED usage in athletics, both positive and negative. In this 10 year span, two athletes died and another was disqualified for doping during competition. Both deaths were caused by amphetamine usage, while the disqualification was due to excess alcohol (ProCon.org, 2012). As a result of the deaths, the International Olympic Committee (IOC) creates the Medical Commission in 1967 for the "protection of the health of athletes, respect for medical and sport ethics, and equality for all competing athletes," (IOC, 2013). The next year the IOC began testing athletes at both the Winter and Summer Olympic games. The results from these, and other, Olympic tests are listed in figure 1 and figure 2 and show that only the 1976 Montreal Summer Olympics had greater than 1% of positive doping cases reported, indicating a much lower rate of doping than previously assumed (ProCon.org, 2011).

Figure 1. Summer Olympic Doping Cases

I. Summer Olympics Doping Cases				
Year	**Place**	**Number of Drug Tests**	**Number of Doping Cases**	**Percentage of Doping Cases**
2008	Beijing, China	4,770	20	0.42%
2004	Athens, Greece	3,667	26	0.74%
2000	Sydney, Australia	2,359	11	0.47%
1996	Atlanta, USA	1,923	2	0.10%
1992	Barcelona, Spain	1,848	5	0.27%
1988	Seoul, S. Korea	1,598	10	0.63%
1984	Los Angeles, USA	1,507	12	0.80%
1980	Moscow, Russia	645	0	0.00%
1976	Montreal, Canada	786	11	1.40%
1972	Munich, Germany	2,079	7	0.34%
1968	Mexico City, Mexico	667	1	0.15%
-----	**Total**	**21,849**	**105**	**0.49%**

Figure 1. Total number of tests, cases, and percentage of cases reported from Summer Olympics from 1968 to 2008 by ProCon (2011).

Figure 2. Winter Olympic Doping Cases

II. Winter Olympics Doping Cases				
Year	**Place**	**Number of Drug Tests**	**Number of Doping Cases**	**Percentage of Doping Cases**
2010	Vancouver, Canada	2,149	3	0.14%
2006	Turin, Italy	1,219	7	0.57%
2002	Salt Lake City, USA	700	7	1.00%
1998	Nagano, Japan	621	0	0.00%
1994	Lillehammer, Norway	529	0	0.00%
1992	Albertville, France	522	0	0.00%
1988	Calgary, Canada	492	1	0.20%
1984	Sarajevo, Bosnia	424	1	0.24%
1980	Lake Placid, USA	440	0	0.00%
1976	Innsbruck, Austria	390	2	0.51%
1972	Sapporo, Japan	211	1	0.47%
1968	Grenoble, France	86	0	0.00%
-----	**Total**	**7,783**	**22**	**0.28%**

Figure 2. Total number of tests, cases, and percentage of cases reported from Winter Olympics from 1968 to 2010 by ProCon (2011).

Improvements in the testing and understanding of PEDs led to an increase in frequency and types of drug testing during the 1970's. The seven athletes removed from competition during the 1972 Summer Olympic games were a result of full scale testing, a first at the Olympic games (Verroken & Mottram, 2005). Ironically, it was not until the next Summer Olympic games that athletes began testing specifically for anabolic steroids. This was a direct result of not only the discovery of anabolic steroids, but the development of reliable testing in 1975 (Mottram & Verroken, 2005). Although the addition of testing for anabolic steroids led to the highest recorded percentage of doping cases reported at the Olympic games, the 1.4% does not represent the majority of the athletes competing (ProCon.org, 2011).

The low number of doping cases during Olympic games in the 1970's may have been due to the non-randomization of drug tests issued. Athletes arrived at the Olympics knowing that they would be tested. Surprise testing, like those issued at the 1983 Pan Am Games, yielded far different results. Dozens of athletes withdrew from the competition once they learned of the last minute testing, while nearly twenty others failed altogether (CBC Sports, 2003). The harsh climate against PEDs began to capture political attention in the late 1980's. The Anti-Drug Abuse Act and the Anabolic Steroids Act outlawed the use of steroids for non-medical purposes and reclassified steroids as a class three controlled substance (ProCon.org, 2012). Steroids, as a specific PED, were quickly becoming more of a storyline that the competitions.

Until the 1990's, steroids were mainly connected to international competitions such as the Olympic games. Professional sporting organizations in the United States not only did little testing for PEDs, many leagues did not have a single policy regarding their usage in competition. The evolving climate regarding steroids in the late 1980's resulted in legislation against their use. Considering these events, Major League Baseball (MLB) was forced to issue a statement

regarding its stance on PEDs in 1991. At that time, a memo sent to MLB organizations by Commissioner Fay Vincent included steroids but merely to say that they, and any other controlled substances, were not allowed (Farrey, 2005). What the memo failed to mention is any type of punishment associated with the use of these substances. Six years later, the new Commissioner reissued the same memo, again without punishment details.

The lack of information outlining rules about PED violations would prove to be an important omission for MLB in the late 1990's. During the 1998 season, two players, Mark McGwire and Sammy Sosa, were attempting to break a nearly forty-year-old record of total homeruns in a season. The chase was an amazing storyline for baseball and brought fans old and new to watch when the record would fall. Unfortunately, a great deal of negative attention was also on MLB because both McGwire and Sosa were accused of using PEDs. After enough pressure from media and fans, McGwire admitted using a substance known as "androstenedione" that was not a steroid, but would be turned into one through natural processes in the body (IIAF, 2009). McGwire went on to break the single season home run record, but was never formally punished for his admitted used of PEDs because there were no penalties in existence at the time.

One year after MLB's failure to properly punish McGwire and other players known to be using PEDs, a new organization was created to fight doping during international competitions outside of baseball. That organization was called the World Anti-Doping Agency (WADA), and would effectively and permanently improve athletic drug testing overnight. Headquartered in Montreal, the WADA strives to create a "world where all athletes compete in a doping-free sporting environment," (WADA, 2010). Primarily the WADA is entrusted by international sporting organizations to monitor the rules established in the World Anti-Doping Code, a "document harmonizing anti-doping policies in all sports and all countries," (WADA, 2010).

One unified testing body ensured that all athletes would be subject to the same types of testing and the results would not be clouded by bias.

Unfortunately for fans of American professional athletics, the WADA code was not adopted by organizations such as Major League Baseball (MLB), National Football League (NFL), and National Basketball Association (NBA). These organizations would instead, choose to deal with their doping internally by launching investigations aimed at quietly catching athletes who were using PEDs. By doing so, these organizations avoided media scrutiny and possible embarrassment if one of their star athletes tested positive for PEDs. Furthermore, they allowed grey area and time to determine which of the WADA's drugs they would consider a performance enhancer. This allowed organizations like MLB to not have punishments associated with tobacco use, as smokeless tobacco is widely used by players.

The new millennium started off in a positive direction against doping in the United States with the creation of the United States Anti-Doping Agency (USADA). The breadth of effectiveness was relatively small, however, because the USADA was only responsible for testing of US Olympic athletes. Specifically, the agency was to "develop a comprehensive national anti-doping program for the Olympic Movement in the United States," (USADA, 2001). Although the USADA would expand to include Pan Am and Paralympics athletes, it again failed to infiltrate the professional sporting organizations that had an obvious need for PED testing and compliance. The NFL, for example, did not adopt the USADA's policies because it already had a random steroid testing policy in place since 1990, and any policy change would need to be approved by the player's union (USA Today, 2007). Furthermore, the NBA had just added steroids to its banned substance list the year before the USADA was created, and did not want to place additional restrictions on its players (USA Today, 2007). Finally, the MLB, which had no

previous drug testing policy in force, decided to survey its players regarding their use of steroids citing that the surveys "were anonymous and penalty free," (USA Today, 2009). Results of the survey showed PED prevalence higher than previously assumed as nearly 6% of respondents reported PED usage (USA Today, 2009).

A major advancement in the fight against PED usage came in 2002 with the discovery of a designer steroid known as norbolethore (Anti-Doping Research, 2009). Norbolethore produced similar strength and endurance gains as steroids, but was undetectable at the time so athletes quickly learned of a new way to gain an advantage without getting caught. Those who could afford access to the new drug, and a medical professional to administer the drug properly, became invincible. The invincibility, however, quickly ended when Dr. Don Catlin revealed the designed steroid to the public. The revelation expanded steroid testing and limited the ability of some athletes to avoid detection of their usage (Anti-Doping Research, 2009).

Dr. Caitlin's research came on the heels of two major doping investigations in US athletics. The first dealt with alleged doping cover-ups by the US Olympic Committee. Between 1988 and 2000, more than 100 US Olympic athletes were cleared for competition despite testing positive for various PEDs (CBC, 2003). The second investigation in 2003, dealt with the many allegations of steroid use in Major League Baseball. The Bay Area Laboratory Co-Operative (BALCO) was raided by federal investigators to gather evidence regarding the suspected distribution of steroids to athletes, including 87 current and former MLB players (NPR, 2007).

Ten of those players were called to testify but none were punished by the MLB since no policy was in place at the time. The raid, combined with 7% of that year's anonymous tests returning positive PED results, prompted MLB to begin a random drug testing policy that

included punishments for positive results during the 2004 season (AP, 2010). The punishments, which were initially designed as counseling for a first offense and a 15-day suspension for a second offense, would later be increased to today's rate of a 50-game suspension for a first offense and 100-game suspension for a second offense with an additional option of lifetime banishment for any additional offenses (MLB, 2013).

Between 2004 and 2006, multiple laws and policies were established to deter all athletes, not just MLB players, from doping. The Anabolic Steroid Control Act of 2004 classified multiple steroid based drugs as Schedule III controlled substances (Fox News, 2007), which meant that athletes would need prescriptions to use many of the drugs on MLB's banned list. That same year, the International Olympic Committee (IOC) transferred control of its 192 banned substances list to the WADA (Anti-Doping Research, 2009). The WADA began its management of the list by removing caffeine as a banned substance claiming the excess levels of caffeine may lead to a drop in performance (Salleh, 2008). The removal was counterintuitive to the conventional assumption that the WADA would enact harsher penalties and add substances to the list of banned substances. WADA pioneered the ban on gene doping, which changes an athlete's DNA by injecting altered genes into the body to produce a gain while masking the usage of a PED (ProCon, 2013). After WADA banned gene doping in competition, the rule became a law with the passing of the Office of National Drug Control Policy Reauthorization Act of 2006, (HR 6344, 2006). This law further prohibited the use of genetic modification in athletic competition and allowed organizations to prosecute individuals who were found to be in violation.

Between 2007 and 2013 nearly thirty athletes from close to ten different sports were involved in doping allegations (ProCon.org, 2013). The heightened number of incidents was the

combination of increased PED enforcement and widespread media coverage of athletes accused of using PEDs. While punishments ranged from suspensions to jail time, only on rare occasions did athletes lose a considerable amount of money. The financial gain during the height of their PED laced careers far outweighed the punishment of public scrutiny associated with cheating. With sports contracts increasing in value to hundreds of millions of dollars, the only deterrent to PED usage may be an athlete's moral compass.

Although there have been multiple forms of PEDs throughout history, there is currently greater attention on them and their various forms due to increased regulation and definition of associated punishment. From liquid to solid, natural to synthetic, and legal to illegal, PEDs have infiltrated an array of athletics. One could argue that their effects are as much mental as they are physical, but for some athletes, any advantage is a good advantage. The question that still remains, however, is what should be considered a PED? The aforementioned examples prove nothing more than the fact that PEDs may be open to interpretation. Determining what today's society considers a PED is the next step in finding commonality in testing, which may lead to better enforcement of fair and healthy play for high school athletes.

Types of Performance Enhancing Drugs

Of the many drugs in existence today, the World Anti-Doping Agency (WADA) has specifically indicated and banned 192 performance enhancing methods and substances in a publication known as the "prohibited list, international standard," (WADA, 2013). Over 600 international sporting organizations have adopted the standard list to help enforce PED usage worldwide (ProCon.org, 2010). The list is divided into 12 major categories, with an additional category for sources. The categories, along with examples and effects, are outlined in figure 3 and chapter 2.

Figure 3. Categories of the WADA Doping Code as listed by ProCon.org (2010)

I. Anabolic Agents (56)
II. Hormones & Related Substances (7)
III. Beta-2 Agonists (1)
IV. Hormone Antagonists & Modulators (13)
V. Diuretics & Other Masking Agents (16)
VI. Stimulants (62)
VII. Narcotics (11)
VIII. Cannabinoids (1)
IX. Glucocorticosteroids (1)
X. Alcohol (1)
XI. Beta-Blockers (20)
XII. Banned Methods (3)
XIII. Notes & Sources

Figure 3. Categories of the WADA Doping Code by ProCon. (2010). 192 Banned Performance Enhancing Substances and Methods. Retrieved from ProCon website http://sportsanddrugs.procon.org/view.resource.php?resourceID=002037.

Category I details anabolic substances. The list of over 50 substances is further divided into three categories: Exogenous Anabolic Steroids, Endogenous Anabolic Steroids, and Other Anabolic Agents (WADA, 2013). Agents in this category can be taken orally or injected directly through the muscle tissue. Athletes typically use anabolic agents to increase strength and size of muscles (Procon, 2010). Regarding medical purposes, drugs in this category can be used to treat a variety of conditions from asthma to breast cancer (Procon, 2010). Athletes who suffer from conditions that require treatment from anabolic agents may have difficulty gaining approval from their sporting organization due to the heighten awareness of the performance enhancing effects of steroids. Furthermore, the negative health effects associated with anabolic agents can be numerous. Effects such as aggression, liver failure, and stunted growth cause many to argue whether the benefits are enough to outweigh the side effects.

Category II details hormones and related substances. The seven substances in this category include the widely discussed PED known as "human growth hormone" or HGH. HGH and other drugs from Category II enhance performance similar to anabolic agents, but are medically used to treat a much wider range of symptoms and diseases. Hormones can be used to enhance performance by increasing endurance, muscle recovery, and muscle size while reducing

body fat, protein breakdown, and inflammation (Procon, 2010). Medically, hormones can be used to treat conditions such as anemia, infertility, and diabetes (Procon, 2010). While some hormone drugs can be taken orally, the majority are injected directly into the muscle tissue.

Categories III and IV detail beta and hormone agonists and antagonists respectively, and describe drugs that increase or decrease naturally occurring chemical substances that affect such processes as growth, reproduction, and digestion (ProCon, 2013). Agents in both categories are taken via intramuscular injection (Procon, 2010). Both beta agonists and hormone antagonists enhance performance by increasing muscle strength, but beta agonists have an added enhancement of improving aerobic exercise levels (Procon, 2010). While both categories are similar in their performance enhancing characteristics, the symptoms they treat are vastly different. Beta agonists focus on the treatment of lung related symptoms such as asthma and chronic obstructive pulmonary disease (Procon, 2010). Hormone antagonists are mainly used to treat the symptoms associated with breast cancer and female infertility (Procon, 2010). Although the benefits of such agents may lessen the side effects of steroids, the side effects connected to Category III and IV drugs, including irregular heart beat and cancer, may cancel out any advantage they have produced.

Category V details diuretics and other masking agents which hide the presence of PEDs so athletes can avoid banned substance detection (ProCon, 2013). Agents in this category can be taken orally, but the majority are injected directly into the muscle tissue (Procon, 2010). Diuretics indirectly enhance performance by masking the presence, or concentration, of other known banned substances (Procon, 2010). Category V agents can be used medically to treat symptoms related to heart failure and high blood pressure (Procon, 2010). Risks of using diuretics are minimal compared to other banned substances, but many athletes who use diuretics

may use other PEDs concurrently. This cocktail of drugs may dramatically enhance performance, but the combined health risks could prematurely end an athlete's playing career.

Category VI details stimulants. The list of over 60 stimulants includes adrenaline and cocaine. Caffeine is not included on the list of banned substances because too much caffeine is thought to decrease performance (WADA, 2013). Agents in this category can be taken multiple ways including orally, via inhalation, intranasal, or injected directly into the muscle (Procon, 2010). Stimulants directly enhance performance by increasing an athlete's alertness and responsiveness while decreasing the effects of fatigue (Procon, 2010). Common medical conditions such as allergies, asthma, and the common cold can be treated with stimulants; therefore athletes must be cognizant when seeing a doctor before competition. Stimulants were once believed to have little or no health effects, but recent increases in heart-attacks and complications in young adults have shed new light on the negative side effects of using stimulants such as caffeine in excess (Seifert, Schaechter, Hershorin, & Lipshultz, 2011).

Category VII details narcotics. The relatively short list of drugs includes heroin, morphine, and oxycodone. Agents in this category can be taken orally or injected directly into the muscle or vein (Procon, 2010). Narcotics from Category VII enhance performance by blocking pain receptors and creating a feeling of invincibility within the athlete (Procon, 2010). Most narcotics are also used in the medical arena to combat pain, but the possibility of addiction and/or withdrawal associated with these drugs also poses a mental risk. Furthermore, an athlete who does not feel pain may not be able to prevent further injury that could result in a shortened playing career and possibly lifelong debilitation.

Category VIII details cannabinoids. Agents in this category are more commonly referred to as "marijuana" and can be taken orally or inhaled (Procon, 2010). Depending on the athlete's

reaction to the drug, marijuana can create a euphoric sensation or have a calming effect on a person. A growing list of symptoms can be treated with the use of medical marijuana, but depending on the state of residence, legal accessibility may be limited to many players. Some may argue that the use of marijuana is safer than alcohol and therefore should not be included on the banned substance list. Further research on the long term health effects of prolonged marijuana usage in athletes would need to be presented to WADA before changes in the banned substance list are made.

Category IX details glucocorticosteroids. Agents in Category IX can be taken orally, rectally, via inhalation, intravenously, or via intramuscular injection (Procon, 2010). Glucocorticosteroids act as a performance enhancer by reducing inflammation in joints and muscles (Procon, 2010). Severe cases of arthritis and certain allergic reactions can be treated with glucocorticosteroids, but the risk or musculoskeletal problems increase with extended usage (Procon, 2010). Painful inflammation will typically improve once the area is allowed to rest for a period of time. Unfortunately, many athletes do not have the desire or ability to take time off and must rely on balms or creams to help with everyday soreness. When over-the-counter remedies do not work, a glucocorticosteroid may be their last resort.

Category X details alcohol. Alcohol may come in a variety of types and flavors, but the actual banned substance is ethanol. Ethanol is consumed orally and enhances performance by reducing anxiety and creating a sedated state in the athletes (Procon, 2010). As with many drugs, the amount of alcohol consumed before performance enhancement varies from athlete to athlete. Therefore, WADA tests blood alcohol levels to account for difference in height, weight, and gender. The threshold for alcohol violation is 0.10g/L, which is higher than what most states consider “legally intoxicated” (WADA, 2013). Short term side effects of alcohol use are minor

compared to long term abuse of the substance. Cirrhosis of the liver, depression, and death are major conditions associated with alcohol abuse (Procon, 2010). While alcohol may not be used by most athletes on the field, some may turn to it to escape the pressures associated with the industry of professional athletics.

Category XI details beta-blockers. Similar to alcohol, beta blockers are taken orally and provide a sedative-like effect for performance enhancement (Procon, 2010). Beta blockers can help with muscle tremors, but are used medically to treat symptoms associated with anxiety, high blood pressure, and migraines (Procon, 2010). The side effects of beta blockers, including low blood pressure and tiredness, may create as many problems for athletes as the original symptoms they were diagnosed to treat. Finding a perfect balance may be difficult for some athletes, which may be why beta blockers are included on the banned substance list.

The final category details banned methods associated with PED usage. Category XII includes three main methods: blood doping, manipulation, and gene doping (Procon, 2010). Each of the aforementioned methods enhances athletic performance without directly using drugs. Blood doping is the "misuse of certain techniques and/or substances to increase one's red blood cell mass, which allows the body to transport more oxygen to muscles and therefore increase stamina and performance," (WADA, 2013). Manipulation includes chemical or physical tampering of samples to mask or replace a potential positive drug test (WADA, 2013). Finally, gene doping is "the non-therapeutic use of genes, genetic elements and/or cells that have the capacity to enhance athletic performance," (WADA, 2013). Detection of method usage may be more difficult than drug usage, but the implementation by the athlete takes more time than simply ingesting or injecting a drug into their system.

While WADA list is extensive and accepted worldwide, it has not been recognized in many American professional sporting leagues. Specifically Major League Baseball (MLB), the National Football League (NFL), and the National Basketball Association (NBA), have not adopted the WADA's list (ProCon.org, 2010). Instead, these organizations create their own list of substances and testing procedures through a collective bargaining agreement between players' union representatives and team owners. Procedures and punishments vary between leagues and are outlined in the next section.

Professional and College Athletic Policies

After many years of having no drug testing policy in force, MLB decided to survey its players regarding their use of steroids citing that the surveys "were anonymous and penalty free," (USA Today, 2009). The survey yielded high enough results that MLB was prompted to begin a random drug testing policy that included punishments for positive results during the 2004 season (AP, 2010). The punishments, which were initially designed as counseling for a first offense and a 15-day suspension for a second offense, would later be increased to today's rate of 50-game suspension for a first offense and 100-game suspension for a second offense with an additional option of lifetime banishment for any additional offenses (MLB, 2013). Since its implementation in 2004, 56 players have been suspended a combined 2406 days for violations of the Joint Drug Prevention and Treatment Program (AP, 2013).

The National Football League (NFL), in association with the NFL Players Association (NFLPA), has created a drug policy in which players must adhere. The latest version of the "Policy and Program for Substances of Abuse" details 35 pages of policy associated with testing, intervention, and punishment of substance violations by NFL players (NFLPA, 2010). Players are tested once during pre-season activities, and then randomly throughout the season. Players

who test positive, or are suspected of using PEDs, may be tested on a routine basis. Positive tests will place players in a set of three intervention stages which increase the frequency of random testing with each stage of progression (NFLPA, 2010). Failure to complete interventions may result in punishments ranging from verbal warnings to lifetime banishment from the NFL. Although athletes are tested for anabolic steroids during the yearly pre-season test, at no other time are they specifically tested for steroid usage unless suspected of a violation. Furthermore, a search of the 35 pages of the NFL drug policy found that the term "steroids" was listed only once in the entire document.

Similar to the NFL's substance abuse policy, the National Basketball Association (NBA), in association with the National Basketball Players Association (NBPA), has also created a drug testing policy for its athletes. The "Anti-Drug Program" is Article XXXIII of the NBPA collective bargaining agreement, and details 43 pages of policy (NBPA, 2009). Per the policy, the NBA and NBPA jointly select a medical director in charge of "implementation of the program, evaluating and treating players subject to the program, and for otherwise managing and overseeing the program," (NBPA, 2009, p.359). Players can be randomly tested up to four times per season, but can also be tested at any time if league officials have reasonable suspicion of PED usage (NBPA, 2009). Violations of the policy could result in up to a one-year suspension and mandatory enrollment in a treatment program (NBPA, 2009). The treatment program consists of two intervention stages designed to increase testing and rehabilitation with each stage in order to justify a player's re-entry into the league (NBPA, 2009). Failure to enroll and/or complete the stages of intervention will result in dismissal from the NBA (NBPA, 2009).

The National Collegiate Athletic Association (NCAA) has a drug testing policy that is effective in all three of its divisions' athletics. The testing, which began in 1986, was expanded

to its current format in 1990 and includes three levels of testing (NCAA, 2013). The first level, titled "championship testing," tests athletes before championship events every five years at minimum while testing nearly 2500 athletes throughout the year for performance enhancing drugs (NCAA, 2013). Level two, titled "year-round testing," tests approximately 11,000 athletes for some of the more well-known PEDs such as steroids and hormones (NCAA, 2013). Level two does not test in the lowest division of NCAA, Division III, which may open the door to increased usage in athletes at that level. Finally the third level, titled "school-sponsored testing," allows some schools to provide their own testing programs (NCAA, 2013). Implementations and procedures are not governed by the NCAA and schools are not required to report their findings to the NCAA (NCAA, 2013). Since level three is in addition to the two administered by the NCAA, schools who participate in their own testing programs may be looking for advanced notice of any violations by their athletes as self-imposed punishments and/or restrictions are sometimes less severe than those imposed directly by the NCAA.

As the level of competition decreases from professional to college athletics, so too does the levels of punishment and testing procedures implemented on athletes. Further reduction, if not elimination, of testing occurs at the high school level. The possible lack of policing may lead some high school athletes to abuse performance enhancing drugs because there is often no punishment for doing so. The long-term health risks associated with many PEDs may not be enough of a deterrent for a young adult focused on the near future. Only four states have implemented drug testing of high school athletes. Details regarding legislation and studies related to the success or failure of high school athletic PED testing are outlined in the next section.

High School Legislation

Any time discussions regarding the implementation of drug testing on minors occur, the legality of testing may be an issue. Parents, students, administrators, and Board of Education members all play vital roles in not only the implementation of drug testing, but also the success or failure of the policy. Complete buy-in and flawless execution of a drug testing policy may be impossible, but eliminating legal issues may ease most of the obstacles that come with initial enactment of drug testing. Multiple bills and legislations have been implemented over the last 30 years regarding this issue. The following section outlines some of the major State and Federal court rulings that have impacted the future of high school athletic PED testing.

The most notable Federal legislation regarding drug testing of minors is actually hidden within a commonly known educational policy. The 2002 "No Child Left Behind Act" (NCLB) signed into law by President George W. Bush contains a section specific to drug testing (H.R 1 Education Act, 2002). Title IV of the act allows states to apply for federal grants that help pay for drug testing programs (US Department of Education, 2013). While drug testing in high schools existed before NCLB, the government's funding of testing programs allowed more schools to afford testing and may have directly led to four states implementing bills to legalize drug testing in all public schools. The four states include Virginia, New Jersey, Florida, and Texas, and have been the subject of multiple lawsuits as a result. Seventeen of the most notable state cases regarding drug and alcohol testing in public schools will be reviewed to determine commonalities to better discover the benefits and disadvantages of drug testing at the high school level.

One of the first cases regarding student drug testing came well before Title IV of NCLB when a New Jersey school district began urinalysis testing of all students to determine the

prevalence of drug usage. The policy was challenged and ultimately taken to the New Jersey Superior Court which resulted in a ruling against the district on the basis of lack of reasonable suspicion and failure to provide due process (Odenheim v. Carlstadt, 1985). The case became a springboard for future lawsuits against school districts wanting to implement student drug testing policies. Three years after Odemheim v Carlstadt (1985), an Indiana school district was brought to trial for implementing a student drug testing policy (Schaill v Tippecanoe County School Corporation, 1988). Tippecanoe County School Corporation's policy, however, differed from Carlstadt's. First, Tippecanoe based the implementation of their policy on nationwide and inter-district studies, thus legitimizing the need for a drug testing policy. Second, the district focused on testing of athletes as opposed to the entire student body. Finally, if athletes tested positive, they were allowed to explain the results in order to avoid punishing athletes with medical needs. Because of the changes in Tippecanoe's drug testing policy, the court ruled to uphold the policy (Schaill v Tippecanoe County School Corporation, 1988).

The back and forth of ruling for and against drug testing policies continued throughout most of the 1990's, beginning with an Appellate court ruling in 1991. A federal court found East Chambers Consolidated School District's policy of drug testing students in extra-curricular activities unconstitutional (Brooks v East Chambers Consolidated School District, 1991). The Texas school district failed to show a large population of students were using drugs and excluded students from activities if they refused to participate in the test (Brooks v East Chambers Consolidated School District, 1991). The lack of due process combined with a lack of reasonable suspicion led to the ruling against East Chamber.

Four years later, the Supreme Court ruled in favor of a district's drug testing policy. Oregon's Vernonia School District implemented a drug testing policy on all student athletes after

an external study showed athletes as the largest population of drug users in the district (Vernonia School District v Wayne Action et ux, 1995). When one student was excluded from athletic participation for refusing to submit a drug test, a lawsuit was filed by the student's parents. After multiple courts had heard the case through appeals, the final ruling was in favor of Vernonia based on the district's reasonable suspicion drawn from the external study (Vernonia School District v Wayne Action et ux, 1995).

Rulings in favor of districts' drug testing policies continued in 1998. After a policy was implemented requiring extra-curricular activity students, and their parents, to consent to random student drug testing, four parents sued Rush County School District (Todd, et al. v Rush County Schools, 1998). The policy was enforced after an external study found drug and alcohol usage at Rush County High Schools higher than the state average (Todd, et al. v Rush County Schools, 1998). Based on the external study's results, the district had reasonable suspicion to enforce a drug testing policy and was backed by a Federal Court in their ruling.

Additionally, in 1998 a Colorado School district brought the concept of reasonable suspicion into the courtroom. The Trinidad School District of Colorado implemented a mandatory, suspicion-less, drug testing policy on all middle and high school students participating in extra-curricular activities (Trinidad School District No.1 v Lopez, 1998). A lawsuit was brought to trial when one student was suspended from participating in band after refusing to consent to urinalysis testing (Trinidad School District No.1 v Lopez, 1998). Parents of the student argued that his academic standing could be affected by the drug policy and therefore refused to consent (Trinidad School District No.1 v Lopez, 1998). Since band specifically was not a voluntary activity, the court ruled in favor of the parents but upheld the rest of the policy not associated with a grade (Trinidad School District No.1 v Lopez, 1998).

Similarly, Miller v Wilkes (1999) upheld random drug testing on the grounds that extra-curricular activities were voluntary.

One of the final high school drug policy cases of the last millennium occurred in Indiana. Every other year the Penn-Harris-Madison School Corporation of Northern Indiana surveyed sixth through twelfth grade students on their drug use (Joy v Penn-Harris-Madison School Corporation, 1999). In response to the results, the school board set up a committee, created a task force, and implemented a "suspicion-less" drug testing policy for all students (Joy v Penn-Harris-Madison School Corporation, 1999). A motion was filed by parents against the district for violating their students' due process. The court, however, upheld the district's policy on all but one area; student drivers were not punished for tobacco tests (Joy v Penn-Harris-Madison School Corporation, 1999).

The majority of high school drug testing policy rulings in the early 2000's were upheld by district and federal courts. However, a Northern Texas district saw their policy overruled due to lack of procedural preparation. Lockney Independent School District surveyed teachers and found a "strong desire" to create a drug testing program for all students (Tannahill v Lockney Independent School District, 2001). The survey's results led to the district's Board of Education implementing a drug testing policy and distributing parental consent forms with testing to begin the following month. The testing, which also included staff members, was found unconstitutional because there was no evidence that a drug abuse problem existed within the district (Tannahill v Lockney Independent School District, 2001). Furthermore, testing all students was considered "intrusive" and "unreasonable" on the student population (Tannahill v Lockney Independent School District, 2001). Suspicion-less testing also led to a ruling against Tecumseh, Oklahoma's District #92, but a Supreme Court ruling overturned the lower court

ruling and upheld the random testing policy (Board of Education Independent School District #92 of Pottawatomie v Earls, et al., 2002).

Fourteen years after Schaill v Tippecanoe County School Corporation (1988), another Indiana school district was taken to trial over a drug testing policy. Northwestern School Corporation, following Tippecanoe's utilization of the Indiana Prevention and Resource Center's student drug survey, created a task force a drug testing policy for their high schools (Linke v Northwestern School Corporation, 2002). The policy was not punitive as there was no academic penalty, no documentation of drug testing in academic records, and results were not disclosed to local authorities (Linke v Northwestern School Corporation, 2002). The policy did, however, exclude students from extra-curricular activities if they tested positive or failed to consent to testing (Linke v Northwestern School Corporation, 2002). Parents of students in the district argued that this violated search and seizure clauses, but ultimately lost their appeal to the Indiana Supreme Court.

In 2002, two more student drug testing policy cases were decided in favor of school districts. First, parents of an Oregon high school student filed suit against their school district for violating the privacy of their daughter by forcing her to disclose any prescription medication usage (Weber v Oakridge School District 76, 2002). The disclosure was part of a new drug testing policy that required students to consent to random drug testing if they wished to participate in extra-curricular activities (Weber v Oakridge School District 76, 2002). While the court agreed with the plaintiffs in regards to privacy violations, it upheld the policy in all other aspects (Weber v Oakridge School District 76, 2002). The school district eliminated the medication disclosure clause, and was able to keep the rest of the policy in force.

A case in 2002 allowed a New Jersey school district to keep its drug testing policy. The Hunterdon Central Regional High School had concerns about student drug and alcohol use. A survey by the Rocky Mountain Behavioral Science Institute Inc. (RMBSI), however, resulted in less than 5% of students testing positive for drug or alcohol use (Joye v Hunterdon Central Regional Board of Education et al., 2002). Advocates of a drug testing policy argued that the survey deterred some athletes from using drugs and/or alcohol, and was proof that a full scale policy would be effective. Public opinion, combined with local law enforcement data, led to the creation of a drug testing program that included all extra-curricular activities and parking permits (Joye v Hunterdon Central Regional Board of Education et al., 2002). After two years of litigation, the New Jersey Superior Court ruled in favor of the school district and the policy was kept in force.

Finally in 2003, a second case against a Texas school district resulted in not just a drug testing policy being upheld, but much more. After Tulia Independent School District implemented random drug testing for students wishing to participate in extra-curricular activities, a suit was filed (Bean v Tulia Independent School District, 2003). The suit was ultimately dismissed but the plaintiff, the father of a student, was ordered to pay the school's taxable court costs (Bean v Tulia Independent School District, 2003). While an appeal has not yet been filed, the ruling has limited many future cases against school districts simply because most parents do not have the financial ability to challenge a school district in court.

The passing of NCLB, specifically Title IV, combined with the ability for school districts to recoup court costs appears to have virtually eliminated future law suits against drug testing policies in high schools. There were, however, policies and recommendations to reduce drug usage implemented by multiple organizations that are continually updated today. The two most

notable, in regards to this study, are the Nebraska School Activities Association (NSAA) and the National Federation of State High School Associations (NFHS). Both organizations have policies on PED usage, but no formal punishment has been established for student athletes who test positive.

The NSAA follows the NFHS policy on steroids which states that "The NFHS strongly oppose the abuse of anabolic steroids and other performance-enhancing substances by high school student-athletes. Such use violates legal, ethical and competitive equity standards, and imposes unreasonable long-term health risks," (NFHS, 2012). Furthermore, the statements on specific PEDs such as energy drinks and dietary supplements are "strong recommendations" against their usage, and even aligns with the Food and Drug Administration's (FDA) classification of dietary supplements as "food" instead of a drug so they are not subject to stricter testing and regulations (NFHS, 2011). A "please do not cheat" approach to controlling a potentially serious physical and ethical epidemic is a far cry from a solution.

The aforementioned cases have multiple items in common that play large roles in the legality of implementing drug testing policies in high schools. Among these are: 1) Policies must be derived by reasonable cause or suspicion. 2) Simply implementing a drug testing policy for sake of gathering data is not enough. An outside agency can provide survey data to each school or district that would justify further inquiry. 3) If data suggests concerns with student drug or alcohol abuse, then districts can establish a task force including, but not limited to: administration, board of education members, parents, and teachers. This group would then develop a drug testing policy that would best suit the needs of the district and its students. 4) The policy must not punish a student's academic standing and information from testing may not be released to the public as minors and medical information are both protected by law.

5) Finally, testing usually consists of random urine analysis, but further lab results can be established on a need-by-need basis. Cost and time restrictions prevent testing all students with a full toxicology report.

When the above similarities between cases are not followed by districts, the courts tend to rule in favor of parents who are suing on behalf of their children. The cases appear to be equally divided between parents who are covering for their children's poor decisions or standing up for their constitutional rights. The 4th and 14th amendments were commonly referred to in almost all of the court cases. The right against unreasonable searches and the right to due process respectively, were used by attorneys in court cases. Many of the school's drug testing policies involved selecting random students without reasonable cause/suspicion to be tested (Cornell Law, 2013). The legality of drug testing, however, may not be the only issue with which parents are concerned as prevalence of teenage PED usage may be on the rise.

Teenage PED Usage

In comparison to the many documented incidences of PED usage by professional athletes, many studies have linked teenage drug use with a variety of physical and mental consequences. High school athletes at the height of their developmental years may be under pressure to keep up with other athletes who are physically developing at a faster pace. Even if the athlete knows the risks associated with PED usage, the individuals who may be most uninformed are parents. A 2005 survey of high school students and their parents reported that while 35% of students admitted to using or observing others use drugs, only 15% of parents assumed drug use occurred (PRIDE, 2005). The lack of parental assumption of high school student drug usage may be a reason for low testing implementation at the high school level.

Furthermore, the majority of parents who assume there is no problem may also be unaware of the dangers associated with any drug usage, let alone PED.

Multiple studies have associated the use of drugs with poor academic performance. Three specific cases were reviewed by the researcher. Kreamer, Fields, Stutman, Anderson, and Barthwell (2008, p.2) specifically noted a "clear correlation between drug use and declining academic performance." The 2008 study reported a flaw that existed with No Child Left Behind is the inclusion of high school students who abuse drugs. Kreamer et al.(2008) argued that in comparison to other countries, including students who abuse drugs brought our overall academic scores down and funneled funding and time towards the wrong population. The large population of drug-impaired high school students "undermines our country's ability to compete on the world stage," (Kreamer et al, 2008, p.2).

The United States Department of Health and Human Services' (USDHHS) National Survey on Drug Use and Health (NSDUH) also provides evidence linking drug use and poor academic performance. The results of a 2004 survey, focusing on alcohol and marijuana use, show correlations between decreased academic performance in relation to the frequency of drug usage (USDHHS, 2006). Specifically, less than 50% of students who used marijuana for five or more days still kept an A or B average compared to over 70% of students who did not use marijuana (USDHHS, 2006). Results were similar when students were surveyed regarding alcohol use. Students who used alcohol were nearly 15% less likely to report an A or B average (USDHHS, 2006). Results from the USDHHS' 2006 study were supported by a similar survey from Pride Surveys. The 2006 Pride study reported nearly 40% of students using marijuana and 50% of students using alcohol had "poor" academic performance (PRIDE, 2005). Furthermore, students who used marijuana and/or alcohol accounted for the majority of behavioral referrals in

schools participating in the study (PRIDE, 2005). Unfortunately, poor academic performance and behavioral referrals were just the beginning of problems for some students.

Studies by the United States Office of Applied Studies (OAS) and the United States Office of National Drug Control Policy (ONDCP) provided evidence of a link between increased use of drugs and alcohol and violence. Higher rates of alcohol use were reported with increased violent behaviors in youth aged 12-17 (OAS, 2005). Specifically, over 65% of youth aged 12-17 who reported "heavy alcohol use" also "engaged in one or more delinquent behaviors" including fighting (OAS, 2005, p. 2). The ONDCP reported similar figures regarding marijuana use. Marijuana users broke school rules including physically attacking others (ONDCP, 2006). The physical attacks were also proportional to the amount of times the student used marijuana (ONDCP, 2006).

Drugs and alcohol, however, may not play a direct role in violence or academic decline. Instead, many doctors, including Dr. Daniel Amen, use brain scans to show how the physical effects of prolonged drug and alcohol abuse may lead to violence and poor academic performance. Specifically, Single-Photon Emission Computerized Tomography, or SPECT (Mayo Clinic, 2011), images from Dr. Amen's study show many abnormalities including less activity and an overall unhealthy appearance (Amen, 2001). The images (Figure 4) show defects that are not only common in patients who abuse marijuana, but also patients who have been deprived of oxygen (Amen, 2001). These patients may begin a pattern of abuse at an early age that could be prevented if drug testing at the high school level led to specific actions against usage.

Figure 4. PET scans of marijuana use

Figure 4. PET scans show long-term changes in glucose-metabolism in the brain of a marijuana abuser compared to that of a normal brain. Image courtesy of Brookhaven National Laboratory Center for Imaging and Neurosciences, Behavioral, Pharmacology & Neuroimaging Lab, Upton, New York by Amen, Daniel G. (2001)

If patterns of abuse prove to be most detrimental, a determination must be made to prove such a pattern exists. To determine if a pattern of abuse existed, researchers from the University of Michigan selected high school students who completed a drug and alcohol survey to participate in a follow-up survey every two years (Merline, O'Malley, Schulenberg, Bachman, Johnston, 2004). The students, who graduated between 1977 and 1983, were surveyed over an 18-year period. Results indicated students who began abusing substances at an early age were more likely to continue using later in life. Specifically, students who abused marijuana, alcohol, and illicit drugs were three to eight times more likely to abuse those items at age 35 (Merline et al, 2004). Furthermore, mental illness appears to be correlated with a pattern of marijuana use. The NSDUH found an increased risk of psychological disorders among those who began using marijuana before their teenage years (OAS, 2004). Mental illness combined with hormones and partial frontal lobe development common among teenagers, could affect decision making skills that include taking PEDs.

On-field punishments may be the least of a player's concern as the long-term effects on his/her physical and mental health may be debilitating. While parents may ultimately be responsible for monitoring their child's wellbeing, coaches often spend more time with high

school students and have more of an impact on their lives than parents. Coaches may be more responsible for player safety, mentally and physically, than parents. Therefore, it is important to establish a baseline of opinions from high school coaches regarding implementation and testing of high school athletes. Literature regarding this very opinion, however, appears to be lacking.

Current Coaches' Perspectives

Current studies regarding testing high school athletes for performance enhancing drugs are limited in their opinions from a specific group of individuals/coaches. Coaches often spend hours before and after school training and teaching athletes to be at their best during competition, therefore any decision to implement testing or punishments associated with PED usage would impact high school coaches as much as it would their athletes. Outside agencies define PED's, determine how to implement testing, and also have a hand in establishing the natural consequence of a positive test. The outside agencies often disregard high school coaches' knowledge on what would be best regarding the consequence and participation in the specified sporting event. The small number of studies including perspectives from high school coaches represents a need for a study that factors in their thoughts regarding the classification, testing, and punishment associated with performance enhancing drug use by high school athletes.

Summary

A review of literature indicates historical examples of PED usage, types of PEDs, current laws and regulations associated with PED testing, examples of PED high school legislation, and an overview on the need for additional opinions from high school coaches. PED usage in high school athletics may be a product of many different factors, but the majority of these factors illuminated a need for continuity in performance enhancing drug testing and education. Testing methods, drugs allowed, and punishments differ in all level of athletics; the majority of high

school athletes are not tested for any type of PED usage. Parents, administrators, and even athletes have given input into past PED testing initiatives, but coaches' opinions remain an afterthought. Utilizing the individuals involved in athletes' day-to-day activities may give better insight into not only if PED should be tested for in high school athletics, but what drugs should be tested for and what level of punishment to implement if a positive test is acquired. Agreement between coaches is the first step in a comprehensive testing plan of PED usage in high school athletics.

CHAPTER III: METHODS AND PROCEDURES

Method

The purpose of this chapter was to outline the research methods and data collection procedures used to determine if differences existed between high school athletic coaches of certain demographic categories and their opinions regarding the classification, testing, and punishment associated with performance enhancing drug use by high school athletes. During analysis, the independent variables for the sample of high school athletic coaches were gender, years in high school coaching, paid versus volunteer status, grade level(s) coached, and sport(s) coached. Dependent variables for the sample of high school athletic coaches included personal classification of performance enhancing drugs (PEDs), level of desire to implement testing of PEDs, and opinion on punishment levels associated with assumed PED testing. Analysis was based on the participants' results of an administered survey.

To determine if differences existed between variables, the researcher conducted a quantitative research study by analyzing results of an electronic survey completed by high school athletic coaches (see Appendix A for coaches' electronic survey). The electronic survey contained a series of questions related to demographic information of high school athletic coaches, in addition to their opinions regarding the classification, testing, and punishment associated with performance enhancing drug use by high school athletes.

Quantitative designs are used to "seek explanations and predictions that will generalize to other persons and places" (Leedy & Ormrod, 2010, p. 95). This approach was selected because the researcher believes "there is an objective reality," "questions are confirmatory and predictive," and the "desire for structure is high" (Leedy & Ormrod, 2010, p. 107). This particular study utilized a quantitative design by statistically analyzing high school athletic coaches' answers to an electronic survey. Analysis included descriptive statistics, Chi-square,

and ANOVA. The statistics will be discussed in detail in the data analysis section. Frequency of events may be part of the electronic survey, however the researcher was specifically looking for possible differences that may have existed between variables without "probing for casual reasons underlying them" (Leedy & Ormrod, 2010, p.108). Quantitative methodology was combined with statistical analysis to determine if differences were present. Based on the results of the statistical analysis, training and educational changes related to PEDs may be recommended for high school athletic coaches.

Figure 5. Research Design

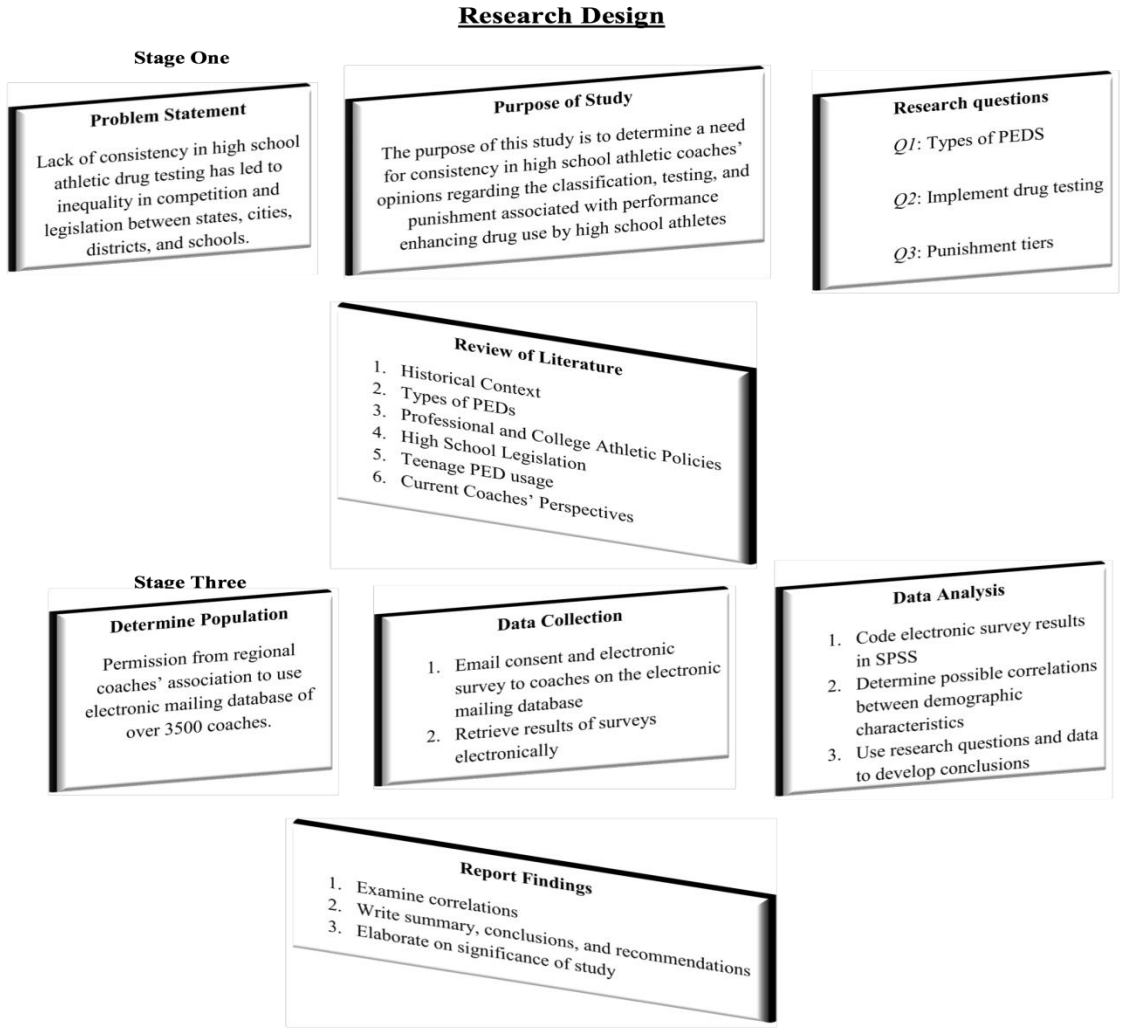


Figure 5. Design of research by Greco (2014).

Sampling and Demographics

A sample of high school athletic coaches were invited to complete one electronic survey. From the electronic survey, the researcher gathered data that included demographic information of high school athletic coaches in addition to their opinions regarding the classification, testing, and punishment associated with performance enhancing drug use by high school athletes. Purposeful sampling design allowed the researcher to focus on the responses of high school athletic coaches. The total sample was determined by an electronic mailing list provided by a regional coaches' association. From the total sample, no formula was used to determine a total sample size, therefore Sue & Ritter (2013) suggest a sample size of between 30 to 500 participants, or 10% of the parent population (see figure 6). If an appropriate number of participants was not obtained, the researcher would have selected another regional coaching association in close proximity to the original association in order to stay within the possible influence of Midwest high school athletic coaches' training.

High school athletic coaches varied in age, gender, experience, sports coached, and level coached. This differentiation ensured the sample population represented the general population of high school athletic coaches within the participating area. Participants were informed that their answers would be anonymous.

Figure 6. Sampling flow

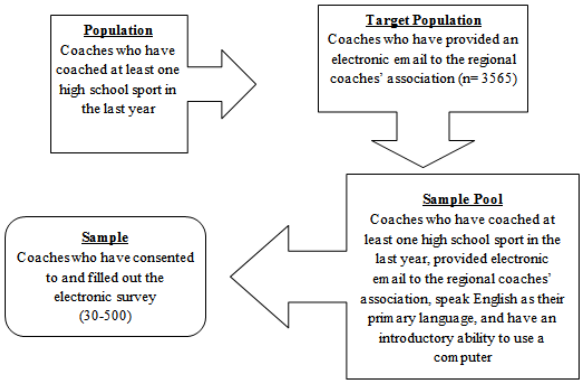


Figure 6. Participant flow chart created by researcher Greco (2014).

Data Collection and Procedures

Data collection for this study was in the form of an electronic survey. The electronic survey was newly designed for this study and required review to test for validity and reliability of questions. Content validity is "when the instrument used is designed to accurately measure the concepts under study" (Heavey, 2011, p.48). To increase the content validity of the electronic survey, the researcher provided the electronic survey to ten high school athletic coaches. These coaches reviewed the electronic survey for clarity, accuracy, and flow.

Reliability of this study is the "consistency with which a measuring instrument yields a certain result when the entity being measured has not changed" (Leedy & Ormrod, 2010, p. 29). Specifically, the readability of the electronic survey should be assessed to ensure participants can understand and accurately complete the electronic survey (Heavey, 2011, p. 51). To increase the readability of the electronic survey, the researcher provided the electronic survey to ten high school athletic coaches. These coaches reviewed the electronic survey for clarity, accuracy, and flow. Furthermore, the researcher replicated the delivery, instruction, and procedures associated with the actual study participants to ensure perspicuity.

Data collected from the electronic survey included high school athletic coaches' personal demographic information and opinions regarding the classification, testing, and punishment associated with performance enhancing drug use by high school athletes. Demographic data regarding years in coaching was measured on a continuous variable scale as participants answered by inputting a value into a text box and that value may "...have an infinite number of potential values and... falls somewhere on a continuum..." (Heavey, 2011, p.4). Demographic data regarding gender, paid versus volunteer status, sport(s) coached, and grade level(s) coached was measured on a categorical variable scale because of the "finite number of classification

groups that are qualitative in nature," (Heavey, 2011, p.6). A Likert scale was chosen to numerically represent respondents' answers to opinion based questions as it is used to measure attitude or interest on a continuum (Leedy & Ormrod, 2010). An ordinal Likert scale of 1 representing "warning" to 5 representing "lifetime suspension" was used with questions related to participants' opinions of punishment levels associated with positive PED tests.

Responses to each electronic survey question were coded into the Statistical Package for Social Sciences (SPSS) program for data analysis. Data for each of the independent variable categories of gender, years in high school coaching, paid versus volunteer status, grade level(s) coached, and sport(s) coached was compared to the dependent variables of personal classification of PEDs, level of desire to implement testing, and opinion on punishment levels associated with assumed PED testing.

High school athletic coaches who agreed to participate in the study electronically completed a survey containing questions that best represented their population while addressing the hypothesis and research questions presented by the researcher. All data gathered from the study will be stored for a minimum of seven years after publication of the study as recommended by Shamoo and Resnik (2009). Data storage "is crucial to ensuring accountability in research and to keeping a proper paper trail for management and for other future interested parties to authenticate the data" (Shamoo & Resnik, 2009, p. 44).

Utilizing the electronic survey, the researcher addressed the following questions:

Q1: What do high school athletic coaches of certain demographic categories consider a PED?

Q2: Do high school athletic coaches of certain demographic categories wish to implement drug testing on high school athletes?

Q3: Are there differences among high school athletic coaches' views, based on demographic categories, on punishments for a student athlete's positive performance enhancing drug test?

Research questions were addressed in the electronic survey given to each coach. Numerical data was analyzed to determine if differences existed between variables. If differences between variables were found, causes of opinions regarding the classification, testing, and punishment associated with performance enhancing drug use by high school athletes would not be discussed, because "evidence of a relationship between variables does not mean there is a causal relationship" (Urdan, 2010, p. 83).

Data Analysis

Utilizing the SPSS statistical analysis program, data analyses was conducted on the results of the electronic survey. The analysis was conducted to determine if differences existed between high school athletic coaches' demographic categories and their opinions regarding the classification, testing, and punishment associated with performance enhancing drug use by high school athletes.

During analysis, the independent variables for the sample of high school athletic coaches was gender, years in high school coaching, paid versus volunteer status (coaching designation), grade level(s) coached, and sport(s) coached. Dependent variables for the sample of high school athletic coaches included personal classification of performance enhancing drugs (PEDs), level of desire to implement testing of PEDs, and opinion on punishment levels associated with assumed PED testing.

Demographic information obtained from the electronic survey was quantitatively analyzed using descriptive statistics. A summary of descriptive statistics was used to determine

if differences existed between independent variable groups. Chi-square analysis was performed with "independent samples of nominal or ordinal-level data," (Heavey, 2011, p.106). Chi-square analysis was used because demographic information related to gender, paid versus volunteer status, and sport(s) coached will be collected on a nominal scale. An ANOVA was performed for each of the dependent variables to determine if there are differences between the independent variable groups and to reduce the risk of a type I error which multiple t-tests could result (Heavey, 2011).

Statistical significance was determined by setting the alpha level at .05, the power at .80, and utilizing a two tailed test. An alpha level of .05 was be used because "the agreed upon probability of .05 represents the type I error rate that researchers are willing to accept before we conduct our statistical analysis," (Urdan, 2010, p.66). A power level of .80 was used as "most studies typically consider 80% power as adequate," (Heavey, 2011, p.90).

Figure 7. Research Question/Data Analysis Pairing

Research Question	Survey Question(s)	Data Analysis
Q1: What do high school athletic coaches of certain demographic categories consider a PED?	Demographic information Which of the following would you consider a performance enhancing drug?	Summary of descriptive statistics Chi-square
Q2: Do high school athletic coaches of certain demographic categories wish to implement drug testing on high school athletes?	Demographic information Should high school athletes be tested for performance enhancing drugs?	Summary of descriptive statistics Chi-square
Q3: Are there differences among high school athletic coaches' views, based on demographic categories, on punishments for a student athlete's positive performance enhancing drug test?	Demographic information Assuming performance enhancing drug testing was implemented, what level of punishment should be associated with positive tests	Summary of descriptive statistics ANOVA

Figure 7. Pairing of research questions from electronic survey to SPSS analysis type by researcher Greco (2014).

Validity

Validity of the instrument in this study is the "extent to which the instrument measures what it is intended to" (Leedy & Ormrod, 2010, p. 28). The electronic survey was a tool used by the researcher to gather demographic information on a nominal scale for gender and political affiliation as well as interval scales for age and years in teaching. The electronic survey was designed to assist the researcher in measuring possible differences between demographic categories and opinions regarding the classification, testing, and punishment associated with performance enhancing drug use by high school athletes. The electronic survey is limited by the amount of responses subjects are allowed on most questions. Specifically, the ordinal Likert scale choices regarding opinions on implementation of PED testing and levels of punishment associated with positive PED tests may cause some participants to choose an answer that may not most accurately represent their beliefs, thus affecting the validity of the electronic survey.

Content validity is "when the instrument used is designed to accurately measure the concepts under study" (Heavey, 2011, p.48). To increase the content validity of the electronic survey, the researcher provided the electronic survey to ten coaches in high school athletics. These coaches reviewed the electronic survey for clarity, accuracy, and flow. Finally, research data was maintained in a secure location at the institution. Only authorized individuals had access to it. Research data was stored electronically on a secure computer in an encrypted file with password protection. All data gathered from the study will be stored for a minimum of seven years after publication of the study as recommended by Shamoo and Resnik (2009). Data storage "is crucial to ensuring accountability in research and to keeping a proper paper trail for management and for other future interested parties to authenticate the data" (Shamoo & Resnik,

2009, p. 44). The inclusion of recommendations from an expert in the content field combined with data storage measures added to the validity of the proposed study.

Reliability

Reliability of this study is the "consistency with which a measuring instrument yields a certain result when the entity being measured has not changed" (Leedy & Ormrod, 2010, p. 29). Specifically, internal consistency reliability is "the extent to which all of the items within a single instrument yield similar results" (Leedy & Ormrod, 2010, p.93). The electronic survey is limited by the participants' responses at any given moment. Overall mood or attitude on specific subjects may differ at any time and may affect the results. The limited number of questions included on the survey, specifically questions that test for similar responses in different ways, could inhibit the determination of consistency of responses given by each participant. Based on personal experience, the researcher deliberately constructed a brief survey to increase the likelihood of a higher response rate from the sample population.

The researcher replicated the delivery, instruction, and procedures associated with the study for each respondent. Once IRB approval was obtained, all subjects received an invitation to participate in the study via email. Subjects who opted to participate in the study gave consent by clicking on a link provided in the invitation email. By clicking on the link, participants were forwarded to the electronic survey where they were able to submit their responses electronically. Instructions for completion of the electronic survey was included as well as contact information for the researcher. A follow up email was sent to the entire list of possible participants thanking them for their time and for their possible participation time. The follow up email was sent to the list in its entirety as the researcher did not have access to who had completed the surveys due to the anonymity of the participants. The reason the survey was conducted electronically is based

on Creswell (2013). He states that providing surveys via electronic email reduces costs for travel and data transcription and allows participants have more time to respond while being nonthreatening and comfortable (Creswell, 2013).

Limitations

Limitations of the study include the sampling method, sample size, tool selection and administration, and external variables. The purposeful sampling method limits the overall exposure of the study to high school athletic coaches in Midwestern school districts. Assuming that the small sample size of high school athletic coaches who participated in this study represents high school athletic coaches in general leaves the possibility for bias. Selecting an electronic survey as the main tool of the experiment also creates elements of bias. Questions can unintentionally be worded to lead participants to a response. Furthermore, participants are limited in their responses by only having a set amount of responses on most questions. Selecting specific independent variables of interest to the researcher, while excluding others, assumes differences between variables. The differences in variables may lead to a type I error in the statistical analysis of the results.

Ethical Considerations

Before beginning this study, the researcher sought an expedited Institutional Review Board (IRB) approval. Due to the anonymity and nature of the electronic survey, the risk to each participant is no greater than one would encounter on a daily basis. Once IRB approval was established, the researcher recruited eligible participants by sending an electronic email to the account they provided to the regional coaches' association (Appendix B). The email outlined the purpose of the study and expectations of participants. Those who opted to participate electronically completed the online survey provided by the researcher. Instructions on how to

access and complete the electronic survey was included in the recruitment email. The instructions also included a link to complete the electronic survey if they choose to participate. Each participant was notified that their involvement was completely voluntary and no compensation would be given for their time.

Each participant was provided an electronic copy of The Rights of Research Participants as required by the institution's IRB. This copy was included in the recruitment email to each participant. Each participant was informed in the email of the anonymity of their responses. Data collection tools had no identifying measures that could be traced back to the participant, and no one other than the researcher knew who was invited to participate in the study. Any hard copy data printed from the survey results was securely stored in a locked cabinet. Data was electronically backed up and stored on a password encrypted flash drive. All data will be maintained for a minimum of seven years after publication of the study.

Summary

The study determines if differences existed between high school athletic coaches' opinions about performance enhancing drug use. Specifically, the study focuses on whether demographic categories to which coaches belong make a difference in their opinions about classification, testing, and punishment for student athletes associated with performance enhancing drug use. To reach a determination, a quantitative research study was conducted to determine differences between variables. These differences were measured using results of an electronic survey. Additionally, quantitative methodology was combined with statistical analysis to see if differences existed between variables. Results of the study may indicate differences in coaches' opinions, depending on demographic information such as the sport they coach or how many years they have coached. This information may eventually be used to recommend

professional development for coaches, further education about PED use to students, and possibly policy change in the area of high school athletics.

CHAPTER IV: RESULTS

Introduction

Information from multiple studies regarding drug testing effectiveness is contradictory and appears to depend on PED prevalence and types of drugs tested. Having a local agreement on PED testing may lead to a national standard of testing for all high school athletes similar to requiring student athletes to have a physical and parental permission to participate. The equality of nationwide testing standards would create an even playing field for athletes trying to legitimately gain college scholarships for athletics. While it may not be multimillion dollar contracts and instant fame, legitimizing high school athletics may ultimately have a trickle up effect for our superstar professional athletes of today.

The purpose of this study determined whether or not differences existed between high school athletic coaches of certain demographic categories and their opinions regarding the classification, testing, and punishment associated with performance enhancing drug use by high school athletes. The coaches were all members of a regional coaches' association who provided their electronic email to the organization. As mentioned in Chapter 1, drug testing minors in athletics is riddled with red tape and politics. The researchers utilized a survey of coaches to find a starting common ground regarding the establishment of PED testing in states where no such rule exists. Specifically the researcher sought to gain information that is not currently in the literature about PED testing to inform future policy for high schools. Furthermore, the researcher's future plan to be involved in high school administration was part of the objective of conducting this particular study.

This study was done as a single phase, electronic survey employing quantitative methodology. The electronic survey contained a series of questions related to demographic information of high school athletic coaches, in addition to their opinions regarding the

classification, testing, and punishment associated with performance enhancing drug use by high school athletes. This chapter begins with an overview of the analysis of the quantitative data collected from the 664 coaches who participated in this study. The overview of the analysis will include the procedures within the analysis and a description of the demographic characteristics of those coaches participating in the survey.

The research examined the results of the coaches' responses to each of the following research questions:

Q1: What do high school athletic coaches of certain demographic categories consider a PED?

Q2: Do high school athletic coaches of certain demographic categories wish to implement drug testing on high school athletes?

Q3: Are there differences among high school athletic coaches' views, based on demographic categories, on punishments for a student athlete's positive performance enhancing drug test?

Response Rate to the Survey

One regional coaches association agreed to assist the study by providing an electronic list of 3565 member emails. From this list, 664 coaches participated in the electronic survey, for a response rate of 18.6%. The response rate exceeded the sample size goal of 30 to 500 participants or 10% of the parent population per Sue & Ritter (2013). Since an appropriate number of participants were obtained, the researcher did not need to select another regional coaching association to survey.

Data Analysis Procedures

The researcher utilized data collected from an electronic survey that was sent to coaches who had provided their electronic email to the regional coaches association. The instrument was Internet based, and each coach was given a link to access the survey to keep all information confidential. The instrument measured coaches' opinions of performance enhancing drugs in high school athletics under three main research components: classification of a PED, implementation of drug testing, and punishments for positive drug tests.

The electronic survey (see Appendix A) contained a series of questions related to demographic information of high school athletic coaches, in addition to their opinions regarding the classification, testing, and punishment associated with performance enhancing drug use by high school athletes. The total population of this study was composed of 3565 coaches who were members of the regional coaches association.

A letter of solicitation was sent to the 3565 coaches via electronic email provided by the regional coaches' association. The letter contained instructions on how to access and complete the electronic survey, a link to complete the electronic survey, and an electronic copy of The Rights of Research Participants as required by the institution's IRB. Within the email, each participant was notified that their involvement is completely voluntary and no compensation was given for their time. In addition, they were informed of the anonymity of their responses.

Data was collected from the 664 coaches and then analyzed using the Statistical Package for Social Sciences (SPSS) Version 21. The research questions were analyzed using a summary of descriptive statistics, Chi-square test, and ANOVA. The research question and data analysis pairing was previously shown in Figure 7 (see below).

Figure 7. Research Question/Data Analysis Pairing

Research Question	Survey Question(s)	Data Analysis
Q1: What do high school athletic coaches of certain demographic categories consider a PED?	Demographic information Which of the following would you consider a performance enhancing drug?	Summary of descriptive statistics Chi-square
Q2: Do high school athletic coaches of certain demographic categories wish to implement drug testing on high school athletes?	Demographic information Should high school athletes be tested for performance enhancing drugs?	Summary of descriptive statistics Chi-square
Q3: Are there differences among high school athletic coaches' views, based on demographic categories, on punishments for a student athlete's positive performance enhancing drug test?	Demographic information Assuming performance enhancing drug testing was implemented, what level of punishment should be associated with positive tests	Summary of descriptive statistics ANOVA

Figure 7. Pairing of research questions from electronic survey to SPSS analysis type by researcher Greco (2014).

During analysis, the independent variables for the sample of high school athletic coaches were gender, years in high school coaching, paid versus volunteer status (coaching designation), grade level(s) coached, and sport(s) coached. Dependent variables for the sample of high school athletic coaches were personal classification of performance enhancing drugs (PEDs), level of desire to implement testing of PEDs, and opinion on punishment levels associated with assumed PED testing.

Demographic information obtained from the electronic survey was quantitatively analyzed using descriptive statistics. A summary of descriptive statistics was used to determine if differences existed between independent variable groups. Chi-square analysis was performed with "independent samples of nominal or ordinal-level data," (Heavey, 2011, p.106). Chi-square analysis was used because demographic information related to gender, paid versus volunteer status, and sport(s) coached was collected on a nominal scale. An ANOVA was performed for each of the dependent variables to determine differences between the independent variable groups and to reduce the risk of a type I error which multiple t-tests could result (Heavey, 2011). Statistical significance was determined by setting the alpha level at .05, the power at .80, and utilizing a one tailed test. An alpha level of .05 was used because "the agreed upon probability of .05 represents the type I error rate that researchers are willing to accept before we conduct our statistical analysis," (Urdan, 2010, p.66). A power level of .80 was used as "most studies typically consider 80% power as adequate," (Heavey, 2011, p.90).

Demographic Data

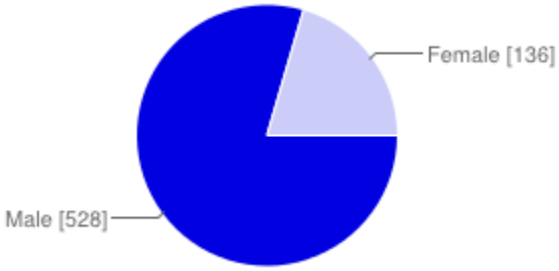
The electronic survey contained questions designed to list demographic data related to the coaches who participated in the study. The questions included the independent variables of gender, years in high school coaching, paid versus volunteer status, grade level(s) coached, and sport(s) coached.

The survey asked participants to identify their gender by selecting "male" or "female" from a dropdown box. Five hundred and twenty eight males represented 79.5% of the sample population. One hundred and thirty six females represented 20.5% of the sample population (see Table 1).

Table 1
Participant Gender

Gender	Frequency	Percent
Male	528	79.5
Female	136	20.5

N=664



The survey asked participants to identify how many years they had been coaching at the high school level by inputting a whole number into a text box. Values ranged from a minimum of "1" year to a maximum of "52" years with a standard deviation of 11.12 years. The mean value for years of coaching was 16.63 years (see Table 2).

Table 2
Years in High School Coaching

Range	Standard Deviation	Mean
Min=1; Max= 52	11.12 years	16.63 years

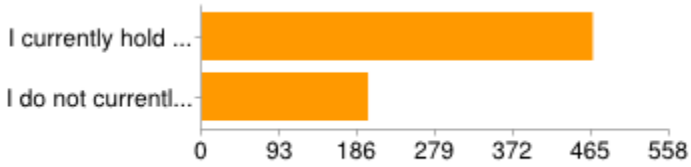
N=664

The survey asked participants to identify their coaching certification type by selecting "yes" if they currently held a state coaching endorsement or "no" if they did not currently hold a state coaching endorsement. Four hundred and sixty six respondents, representing 70.2% of the sample population, held a state coaching endorsement. One hundred and ninety eight respondents, representing 29.8% of the sample population, did not hold a state coaching endorsement (see Table 3).

Table 3
Coaching Certification

Certification	Frequency	Percent
Yes	466	70.2
No	198	29.8

N=664

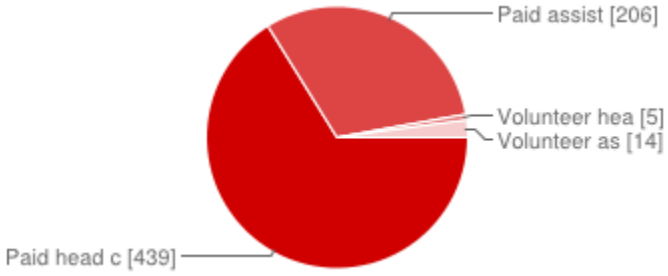


The survey asked participants to identify their status as a coach. From a dropdown box, participants were able to select one of four choices: paid head coach, paid assistant coach, volunteer head coach, and volunteer assistant coach. More than 90% of coaches who participated in the survey were paid, while less than 3% were volunteer coaches (see Table 4).

Table 4
Paid versus Volunteer Status

Coaching Status	Frequency	Percent
Paid Head Coach	439	66.1
Paid Assistant Coach	206	31.0
Volunteer Head Coach	5	0.8
Volunteer Assistant Coach	14	2.1

N=664

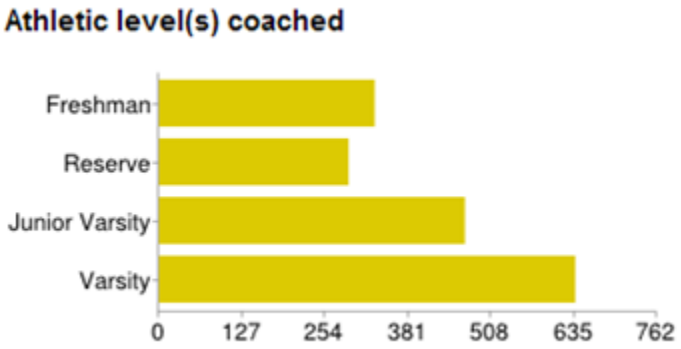


The survey asked participants to identify the grade level(s) they coached at the high school level. Some participants coached multiple levels during different seasons. From a list of multiple responses, participants were able to select: freshman, reserve, junior varsity, and/or varsity. Nearly all of the participants had some involvement at the varsity level, while less than half coached at the reserve level (see Table 5).

Table 5
Athletic Level Coached

Athletic Level Coached	Frequency	Percent
Freshman	330	49.7
Reserve	290	43.7
Junior Varsity	468	70.5
Varsity	637	95.9

N=664



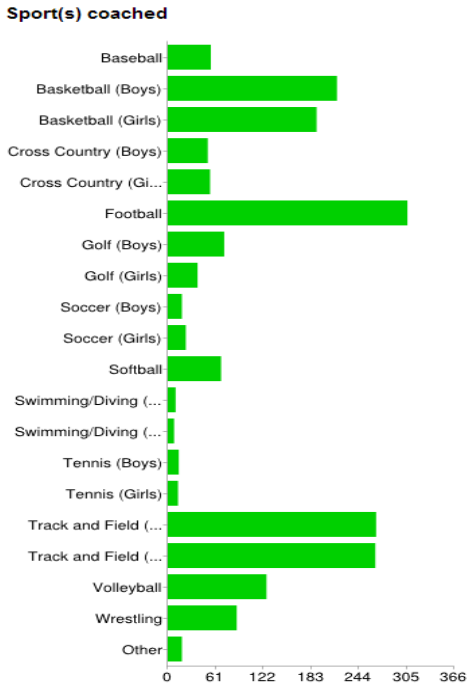
The survey asked participants to identify the type of sport they coached at the high school level. Some participants coached multiple sports during different seasons. From a list of multiple responses selected form an athletic association in which the regional coaches association is a part of, participants were able to select: Baseball, Basketball (Boys), Basketball (Girls), Cross Country (Boys), Cross Country (Girls), Football, Golf (Boys), Golf (Girls), Soccer (Boys), Soccer (Girls), Softball, Swimming/Diving (Boys), Swimming/Diving (Girls), Tennis

(Boys), Tennis (Girls), Track and Field (Boys), Track and Field (Girls), Volleyball, Wrestling, Other. Football, track (boys and girls), and basketball (boys and girls), were the most commonly selected sports while Swimming/Diving (boys and girls), soccer (boys and girls), and tennis (boys and girls) were the least selected sports (see table 6).

Table 6
Sport(s) coached

Sport	Frequency	Percent
Baseball	55	8%
Basketball (Boys)	216	33%
Basketball (Girls)	190	29%
Cross Country (Boys)	51	8%
Cross Country (Girls)	54	8%
Football	306	46%
Golf (Boys)	72	11%
Golf (Girls)	38	6%
Soccer (Boys)	18	3%
Soccer (Girls)	23	3%
Softball	68	10%
Swimming/Diving (Boys)	10	2%
Swimming/Diving (Girls)	8	1%
Tennis (Boys)	14	2%
Tennis (Girls)	13	2%
Track and Field (Boys)	266	40%
Track and Field (Girls)	265	40%
Volleyball	126	19%
Wrestling	88	13%
Other	18	3%

N=664



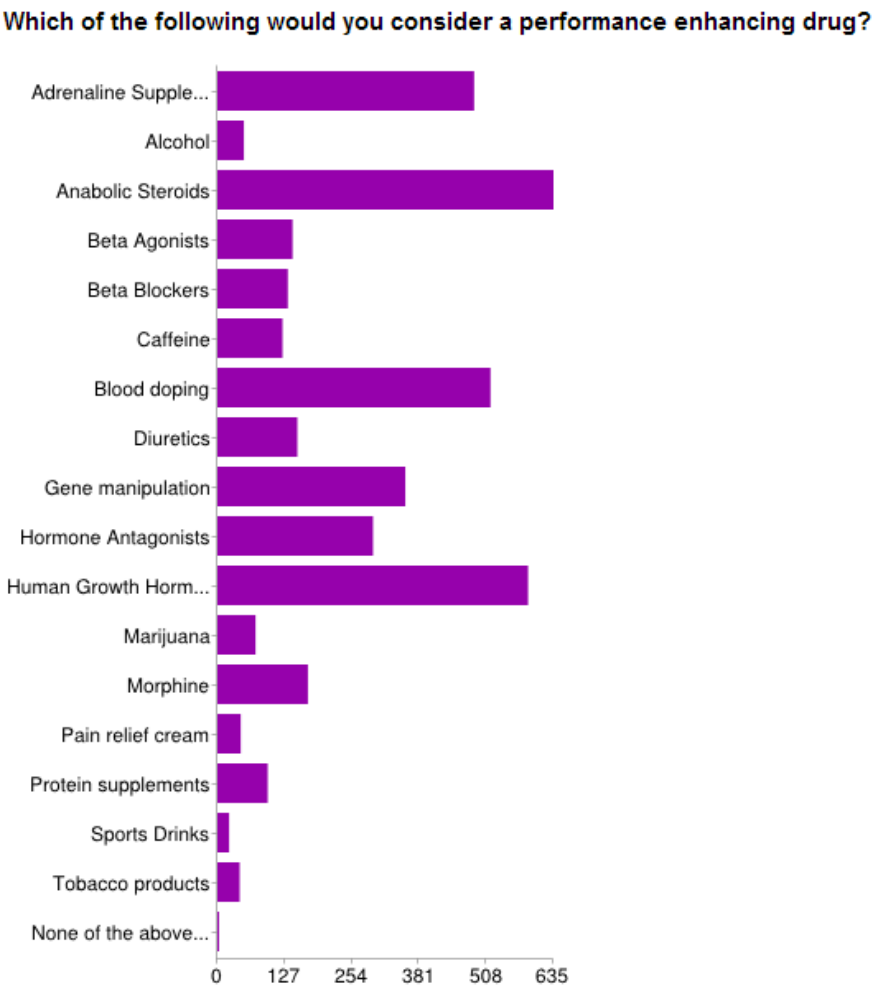
Research Question #1

The first research question asked coaches to identify what they consider a performance enhancing drug (PED). From a list of multiple responses selected from a combination of PEDs listed on the World Anti Doping Agency (WADA) banned list and the researcher's personal observations, participants were able to select: Adrenaline Supplement, Alcohol, Anabolic Steroids, Beta Agonists, Beta Blockers, Blood doping, Caffeine, Diuretics, Gene manipulation, Hormone Antagonists, Human Growth Hormone (HGH), Marijuana, Morphine, Pain relief cream, Protein supplements, Sports Drinks, Tobacco products, and/or None of the above are Performance enhancers. Regardless of demographic variables, overall responses for each selection are listed in Table 7.

Table 7
Research Question #1 Non-demographic Response Rate

Performance Enhancing Drug	Frequency	Percentage
Adrenaline Supplement	485	73.0
Alcohol	50	7.53
Anabolic Steroids	635	95.6
Beta Blockers	142	21.4
Beta Agonists	133	20.0
Blood Doping	516	77.7
Caffeine	123	18.5
Diuretics	151	22.7
Gene Manipulation	355	53.5
Hormone Antagonists	294	44.3
Human Growth Hormone	587	88.4
Marijuana	72	10.8
Morphine	171	25.7
Pain Relief Cream	44	6.62
Protein Supplement	95	14.3
Sports Drinks	22	3.31
Tobacco Products	42	6.32
None of the Above	3	0.45

N=664



To examine the demographic variables of research question #1, a Chi-square test was performed on each of the independent variables to determine if differences existed between high school athletic coaches of certain demographic categories and their opinions regarding the classification of performance enhancing drugs. Results of the statistically significant analyses are listed below and have corresponding tables.

Gender

There was a statistically significant association, $X^2(1, N = 664) = 5.01$, $p = .03$, between Gender and classifying Blood Doping as a PED (see Table 8)

Table 8
Chi-square test: Gender and Blood Doping

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	5.009[a]	1	.025		
Continuity Correction[b]	4.506	1	.034		
Likelihood Ratio	4.773	1	.029		
Fisher's Exact Test				.028	.019
Linear-by-Linear Association	5.002	1	.025		
N of Valid Cases	664				

N=664

There was a statistically significant association, $X^2(1, N = 664) = 6.00$, $p = .01$, between Gender and classifying Gene Manipulation as a PED (see Table 9).

Table 9
Chi-square test: Gender and Gene Manipulation

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	6.005[a]	1	.014		
Continuity Correction[b]	5.542	1	.019		
Likelihood Ratio	5.995	1	.014		
Fisher's Exact Test				.016	.009
Linear-by-Linear Association	5.996	1	.014		
N of Valid Cases	664				

N=664

There was a statistically significant association, $X^2(1, N = 664) = 62.10$, $p = .000$, between Gender and classifying Human Growth Hormone (HGH) as a PED (see Table 10).

Table 10
Chi-square test: Gender and Human Growth Hormone (HGH)

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	62.053[a]	1	.000		
Continuity Correction[b]	59.710	1	.000		

Likelihood Ratio	50.766	1	.000		
Fisher's Exact Test				.000	.000
Linear-by-Linear Association	61.960	1	.000		
N of Valid Cases	664				

N=664

There was a statistically significant association, $X^2(1, N = 664) = 3.75$, $p = .05$, between Gender and classifying Pain Relief Cream as a PED (see Table 11).

Table 11
Chi-square test: Gender and Pain Relief Cream

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	3.754[a]	1	.053		
Continuity Correction[b]	3.043	1	.081		
Likelihood Ratio	4.458	1	.035		
Fisher's Exact Test				.054	.033
Linear-by-Linear Association	3.749	1	.053		
N of Valid Cases	664				

N=664

Years in Coaching

There was a marginally statistically significant association, $X^2(45, N = 664) = 60.70$, $p = .06$, between Years in Coaching and classifying Alcohol as a PED (see Table 12).

Table 12
Chi-square test: Years in Coaching and Alcohol

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	60.682[a]	45	.059
Likelihood Ratio	59.235	45	.076
Linear-by-Linear Association	.028	1	.868
N of Valid Cases	664		

N=664

Coaching Certification

There was a statistically significant association, $X^2(1, N = 664) = 8.20$, $p = .004$, between Coaching Certification and classifying Alcohol as a PED (see Table 13).

Table 13
Chi-square test: Coaching Certification and Alcohol

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	8.204[a]	1	.004		
Continuity Correction[b]	7.309	1	.007		
Likelihood Ratio	9.600	1	.002		
Fisher's Exact Test				.003	.002
Linear-by-Linear Association	8.192	1	.004		
N of Valid Cases	664				

N=664

There was a statistically significant association, $X^2(1, N = 664) = 6.88$, $p = .01$, between Coaching Certification and classifying Blood Doping as a PED (see Table 14).

Table 14
Chi-square test: Coaching Certification and Blood Doping

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	6.879[a]	1	.009		
Continuity Correction[b]	6.355	1	.012		
Likelihood Ratio	6.656	1	.010		
Fisher's Exact Test				.011	.006
Linear-by-Linear Association	6.869	1	.009		
N of Valid Cases	664				

N=664

There was a statistically significant association, $X^2(1, N = 664) = 7.07$, $p = .01$, between Coaching Certification and classifying Human Growth Hormone (HGH) as a PED (see Table 15).

Table 15
Chi-square test: Coaching Certification and Human Growth Hormone (HGH)

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	7.075[a]	1	.008		
Continuity Correction[b]	6.388	1	.011		

Likelihood Ratio	6.683	1	.010		
Fisher's Exact Test				.011	.007
Linear-by-Linear Association	7.064	1	.008		
N of Valid Cases	664				

N=664

There was a statistically significant association, $X^2(1, N = 664) = 6.68$, $p = .01$, between Coaching Certification and classifying Marijuana as a PED (see Table 16).

Table 16

Chi-square test: Coaching Certification and Marijuana

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	6.676[a]	1	.010		
Continuity Correction[b]	5.989	1	.014		
Likelihood Ratio	7.368	1	.007		
Fisher's Exact Test				.009	.005
Linear-by-Linear Association	6.666	1	.010		
N of Valid Cases	664				

N=664

There was a statistically significant association, $X^2(1, N = 664) = 3.71$, $p = .05$, between Coaching Certification and classifying Tobacco Products as a PED (see Table 17).

Table 17

Chi-square test: Coaching Certification and Tobacco Products

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	3.706[a]	1	.054		
Continuity Correction[b]	3.066	1	.080		
Likelihood Ratio	4.113	1	.043		
Fisher's Exact Test				.056	.035
Linear-by-Linear Association	3.701	1	.054		
N of Valid Cases	664				

N=664

Paid versus Volunteer Status

There was not a statistically significant association between Paid versus Volunteer Status and classifying PEDs.

Athletic Level Coached

Freshman

There was a statistically significant association, $X^2(1, N = 664) = 5.87$, $p = .02$, between Athletic Level Coached (Freshman) and classifying Gene Manipulation as a PED (see Table 18).

Table 18
Chi-square test: Athletic Level Coached (Freshman) and Gene Manipulation

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	5.869[a]	1	.015		
Continuity Correction[b]	5.498	1	.019		
Likelihood Ratio	5.879	1	.015		
Fisher's Exact Test				.016	.009
Linear-by-Linear Association	5.861	1	.015		
N of Valid Cases	664				

N=664

Reserve

There was a statistically significant association, $X^2(1, N = 664) = 5.06$, $p = .02$, between Athletic Level Coached (Reserve) and classifying Diuretics as a PED (see Table 19).

Table 19
Chi-square test: Athletic Level Coached (Reserve) and Diuretics

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	5.061[a]	1	.024		
Continuity Correction[b]	4.649	1	.031		
Likelihood Ratio	5.030	1	.025		
Fisher's Exact Test				.025	.016
Linear-by-Linear Association	5.053	1	.025		
N of Valid Cases	664				

N=664

There was a statistically significant association, $X^2(1, N = 664) = 6.26$, $p = .01$, between Athletic Level Coached (Reserve) and classifying Gene Manipulation as a PED (see Table 20).

Table 20

Chi-square test: Athletic Level Coached (Reserve) and Gene Manipulation

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	6.264[a]	1	.012		
Continuity Correction[b]	5.877	1	.015		
Likelihood Ratio	6.282	1	.012		
Fisher's Exact Test				.015	.008
Linear-by-Linear Association	6.254	1	.012		
N of Valid Cases	664				

N=664

There was a statistically significant association, $X^2(1, N = 664) = 4.86$, $p = .03$, between Athletic Level Coached (Reserve) and classifying Morphine as a PED (see Table 21).

Table 21

Chi-square test: Athletic Level Coached (Reserve) and Morphine

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	4.857[a]	1	.028		
Continuity Correction[b]	4.470	1	.034		
Likelihood Ratio	4.831	1	.028		
Fisher's Exact Test				.032	.017
Linear-by-Linear Association	4.849	1	.028		
N of Valid Cases	664				

N=664

There was a statistically significant association, $X^2(1, N = 664) = 4.58$, $p = .03$, between Athletic Level Coached (Reserve) and classifying Tobacco Products as a PED (see Table 22).

Table 22

Chi-square test: Athletic Level Coached (Reserve) and Tobacco Products

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)

Pearson Chi-Square	4.578[a]	1	.032		
Continuity Correction[b]	3.916	1	.048		
Likelihood Ratio	4.536	1	.033		
Fisher's Exact Test				.037	.024
Linear-by-Linear Association	4.571	1	.033		
N of Valid Cases	664				

N=664

Junior Varsity

There was a statistically significant association, $X^2(1, N = 664) = 5.36$, $p = .02$, between Athletic Level Coached (Junior Varsity) and classifying Anabolic Steroids as a PED (see Table 23).

Table 23
Chi-square test: Athletic Level Coached (Junior Varsity) and Anabolic Steroids

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	5.358[a]	1	.021		
Continuity Correction[b]	4.438	1	.035		
Likelihood Ratio	6.454	1	.011		
Fisher's Exact Test				.021	.012
Linear-by-Linear Association	5.350	1	.021		
N of Valid Cases	664				

N=664

There was a statistically significant association, $X^2(1, N = 664) = 4.61$, $p = .03$, between Athletic Level Coached (Junior Varsity) and classifying Diuretics as a PED (see Table 24).

Table 24
Chi-square test: Athletic Level Coached (Junior Varsity) and Diuretics

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	4.605[a]	1	.032		
Continuity Correction[b]	4.180	1	.041		
Likelihood Ratio	4.784	1	.029		
Fisher's Exact Test				.033	.019
Linear-by-Linear Association	4.598	1	.032		

N of Valid Cases	664				

N=664

Varsity

There was a marginal statistical significant association, $X^2(1, N = 664) = 3.06$, $p = .08$, between Athletic Level Coached (Varsity) and classifying Anabolic Steroids as a PED (see Table 25).

Table 25
Chi-square test: Athletic Level Coached (Junior Varsity) and Anabolic Steroids

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	3.064[a]	1	.080		
Continuity Correction[b]	1.612	1	.204		
Likelihood Ratio	2.220	1	.136		
Fisher's Exact Test				.108	.108
Linear-by-Linear Association	3.060	1	.080		
N of Valid Cases	664				

N=664

Sports Coached

There was a statistically significant association, $X^2(1, N = 664) = 3.71$, $p = .05$, between Sport Coached (Baseball) and classifying Human Growth Hormone (HGH) as a PED (see Table 26).

Table 26
Chi-square test: Sport Coached (Baseball) and Human Growth Hormone (HGH)

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	3.706[a]	1	.054		
Continuity Correction[b]	2.908	1	.088		
Likelihood Ratio	4.802	1	.028		
Fisher's Exact Test				.074	.033
Linear-by-Linear Association	3.701	1	.054		
N of Valid Cases	664				

N=664

There was a statistically significant association, $X^2(1, N = 664) = 5.48$, $p = .02$, between Sport Coached (Basketball (Boys)) and classifying Human Growth Hormone (HGH) as a PED (see Table 27).

Table 27
Chi-square test: Sport Coached (Basketball (Boys)) and Human Growth Hormone (HGH)

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)
Pearson Chi-Square	5.480[a]	1	.019	
Continuity Correction[b]	4.891	1	.027	
Likelihood Ratio	5.876	1	.015	
Fisher's Exact Test				.020
Linear-by-Linear Association	5.472	1	.019	
N of Valid Cases	664			

N=664

There was a statistically significant association, $X^2(1, N = 664) = 5.80$, $p = .02$, between Sport Coached (Basketball (Girls)) and classifying Protein Supplements as a PED (see Table 28).

Table 28
Chi-square test: Sport Coached (Basketball (Girls)) and Protein Supplements

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)
Pearson Chi-Square	5.795[a]	1	.016	
Continuity Correction[b]	5.219	1	.022	
Likelihood Ratio	5.516	1	.019	
Fisher's Exact Test				.020
Linear-by-Linear Association	5.786	1	.016	
N of Valid Cases	664			

N=664

There was a statistically significant association, $X^2(1, N = 664) = 4.82$, $p = .03$, between Sport Coached (Football) and classifying Adrenaline Supplements as a PED (see Table 29).

Table 29
Chi-square test: Sport Coached (Football) and Adrenaline Supplements

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)
Pearson Chi-Square	4.817[a]	1	.028	
Continuity Correction[b]	4.439	1	.035	
Likelihood Ratio	4.807	1	.028	
Fisher's Exact Test				.035
Linear-by-Linear Association	4.809	1	.028	
N of Valid Cases	664			

N=664

There was a statistically significant association, $X^2(1, N = 664) = 14.18$, $p = .000$, between Sport Coached (Football) and classifying Human Growth Hormone (HGH) as a PED (see Table 30).

Table 30
Chi-square test: Sport Coached (Football) and Human Growth Hormone (HGH)

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)
Pearson Chi-Square	14.177[a]	1	.000	
Continuity Correction[b]	13.276	1	.000	
Likelihood Ratio	14.843	1	.000	
Fisher's Exact Test				.000
Linear-by-Linear Association	14.156	1	.000	
N of Valid Cases	664			

N=664

There was a statistically significant association, $X^2(1, N = 664) = 5.84$, $p = .02$, between Sport Coached (Football) and classifying Pain Relief Cream as a PED (see Table 31).

Table 31
Chi-square test: Sport Coached (Football) and Pain Relief Cream

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)
Pearson Chi-Square	5.843[a]	1	.016	
Continuity Correction[b]	5.111	1	.024	
Likelihood Ratio	5.856	1	.016	
Fisher's Exact Test				.019
Linear-by-Linear Association	5.834	1	.016	
N of Valid Cases	664			

N=664

There was a statistically significant association, $X^2(1, N = 664) = 5.84$, $p = .02$, between Sport Coached (Football) and classifying Pain Relief Cream as a PED (see Table 32).

Table 32
Chi-square test: Sport Coached (Football) and Pain Relief Cream

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)
Pearson Chi-Square	5.843[a]	1	.016	
Continuity Correction[b]	5.111	1	.024	
Likelihood Ratio	5.856	1	.016	
Fisher's Exact Test				.019
Linear-by-Linear Association	5.834	1	.016	
N of Valid Cases	664			

N=664

There was a statistically significant association, $X^2(1, N = 664) = 5.59$, $p = .02$, between Sport Coached (Golf (Boys)) and classifying Beta Blockers as a PED (see Table 33).

Table 33
Chi-square test: Sport Coached (Golf (Boys)) and Beta Blockers

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)
Pearson Chi-Square	5.585[a]	1	.018	
Continuity Correction[b]	4.873	1	.027	
Likelihood Ratio	5.085	1	.024	
Fisher's Exact Test				.028
Linear-by-Linear Association	5.577	1	.018	
N of Valid Cases	664			

N=664

There was a statistically significant association, $X^2(1, N = 664) = 5.27$, $p = .02$, between Sport Coached (Golf (Girls)) and classifying Hormone Antagonists as a PED (see Table 34).

Table 34
Chi-square test: Sport Coached (Golf (Girls)) and Hormone Antagonists

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)
Pearson Chi-Square	5.270[a]	1	.022	
Continuity Correction[b]	4.526	1	.033	
Likelihood Ratio	5.541	1	.019	
Fisher's Exact Test				.028
Linear-by-Linear Association	5.262	1	.022	
N of Valid Cases	664			

N=664

There was a statistically significant association, $X^2(1, N = 664) = 8.25$, $p = .004$, between Sport Coached (Soccer (Girls)) and classifying Human Growth Hormone (HGH) as a PED (see Table 35).

Table 35
Chi-square test: Sport Coached (Soccer (Girls)) and Human Growth Hormone (HGH)

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	8.248[a]	1	.004		
Continuity Correction[b]	6.454	1	.011		
Likelihood Ratio	6.130	1	.013		
Fisher's Exact Test				.011	.011
Linear-by-Linear Association	8.235	1	.004		
N of Valid Cases	664				

N=664

There was a statistically significant association, $X^2(1, N = 664) = 8.13$, $p = .004$, between Sport Coached (Softball) and classifying Alcohol as a PED (see Table 36).

Table 36
Chi-square test: Sport Coached (Softball) and Alcohol

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	8.134[a]	1	.004		
Continuity Correction[b]	6.809	1	.009		
Likelihood Ratio	6.500	1	.011		
Fisher's Exact Test				.012	.008
Linear-by-Linear Association	8.122	1	.004		
N of Valid Cases	664				

N=664

There was a statistically significant association, $X^2(1, N = 664) = 9.86$, $p = .002$, between Sport Coached (Softball) and classifying Marijuana as a PED (see Table 37).

Table 37
Chi-square test: Sport Coached (Softball) and Marijuana

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	9.857[a]	1	.002		
Continuity Correction[b]	8.607	1	.003		
Likelihood Ratio	8.101	1	.004		
Fisher's Exact Test				.004	.003
Linear-by-Linear Association	9.842	1	.002		
N of Valid Cases	664				

N=664

There was a statistically significant association, $X^2(1, N = 664) = 3.78$, $p = .05$, between Sport Coached (Softball) and classifying Tobacco Products as a PED (see Table 38).

Table 38
Chi-square test: Sport Coached (Softball) and Tobacco Products

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	3.783[a]	1	.052		
Continuity Correction[b]	2.829	1	.093		
Likelihood Ratio	3.150	1	.076		
Fisher's Exact Test				.064	.054
Linear-by-Linear Association	3.777	1	.052		
N of Valid Cases	664				

N=664

There was a statistically significant association, $X^2(1, N = 664) = 4.76$, $p = .03$, between Sport Coached (Tennis (Girls)) and classifying Human Growth Hormone (HGH) as a PED (see Table 39).

Table 39
Chi-square test: Sport Coached (Tennis (Girls)) and Human Growth Hormone (HGH)

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	4.755[a]	1	.029		
Continuity Correction[b]	3.038	1	.081		

Likelihood Ratio	3.500	1	.061		
Fisher's Exact Test				.053	.053
Linear-by-Linear Association	4.747	1	.029		
N of Valid Cases	664				

N=664

There was a statistically significant association, $X^2(1, N = 664) = 5.71$, $p = .02$, between Sport Coached (Track and Field (Boys)) and classifying Caffeine as a PED (see Table 40).

Table 40
Chi-square test: Sport Coached (Track and Field (Boys)) and Caffeine

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	5.714[a]	1	.017		
Continuity Correction[b]	5.237	1	.022		
Likelihood Ratio	5.630	1	.018		
Fisher's Exact Test				.019	.011
Linear-by-Linear Association	5.705	1	.017		
N of Valid Cases	664				

N=664

There was a statistically significant association, $X^2(1, N = 664) = 4.09$, $p = .04$, between Sport Coached (Track and Field (Boys)) and classifying Protein Supplements as a PED (see Table 41).

Table 41
Chi-square test: Sport Coached (Track and Field (Boys)) and Protein Supplements

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	4.091[a]	1	.043		
Continuity Correction[b]	3.646	1	.056		
Likelihood Ratio	4.026	1	.045		
Fisher's Exact Test				.054	.029
Linear-by-Linear Association	4.085	1	.043		
N of Valid Cases	664				

N=664

There was a statistically significant association, $X^2(1, N = 664) = 7.07$, $p = .01$, between Sport Coached (Track and Field (Boys)) and classifying Tobacco Products as a PED (see Table 42).

Table 42
Chi-square test: Sport Coached (Track and Field (Boys)) and Tobacco Products

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	7.074[a]	1	.008		
Continuity Correction[b]	6.235	1	.013		
Likelihood Ratio	6.899	1	.009		
Fisher's Exact Test				.009	.007
Linear-by-Linear Association	7.063	1	.008		
N of Valid Cases	664				

N=664

There was a statistically significant association, $X^2(1, N = 664) = 4.09$, $p = .04$, between Sport Coached (Track and Field (Girls)) and classifying Caffeine as a PED (see Table 43).

Table 43
Chi-square test: Sport Coached (Track and Field (Girls)) and Caffeine

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	4.087[a]	1	.043		
Continuity Correction[b]	3.685	1	.055		
Likelihood Ratio	4.033	1	.045		
Fisher's Exact Test				.052	.028
Linear-by-Linear Association	4.081	1	.043		
N of Valid Cases	664				

N=664

There was a statistically significant association, $X^2(1, N = 664) = 5.55$, $p = .02$, between Sport Coached (Track and Field (Girls)) and classifying Tobacco Products as a PED (see Table 44).

Table 44
Chi-square test: Sport Coached (Track and Field (Girls)) and Tobacco Products

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	5.552[a]	1	.018		
Continuity Correction[b]	4.812	1	.028		
Likelihood Ratio	5.414	1	.020		
Fisher's Exact Test				.022	.015
Linear-by-Linear Association	5.544	1	.019		
N of Valid Cases	664				

N=664

There was a statistically significant association, $X^2(1, N = 664) = 22.63$, $p = .000$, between Sport Coached (Volleyball) and classifying Human Growth Hormone (HGH) as a PED (see Table 45).

Table 45
Chi-square test: Sport Coached (Volleyball) and Human Growth Hormone (HGH)

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	22.627[a]	1	.000		
Continuity Correction[b]	21.180	1	.000		
Likelihood Ratio	19.263	1	.000		
Fisher's Exact Test				.000	.000
Linear-by-Linear Association	22.592	1	.000		
N of Valid Cases	664				

N=664

There was a statistically significant association, $X^2(1, N = 664) = 6.02$, $p = .01$, between Sport Coached (Wrestling) and classifying Diuretics as a PED (see Table 46).

Table 46
Chi-square test: Sport Coached (Wrestling) and Diuretics

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	6.023[a]	1	.014		

Continuity Correction[b]	5.372	1	.020		
Likelihood Ratio	5.596	1	.018		
Fisher's Exact Test				.020	.012
Linear-by-Linear Association	6.014	1	.014		
N of Valid Cases	664				

N=664

There was a statistically significant association, $X^2(1, N = 664) = 5.65$, $p = .02$, between Sport Coached (Wrestling) and classifying Marijuana as a PED (see Table 47).

Table 47
Chi-square test: Sport Coached (Wrestling) and Marijuana

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	5.651[a]	1	.017		
Continuity Correction[b]	4.810	1	.028		
Likelihood Ratio	4.944	1	.026		
Fisher's Exact Test				.026	.018
Linear-by-Linear Association	5.642	1	.018		
N of Valid Cases	664				

N=664

There was a statistically significant association, $X^2(1, N = 664) = 4.35$, $p = .04$, between Sport Coached (Wrestling) and classifying Tobacco Products as a PED (see Table 48).

Table 48
Chi-square test: Sport Coached (Wrestling) and Tobacco Products

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	4.346[a]	1	.037		
Continuity Correction[b]	3.421	1	.064		
Likelihood Ratio	3.692	1	.055		
Fisher's Exact Test				.056	.039
Linear-by-Linear Association	4.340	1	.037		
N of Valid Cases	664				

N=664

There was a statistically significant association, $X^2(1, N = 664) = 4.96$, $p = .03$, between Sport Coached (Other) and classifying Diuretics as a PED (see Table 49).

Table 49
Chi-square test: Sport Coached (Other) and Diuretics

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	4.960[a]	1	.026		
Continuity Correction[b]	3.772	1	.052		
Likelihood Ratio	4.261	1	.039		
Fisher's Exact Test				.041	.032
Linear-by-Linear Association	4.953	1	.026		
N of Valid Cases	664				

N=664

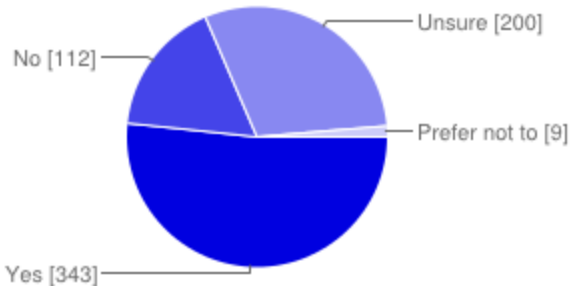
Research Question #2

The second research question asked coaches to identify if they wish to implement drug testing on high school athletes. From a list of options, participants were allowed to select one of four choices: “yes”, “no”, “unsure”, and “prefer not to say.” Regardless of demographic variables, overall responses for each selection are listed in Table 50.

Table 50
Research Question #2 Non-demographic Response Rate

Response	Frequency	Percentage
Yes	343	51.7
No	112	16.9
Unsure	200	30.1
Prefer Not to Say	9	1.4

N=664



To examine the demographic variables of research question #2, a Chi-square test was performed on each of the independent variables determine if differences existed between high school athletic coaches of certain demographic categories and their opinions regarding the testing of high school athletes for performance enhancing drugs. Results of the statistically significant analyses are listed below and have corresponding tables.

Gender

There was a statistically significant association, $X^2(3, N = 664) = 10.27$, $p = .02$, between Gender and opinion regarding testing for performance enhancing drugs (see Table 51)

Table 51
Chi-square test: Gender and Opinion on Testing

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	10.273[a]	3	.016
Likelihood Ratio	10.539	3	.014
Linear-by-Linear Association	7.668	1	.006
N of Valid Cases	664		

N=664

Years in Coaching

There was not a statistically significant association between the number of years coaching high school sports and opinion regarding testing for performance enhancing drugs.

Coaching Certification

There was not a statistically significant association between coaching certification and opinion regarding testing for performance enhancing drugs.

Paid versus Volunteer Status

There was not a statistically significant association between paid versus volunteer status and opinion regarding testing for performance enhancing drugs.

Athletic Level Coached

There was not a statistically significant association between athletic level coached and opinion regarding testing for performance enhancing drugs.

Sports Coached

There was a statistically significant association, X(3, N = 664) = 14.27, p = .003, between sport coached (Baseball) and opinion regarding testing for performance enhancing drugs (see Table 52)

Table 52
Chi-Square test: Sport Coached (Baseball) and Opinion on Testing

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	14.269[a]	3	.003
Likelihood Ratio	17.647	3	.001
Linear-by-Linear Association	11.436	1	.001
N of Valid Cases	664		

N=664

There was a statistically significant association, X(3, N = 664) = 7.24, p = .07, between sport coached (Golf (Boys)) and opinion regarding testing for performance enhancing drugs (see Table 53)

Table 53
Chi-Square test: Sport Coached (Golf (Boys)) and Opinion on Testing

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	7.243[a]	3	.065
Likelihood Ratio	5.736	3	.125
Linear-by-Linear Association	.099	1	.753
N of Valid Cases	664		

N=664

There was a statistically significant association, X(3, N = 664) = 7.51, *p* = .06, between sport coached (Volleyball) and opinion regarding testing for performance enhancing drugs (see Table 54)

Table 54
Chi-Square test: Sport Coached (Volleyball) and Opinion on Testing

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	7.510[a]	3	.057
Likelihood Ratio	8.185	3	.042
Linear-by-Linear Association	4.153	1	.042
N of Valid Cases	664		

N=664

Research Question #3

The third research question asked coaches to identify a level of punishment associated with three separate positive performance enhancing drug tests. For each positive test, participants were allowed to select one of five choices on a Likert-type scale: “warning”, “one game suspension,” “multiple game suspension,” “season suspension,” and “lifetime suspension.” Regardless of demographic variables, overall responses for each selection are listed in Tables 55-57.

Table 55
Research Question #3 Non-demographic Response Rate to First Offense

Punishment	Frequency	Percent
Warning	103	15.5
One Game Suspension	284	42.8
Multiple Game Suspension	225	33.9
Season Suspension	51	7.7

Lifetime Suspension	1	0.2

N=664

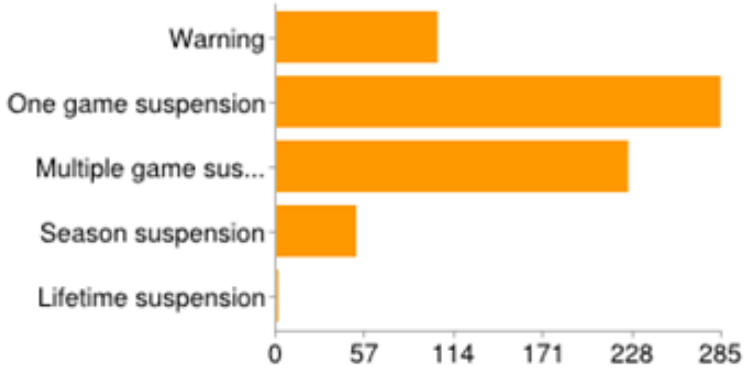


Table 56

Research Question #3 Non-demographic Response Rate to Second Offense

Punishment	Frequency	Percent
Warning	3	0.5
One Game Suspension	56	8.4
Multiple Game Suspension	221	33.3
Season Suspension	327	49.2
Lifetime Suspension	57	8.6

N=664

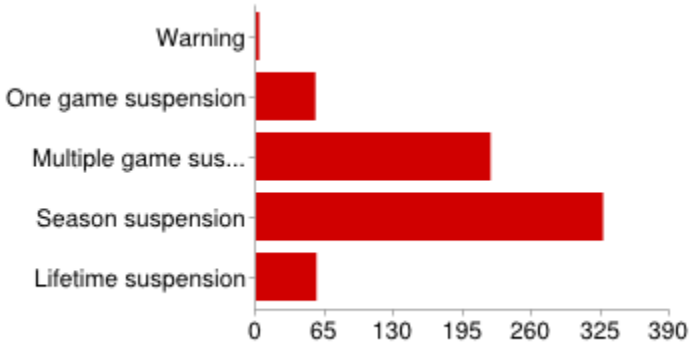
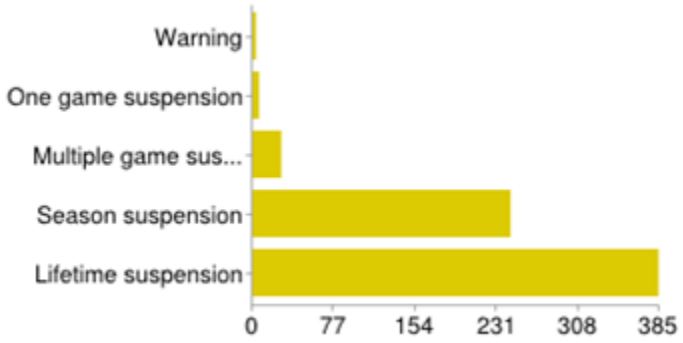


Table 57
Research Question #3 Non-demographic Response Rate to Third Offense

Punishment	Frequency	Percent
Warning	3	0.5
One Game Suspension	6	0.9
Multiple Game Suspension	27	4.1
Season Suspension	244	36.7
Lifetime Suspension	384	57.8

N=664



To examine the demographic variables of research question #3, an ANOVA test was performed on each of the offense levels determine if differences existed between high school athletic coaches of certain demographic categories and their opinions regarding a level of punishment associated with positive performance enhancing drug tests. Due to several Levene's tests being statistically significant, indicating that the assumption of homogeneity of variance had been violated, the following reported results were obtained using the Welch's test for unequal variances (Ruxton, 2006). Results of the statistically significant analyses are listed below and have corresponding tables.

First Offense

Gender

There was a statistically significant difference between men's and women's opinions on punishment for a first offense, $F(1, 663) = 10.41$, $p = .001$. On average, men (M = 2.39, SD = .85) indicated harsher punishments than did women (M = 2.15, SD = .78) for a first offense (see Table 58).

Table 58
Analysis of Variance: First Offense and Gender

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	6.491	1	6.491	10.41	.001
Within Groups	456.905	662	.690		
Total	463.396	663			

N=664

Years in Coaching

There was not a statistically significant difference between years coaching in high school and opinions on punishment for a first offense.

Coaching Certification

There was not a statistically significant difference between coaching certification and opinions on punishment for a first offense.

Paid versus Volunteer Status

There was not a statistically significant difference between paid versus volunteer status and opinions on punishment for a first offense.

Athletic Level Coached

There was a statistically significant difference between Reserve and non-Reserve coaches' opinions on punishment for a first offense, $F(1, 663) = 4.23$, $p = .04$. On average, non-

Reserve coaches (M = 2.40, SD = .81) indicated harsher punishments than did Reserve coaches (M = 2.27, SD = .87) for a first offense (see Table 59).

Table 59
Analysis of Variance: First Offense and Athletic Level Coached (Reserve)

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	3.001	1	3.001	4.232	.040
Within Groups	460.395	662	.695		
Total	463.396	663			

N=664

Sports Coached

There was a statistically significant difference between Boys Cross Country and non-Boys Cross Country coaches' opinions on punishment for a first offense, F(1, 663) = 7.63, p = .01. On average, Boys Cross Country coaches (M = 2.65, SD = .82) indicated harsher punishments than did non-Boys Cross Country coaches (M = 2.32, SD = .83) for a first offense (see Table 60).

Table 60
Analysis of Variance: First Offense and Sport Coached (Cross Country(Boys))

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	5.145	1	5.145	7.626	.008
Within Groups	458.251	662	.692		
Total	463.396	663			

N=664

There was a statistically significant difference between Girls Cross Country and non-Girls Cross Country coaches' opinions on punishment for a first offense, F(1, 663) = 4.75, p = .03. On average, Girls Cross Country coaches (M = 2.57, SD = .82) indicated harsher punishments than did non-Girls Cross Country coaches (M = 2.32, SD = .84) for a first offense (see Table 61).

Table 61
Analysis of Variance: First Offense and Sport Coached (Cross Country (Girls))

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	3.169	1	3.169	4.752	.033
Within Groups	460.227	662	.695		
Total	463.396	663			

N=664

There was a statistically significant difference between Boys Tennis and non-Boys Tennis coaches' opinions on punishment for a first offense, F(1, 663) = 6.38, p = .03. On average, Boys Tennis coaches (M = 2.86, SD = .77) indicated harsher punishments than did non-Boys Tennis coaches (M = 2.33, SD = .83) for a first offense (see Table 62).

Table 62
Analysis of Variance: First Offense and Sport Coached (Tennis (Boys))

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	3.797	1	3.797	6.376	.025
Within Groups	459.599	662	.694		
Total	463.396	663			

N=664

There was a statistically significant difference between Volleyball and non-Volleyball coaches' opinions on punishment for a first offense, F(1, 663) = 5.29, p = .02. On average, non-Volleyball coaches (M = 2.38, SD = .84) indicated harsher punishments than did Volleyball coaches (M = 2.19, SD = .82) for a first offense (see Table 63).

Table 63
Analysis of Variance: First Offense and Sport Coached (Volleyball)

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	3.564	1	3.564	5.290	.023
Within Groups	459.832	662	.695		
Total	463.396	663			

N=664

Second Offense

Gender

There was a statistically significant difference between men's and women's opinions on punishment for a second offense, F(1, 663) = 11.44, p = .001. On average, men (M = 3.62, SD = .78) indicated harsher punishments than did women (M = 3.38, SD = .75) for a second offense (see Table 64).

Table 64
Analysis of Variance: Second Offense and Gender

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	6.556	1	6.556	11.442	.001
Within Groups	400.117	662	.604		
Total	406.673	663			

N=664

Years in Coaching

There was a significant correlation between years coaching in high school and punishment for a second offense, r(662) = -.08, p = .04. As the number of years spent coaching in high school increased, the severity of a punishment for a second offense decreased. The number of years spent coaching in high school was a significant predictor of punishment for a second offense, R2 = .006, F(1, 662) = 4.16, p = .04 (see Table 65).

Table 65
Analysis of Variance: Second Offense and Years in Coaching

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	2.538	1	2.538	4.158	.042
	Residual	404.135	662	.610		
	Total	406.673	663			

N=664

Coaching Certification

There was not a statistically significant difference between coaching certification and opinions on punishment for a second offense.

Paid versus Volunteer Status

There was not a statistically significant difference between Paid versus volunteer status and opinions on punishment for a second offense.

Athletic Level Coached

There was a statistically significant difference between Reserve and non-Reserve coaches' opinions on punishment for a second offense, $F(1, 663) = 4.52$, $p = .03$. On average, non-Reserve coaches ($M = 3.63$, $SD = .74$) indicated harsher punishments than did Reserve coaches ($M = 3.50$, $SD = .83$) for a second offense (see Table 66).

Table 66
Analysis of Variance: Second Offense and Athletic Level Coached (Reserve)

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	2.837	1	2.837	4.523	.034
Within Groups	403.836	662	.610		
Total	406.673	663			

N=664

Sports Coached

There was a statistically significant difference between Boys Cross Country and non-Boys Cross Country coaches' opinions on punishment for a second offense, $F(1, 663) = 9.59$, $p = .003$. On average, Boys Cross Country coaches ($M = 3.86$, $SD = .69$) indicated harsher punishments than did non-Boys Cross Country coaches ($M = 3.55$, $SD = .79$) for a second offense (see Table 67).

Table 67
Analysis of Variance: Second Offense and Sport Coached (Cross Country (Boys))

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	4.709	1	4.709	9.585	.003
Within Groups	401.964	662	.607		
Total	406.673	663			

N=664

There was a statistically significant difference between Girls Cross Country and non-Girls Cross Country coaches' opinions on punishment for a second offense, $F(1, 663) = 6.23$, $p = .02$. On average, Girls Cross Country coaches (M = 3.80, SD = .68) indicated harsher punishments than did non-Girls Cross Country coaches (M = 3.55, SD = .79) for a second offense (see Table 68).

Table 68
Analysis of Variance: Second Offense and Sport Coached (Cross Country (Girls))

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	2.989	1	2.989	6.231	.015
Within Groups	403.684	662	.610		
Total	406.673	663			

N=664

There was a statistically significant difference between Boys Tennis and non-Boys Tennis coaches' opinions on punishment for a second offense, $F(1, 663) = 13.82$, $p = .002$. On average, Boys Tennis coaches (M = 4.29, SD = .73) indicated harsher punishments than did non-Boys Tennis coaches (M = 3.56, SD = .78) for a second offense (see Table 69).

Table 69
Analysis of Variance: Second Offense and Sport Coached (Tennis (Boys))

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	7.310	1	7.310	13.816	.002
Within Groups	399.363	662	.603		
Total	406.673	663			

N=664

There was a statistically significant difference between Girls Tennis and non-Girls Tennis coaches' opinions on punishment for a second offense, $F(1, 663) = 17.93$, $p = .001$. On average, Girls Tennis coaches (M = 4.31, SD = .73) indicated harsher punishments than did non-Girls Tennis coaches (M = 3.56, SD = .78) for a second offense (see Table 70).

Table 70
Analysis of Variance: Second Offense and Sport Coached (Tennis (Girls))

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	7.200	1	7.200	17.932	.001
Within Groups	399.473	662	.603		
Total	406.673	663			

N=664

There was a statistically significant difference between Volleyball and non-Volleyball coaches' opinions on punishment for a second offense, $F(1, 663) = 7.58$, $p = .01$. On average, non-Volleyball coaches (M = 3.61, SD = .78) indicated harsher punishments than did Volleyball coaches (M = 3.40, SD = .78) for a second offense (see Table 71).

Table 71
Analysis of Variance: Second Offense and Sport Coached (Volleyball)

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	4.706	1	4.706	7.577	.006
Within Groups	401.967	662	.607		
Total	406.673	663			

N=664

Third Offense

Gender

There was a statistically significant difference between men's and women's opinions on punishment for a third offense, $F(1, 663) = 7.44$, $p = .007$. On average, men (M = 4.54, SD =

.66) indicated harsher punishments than did women (M = 4.37, SD = .67) for a third offense (see Table 72).

Table 72
Analysis of Variance: Third Offense and Gender

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	3.275	1	3.275	7.440	.007
Within Groups	288.701	662	.436		
Total	291.976	663			

N=664

Years in Coaching

There was not a statistically significant difference between years coaching in high school and opinions on punishment for a third offense.

Coaching Certification

There was not a statistically significant difference between coaching certification and opinions on punishment for a third offense.

Paid versus Volunteer Status

There was not a statistically significant difference between paid versus volunteer status and opinions on punishment for a third offense.

Athletic Level Coached

There was a statistically significant difference between Freshman and non-Freshman coaches' opinions on punishment for a third offense, $F(1, 663) = 6.06$, $p = .01$. On average, non-Freshman coaches (M = 4.57, SD = .60) indicated harsher punishments than did Freshman coaches (M = 4.44, SD = .72) for a third offense (see Table 73).

Table 73
Analysis of Variance: Third Offense and Athletic Level Coached (Freshman)

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	2.654	1	2.654	6.059	.014
Within Groups	289.322	662	.437		
Total	291.976	663			

N=664

There was a statistically significant difference between Reserve and non-Reserve coaches' opinions on punishment for a third offense, F(1, 663) = 6.91, p = .01. On average, non-Reserve coaches (M = 4.57, SD = .60) indicated harsher punishments than did Reserve coaches (M = 4.43, SD = .73) for a third offense (see Table 74).

Table 74
Analysis of Variance: Third Offense and Athletic Level Coached (Reserve)

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	3.168	1	3.168	6.905	.009
Within Groups	288.808	662	.436		
Total	291.976	663			

N=664

There was a statistically significant difference between Junior Varsity and non-Junior Varsity coaches' opinions on punishment for a third offense, F(1, 663) = 4.26, p = .04. On average, non-Junior Varsity coaches (M = 4.58, SD = .57) indicated harsher punishments than did Junior Varsity coaches (M = 4.47, SD = .70) for a third offense (see Table 75).

Table 75
Analysis of Variance: Third Offense and Athletic Level Coached (Junior Varsity)

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	1.590	1	1.590	4.256	.040
Within Groups	290.386	662	.439		
Total	291.976	663			

N=664

Sports Coached

There was a statistically significant difference between Baseball and non-Baseball coaches' opinions on punishment for a third offense, F(1, 663) = 8.64, p = .004. On average, Baseball coaches (M = 4.69, SD = .47) indicated harsher punishments than did non-Baseball coaches (M = 4.49, SD = ..68) for a third offense (see Table 76).

Table 76
Analysis of Variance: Third Offense and Sport Coached (Baseball)

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	2.050	1	2.050	8.635	.004
Within Groups	289.926	662	.438		
Total	291.976	663			

N=664

There was a statistically significant difference between Boys Soccer and non-Boys Soccer coaches' opinions on punishment for a third offense, F(1, 663) = 5.55, p = .03. On average, non-Boys Soccer coaches (M = 4.52, SD = .66) indicated harsher punishments than did Boys Soccer coaches (M = 4.17, SD = .62) for a third offense (see Table 77).

Table 77
Analysis of Variance: Third Offense and Sport Coached (Soccer (Boys))

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	2.131	1	2.131	5.550	.030
Within Groups	289.845	662	.438		
Total	291.976	663			

N=664

There was a statistically significant difference between Boys Swimming/Diving and non-Boys Swimming/Diving coaches' opinions on punishment for a third offense, F(1, 663) = 4.83, p = .05. On average, Boys Swimming/Diving coaches (M = 4.80, SD = .42) indicated harsher

punishments than did non-Boys Swimming/Diving coaches (M = 4.50, SD = .67) for a third offense (see Table 78).

Table 78
Analysis of Variance: Third Offense and Sport Coached (Swimming/Diving (Boys))

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	.877	1	.877	4.827	.054
Within Groups	291.098	662	.440		
Total	291.976	663			

N=664

There was a statistically significant difference between Boys Tennis and non-Boys Tennis coaches' opinions on punishment for a third offense, F(1, 663) = 5.99, p = .03. On average, Boys Tennis coaches (M = 4.79, SD = .43) indicated harsher punishments than did non-Boys Tennis coaches (M = 4.50, SD = .68) for a third offense (see Table 79).

Table 79
Analysis of Variance: Third Offense and Sport Coached (Tennis (Boys))

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	1.119	1	1.119	5.987	.028
Within Groups	290.857	662	.439		
Total	291.976	663			

N=664

There was a statistically significant difference between Girls Tennis and non-Girls Tennis coaches' opinions on punishment for a third offense, F(1, 663) = 4.66, p = .05. On average, Girls Tennis coaches (M = 4.77, SD = .44) indicated harsher punishments than did non-Girls Tennis coaches (M = 4.50, SD = .67) for a third offense (see Table 80).

Table 80
Analysis of Variance: Third Offense and Sport Coached (Tennis (Girls))

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	.919	1	.919	4.657	.050
Within Groups	291.057	662	.440		
Total	291.976	663			

N=664

There was a statistically significant difference between Volleyball and non-Volleyball coaches' opinions on punishment for a third offense, F(1, 663) = 8.08, p = .01. On average, non-Volleyball coaches (M = 4.54, SD = .65) indicated harsher punishments than did Volleyball coaches (M = 4.35, SD = .70) for a third offense (see Table 81).

Table 81
Analysis of Variance: Third Offense and Sport Coached (Volleyball)

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	3.824	1	3.824	8.078	.005
Within Groups	288.152	662	.435		
Total	291.976	663			

N=664

Summary

This chapter began with a review of the need for the study, the purpose of the study, response rate to the survey, procedures associated with data collection, and research questions related to the study. A description of the demographic characteristics of the 664 participating coaches was detailed, including frequency and percentage of responses for each of the independent variable questions. Responses to each independent variable question were examined using descriptive statistics, including frequencies and means. For research question #1 and #2, Chi-square tests were performed on each of the independent variables to determine if

differences existed. For research question #3, ANOVA tests were performed on each of the independent variables to determine if differences existed.

The purpose of this study was to determine if differences existed between high school athletic coaches of certain demographic categories and their opinions regarding the classification, testing, and punishment associated with performance enhancing drug use by high school athletes. The data analysis suggested that there were statistical implications in coaches' opinions for each of the three research questions surveyed. Chapter 5 will provide an interpretation of the data analysis and conclusions in relation to the researcher's personal experiences and the items discussed in the review of literature. Recommendations for future research, policy amendments, and the researcher's future career goals will also be discussed.

CHAPTER V: DISCUSSION AND SUMMARY

The purpose of this study was to determine if differences existed among high school athletic coaches of certain demographic categories and their opinions regarding the classification, testing, and punishment associated with performance enhancing drug use by high school athletes. Understanding high school athletic coaches' current opinions on performance drugs was an integral piece to determining a need for continuity in performance enhancing testing and education in high school athletics. A quantitative research study was conducted to determine if differences existed between variables. During analysis, the independent variables for the sample of high school athletic coaches were gender, years in high school coaching, paid versus volunteer status, grade level(s) coached, and sport(s) coached. Dependent variables for the sample of high school athletic coaches included personal classification of performance enhancing drugs (PEDs), level of desire to implement testing of PEDs, and opinion on punishment levels associated with assumed PED testing. A purposeful sample of high school athletic coaches from Midwestern school districts were selected to complete a questionnaire regarding performance enhancing drug classification, testing, and punishment in high school athletics. Based on the results of the statistical analysis, changes in performance enhancing drug testing and education will be recommended for the population, other regional coaching associations, and possibly, high school athletics nationwide. This chapter will include the study summary, a summary of findings with conclusions, and recommendations for high school athletic coaches, educators, and administrators. In addition, the researcher will discuss the limitations of the study and possible avenues of future research related to the study.

Study Summary

Being a professional athlete is a very lucrative career path. Since only a small portion of individuals excel in athletics at the highest level, there is immense pressure to perform. Society's

expectations on winning and obtaining college level scholarships places unwanted stress to perform at an extraordinary level. This may cause some athletes turn to PEDs to accelerate this process. PEDs, are a wide range of substances used to increase any athletic skill an athlete wishes to improve. When professional athletes are caught using PEDs it gives the appearance that cheating is the only way to get ahead and certainly has an impact on high school and collegiate athletes striving to participate at the professional level. Many professional athletes are considered role models and if they are experiencing the ultimate success using PEDs it makes sense to at least sample the possibility.

Drug use at any age is extremely dangerous when not controlled by a medical professional, and PEDs are no exception. Like many other controlled substances, PEDs can have lasting health effects. Many would argue that the rewards of PED usage outweigh the risks. Professional athletics and celebrity status often attached to PEDs, are qualities essentially alluring to a 17 year old high school athlete.

Society has witnessed professional athletes slapped on the wrist for PEDs usage while sports media outlets focus on record breaking accomplishments. This mixed message blurs the lines of right and wrong in young athletes and may further persuade amateur athletes to sample PEDs. Society establishes laws to deter people from drug use, but the same is not true in all levels of athletics. High school athletics depend on the individual state's laws and many states do not have testing for PEDs even if an athlete is suspected of using them.

The researcher’s lifelong experience in athletics has allowed him to be been privy to observing and hearing multiple accounts of PED usage in athletics. From chewing tobacco to the amount of over-the-counter-drugs available at nutrition stores, the researcher has seen abuse of PEDs in many forms. The problem is that previous studies regarding high school drug testing

focused only on schools where enough athletes were using PEDs that it had become public knowledge. Furthermore, these studies addressed a limited amount of PEDs and only those types known to have been abused. In each study, input was lacking from high school athletic coaches whose knowledge of PEDs and time spent with high school athletes would allow for a broader ability to detect abuse.

A survey of high school athletic coaches provides a starting ground regarding the establishment of PED testing in states where no such rule exists. Specifically the researcher sought to gain information that is not currently in the literature. Although there have been multiple forms of PEDs throughout history, there is currently greater attention on them and their various forms due to increased regulation and definition of associated punishment. However, what is considered a PED may be open to interpretation. While the World Anti-Doping Agency (WADA) list is extensive and accepted worldwide, it has not been recognized in many American professional sporting leagues. Instead, these organizations create their own list of substances and testing procedures through a collective bargaining which create varying procedures and punishments. Particularly at the high school level, testing is dramatically reduced, if not completely obsolete. The possible lack of policing may lead some high school athletes to abuse performance enhancing drugs because there is often no way to detect usage, nor is there a natural consequence issued by the district.

The legal cases associated with high school drug testing have multiple items in common regarding the legality of implementing drug testing policies in high schools. Among these are the following. Initially, policies must be derived by reasonable cause or suspicion, additionally, implementing a drug testing policy for the sake of gathering data is not enough and an outside agency can provide survey data to each school or district that would justify further inquiry.

Next, if data suggests concerns with student drug or alcohol abuse, then districts can establish a task force including, but not limited to: administration, board of education members, parents, and teachers. This group would then develop a drug testing policy that would best suit the needs of the district and its students. The policy must not punish a student's academic standing and information from testing may not be released to the public as minors and medical information are both protected by law. Finally, testing usually consists of random urine analysis, but further lab results can be established on a need-by-need basis. Cost and time restrictions prevent testing all students with a full toxicology report.

When the common stipulations found in current cases are not followed by districts, the courts tend to rule in favor of parents who are suing on behalf of their children. The cases appeared to be equally divided between parents who are covering for their children's poor decisions or standing up for their constitutional rights. The 4th and 14th amendments were commonly referred to in almost all of the court cases. These amendments, the right against unreasonable searches and the right to due process respectively, were used by attorneys in these cases because many of the school's drug testing policies involved selecting random students without cause to be tested (Cornell Law, 2013).

On-field punishments may be the least of players' concerns as the long-term effects on their physical and mental health may be debilitating. While parents may ultimately be responsible for monitoring their child's wellbeing, high school athletic coaches sometimes spend more time with high school students, and have more of an impact on their lives, than parents. High school athletic coaches may also be more responsible for player safety, mentally and physically, than parents. Therefore, the importance of establishing a baseline of opinions from high school coaches regarding implementation and testing of high school athletes is significant.

Method Summary

To determine if differences existed between variables, the researcher conducted a quantitative research study by analyzing results of an electronic survey completed by high school athletic coaches (see Appendix A for high school athletic coaches' electronic survey). The electronic survey contained a series of questions related to demographic information of high school athletic coaches, in addition to their opinions regarding the classification, testing, and punishment associated with performance enhancing drug use by high school athletes.

During analysis, the independent variables for the sample of high school athletic coaches were gender, years in high school coaching, paid versus volunteer status, grade level(s) coached, and sport(s) coached. Dependent variables for the sample of high school athletic coaches included personal classification of performance enhancing drugs (PEDs), level of desire to implement testing of PEDs, and opinion on punishment levels associated with assumed PED testing.

This particular study utilized a quantitative design by statistically analyzing high school athletic coaches' answers to an electronic survey. Analysis included descriptive statistics, Chi-square, and ANOVA and was discussed in detail in the data analysis section.

Figure 5. Research Design

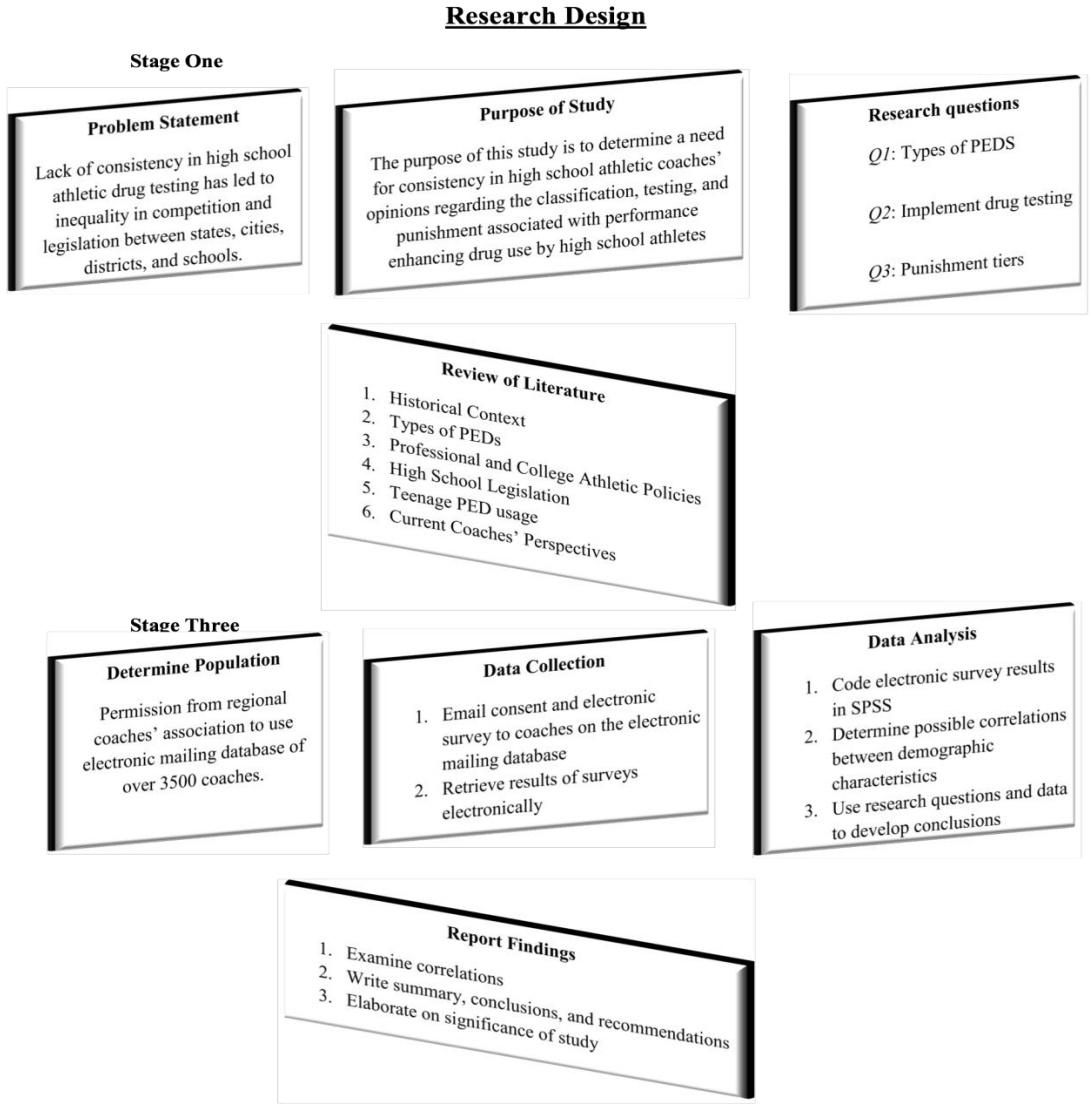


Figure 5. Design of research by Greco (2014).

The total sample was determined by an electronic mailing list provided by a regional coaches' association. From the total sample, no formula was used to determine a total sample size as Sue & Ritter (2013) suggest a sample size of between 30 to 500 participants, or 10% of the parent population. High school athletic coaches varied in age, gender, experience, sports coached, and level coached. Data collection for this study was in the form of an electronic

survey and because it was newly designed for this study by the researcher, required review to test for validity and reliability of questions.

To increase the content validity of the electronic survey, the researcher provided a draft of the electronic survey to ten high school athletic coaches. These high school athletic coaches reviewed the electronic survey for clarity, accuracy, and flow. Furthermore, during this process, the researcher replicated the delivery, instruction, and procedures associated with the actual study participants to ensure perspicuity.

Demographic data regarding years in coaching was measured on a continuous variable scale. Demographic data regarding gender, paid versus volunteer status, sport(s) coached, and grade level(s) coached was measured on a categorical variable scale. An ordinal Likert scale of 1 representing "warning" to 5 representing "lifetime suspension" was used with questions related to participants' opinions of punishment levels associated with positive PED tests. Data for each of the independent variable categories of gender, years in high school coaching, paid versus volunteer status, grade level(s) coached, and sport(s) coached was compared to the dependent variables of personal classification of PEDs, level of desire to implement testing, and opinion on punishment levels associated with assumed PED testing.

Research Questions and Interpretation

Utilizing the electronic survey, the researcher addressed the following questions:

Q1: What do high school athletic coaches of certain demographic categories consider a PED?

Q2: Do high school athletic coaches of certain demographic categories wish to implement drug testing on high school athletes?

Q3: Are there differences among high school athletic coaches' views, based on demographic categories, on punishments for a student athlete's positive performance enhancing drug test?

Figure 7. Research Question/Data Analysis Pairing

Research Question	Survey Question(s)	Data Analysis
Q1: What do high school athletic coaches of certain demographic categories consider a PED?	Demographic information Which of the following would you consider a performance enhancing drug?	Summary of descriptive statistics Chi-square
Q2: Do high school athletic coaches of certain demographic categories wish to implement drug testing on high school athletes?	Demographic information Should high school athletes be tested for performance enhancing drugs?	Summary of descriptive statistics Chi-square
Q3: Are there differences among high school athletic coaches' views, based on demographic categories, on punishments for a student athlete's positive performance enhancing drug test?	Demographic information Assuming performance enhancing drug testing was implemented, what level of punishment should be associated with positive tests	Summary of descriptive statistics ANOVA Welch's test

Figure 7. Pairing of research questions from electronic survey to SPSS analysis type by researcher Greco (2014).

Demographic Summary

The total population for the study consisted of coaches from a regional coaching association. All coaches who provided their electronic email address to the regional coaches' association were invited to participate in the study. From the total population of 3565 coaches,

664 high school athletic coaches completed the electronic survey for a response rate of 18.6%. The survey began with demographic questions including the independent variables of gender, years in high school coaching, paid versus volunteer status, grade level(s) coached, and sport(s) coached.

The first demographic question asked participants to identify their gender. Five hundred and twenty eight males represented 79.5% of the sample population. One hundred and thirty six females represented 20.5% of the sample population (see Table 1). The results are not surprising to the researcher, as in his experience, the majority of high school athletic coaches have been male and society typically places coaching as a male gender role.

The second demographic question asked participants to identify how many years they had been coaching at the high school level by inputting a whole number into a text box. Values ranged from a minimum of "1" year to a maximum of "52" years with a standard deviation of 11.12 years. The mean value for years of coaching was 16.63 years (see Table 2). Sixteen years of coaching is a career to some individuals, so for it to be the average for the sample population was impressive and surprising to the researcher.

The third demographic question asked participants to identify their coaching certification type by selecting "yes" if they currently held a state coaching endorsement or "no" if they did not currently hold a state coaching endorsement. Four hundred and sixty six respondents, representing 70.2% of the sample population, held a state coaching endorsement. One hundred and ninety eight respondents, representing 29.8% of the sample population, did not hold a state coaching endorsement (see Table 3). A coaching endorsement may be as simple as contacting the state department of education and applying or taking a few extra classes in college. Either way, the results are indicative of not only the ease, but the desire of most high school athletic

coaches to be recognized as professionals in their craft. Furthermore, membership in a regional coaching association is another way to be recognized as a professional, and may also be associated with higher rates of coaching certification.

The fourth demographic question asked participants to identify their status as a coach. From a dropdown box, participants were able to select one of four choices: paid head coach, paid assistant coach, volunteer head coach, and volunteer assistant coach. More than 90% of high school athletic coaches who participated in the survey were paid, while less than 3% were volunteer coaches (see Table 4). Similar to coaching certification, individuals who are members of a regional coaches' association may be more likely to be compensated for their services as a coach since the fee for membership is $40 per year.

The fifth demographic question asked participants to identify the grade level(s) they coached at the high school level. Some participants coached multiple levels during different seasons. From a list of multiple responses, participants were able to select: freshman, reserve, junior varsity, and/or varsity. Of the 664 participants, 637 had involvement at the varsity level, indicating that many high school athletic coaches help athletes at multiple levels of the same sport (see Table 5). This is especially true in football where freshman level coaches often help out the varsity team by filming games or scouting opponents.

The sixth demographic question asked participants to identify the type of sport they coached at the high school level. Some participants coached multiple sports during different seasons. From a list of multiple responses selected form an athletic association of which the regional coaches' association is a part, participants were able to select from nineteen sports and/or "other" in case their sport or activity was not included on the original list (see table 6). Football, track (boys and girls), and basketball (boys and girls), were the most commonly

selected sports representing 65.4% of the total selections for this question. Swimming/Diving (boys and girls), soccer (boys and girls), and tennis (boys and girls) were the least selected sports representing 4.52% of the total selections for this question. While there may be many theories as to which sports are more represented, it is important to note that the study's results may be influenced by responses representing a smaller range of sports. These influences will be further discussed in the research questions results and in the limitations of the study.

Research Question Summary

The first research question asked participants to identify what they consider a performance enhancing drug (PED) from a list of multiple responses selected from a combination of seventeen PEDs listed on the World Anti-Doping Agency (WADA) banned list and the researcher's personal observations (see table 7). Regardless of demographics, the top three chosen PED's were "Anabolic Steroids," "Human Growth Hormone (HGH)," and "Blood Doping." The high response rate for these items may be due to increased media coverage of these three PEDs in the last 20 years. "Sports drinks" and "tobacco" were the least selected items on the PED list. Both items were added from the researcher's personal observations and did not appear on the WADA list. Their lack of selection speaks to the culture of sports where certain drugs, like tobacco, are viewed as dangerous and are outlawed at most levels, but are not considered a PED by this regional coaches' association. Finally, although "none of the above" is not considered a PED, the fact that it had the lowest selection rate (0.45%) provides hope that PED awareness is high within the regional coaches' association.

When demographics were factored into the analysis, a chi-square test was performed to determine if differences existed. A summary of the statistically significant results can be seen in Tables 82 and 83.

Table 82
Summary of Results: Demographics (non sport coached) and PED Selection

Demographic Variable	PED Selection	P Value
Gender	Blood Doping	.03
	Gene Manipulation	.01
	Human Growth Hormone(HGH)	.00
	Pain Cream	.05
Coaching Certification	Alcohol	.00
	Blood Doping	.01
	Human Growth Hormone(HGH)	.01
	Marijuana	.01
	Tobacco	.05
Athletic Level Coached (Freshman)	Gene Manipulation	.02
Athletic Level Coached (Reserve)	Diuretics	.02
	Gene Manipulation	.01
	Morphine	.03
	Tobacco	.03
Athletic Level Coached (J.V.)	Anabolic Steroids	.02
	Diuretics	.03

N=664

Table 83
Summary of Results: Demographics (sport coached) and PED Selection

Sport Coached	PED Selection	P Value
Baseball	Human Growth Hormone (HGH)	.05
Basketball (Boys)	Human Growth Hormone (HGH)	.02
Basketball (Girls)	Protein Supplements	.02
Football	Adrenaline Supplements	.03
	Human Growth Hormone (HGH)	.000
	Pain Relief Cream	.02
Golf (Boys)	Beta Blockers	.02
Golf (Girls)	Hormone Antagonists	.02
Soccer (Girls)	Human Growth Hormone (HGH)	.004
Softball	Alcohol	.004
	Marijuana	.002
	Tobacco Products	.05
Tennis (Girls)	Human Growth Hormone (HGH)	.03
Track and Field (Boys)	Caffeine	.02
	Protein Supplements	.04
	Tobacco Products	.01
Track and Field (Girls)	Caffeine	.04
	Tobacco Products	.02
Volleyball	Human Growth Hormone (HGH)	.000
Wrestling	Diuretics	.01
	Marijuana	.02

	Tobacco Products	.04
Other	Diuretics	.03

N=664

In conclusion of question one, demographics play a role in determining what participants considered a PED. Four of the six categories and 19 of the 28 sub categories of demographic variables had at least one statistically significant association. "Sport coached" provided the most demographic associations at 23, while "Human Growth Hormone (HGH)" provided the most PED association at 8. As a demographic category, "years in coaching" and "paid vs. volunteer status" provided no significant associations. As a subcategory, "athletic level coached (varsity)," "sport coached (boys cross country)," "sport coached (girls cross country)," "sport coached (boys soccer)," "sport coached (boys swimming and diving)," "sport coached (girls swimming and diving)," and "sport coached (boys tennis)" provided no statistically significant associations. Regardless of category or sub category, "gender" and "coaching certification" provided the most number of significant associations at 5 each.

Results of question one are opinions of high school athletic coaches from a regional coaches' association and may only reflect a small sample of opinions in relation to athletics within specific sports. While the literature may suggest that certain drugs are more common in certain sports, it does not provide enough evidence of a correlation within the researcher's study. In addition, athletes from specific sports may also be associated with certain drugs (i.e. baseball and tobacco), but their social association would not necessarily indicate a correlation for the researcher's study.

The second research question asked participants to identify if they wish to implement drug testing on high school athletes. Participants were allowed to select one of four choices:

"yes," "no," "unsure," and prefer not to say." Regardless of demographic variables, the most selected response was "yes" and the least selected response as "prefer not to say." Just over one half of respondents wish to implement drug testing and less than one fifth of respondents did not want to implement. Results indicate a majority are interested in the idea of high school athletic drug testing.

When demographics were factored into the analysis, a chi –square test was performed to determine if differences existed. Statistically significant associations were found in "gender" and "sport coached (baseball)." A summary of the statistically significant results can be seen in Table 84.

Table 84
Summary of Results: Demographics and Drug Testing Implementation Selection

Demographic Variable	P Value
Gender	.02
Sport Coached (baseball)	.00

N=664

In conclusion of question two, demographics appear to play little role in determining high school athletic coaches' desire to implement drug testing of high school athletes. Only two of the six categories and 2 of the 28 subcategories of demographic variables had at least one statistically significant association. Those associations were in "gender" and "sport coached (baseball)" respectfully.

Results of question two are opinions of high school athletic coaches from a regional coaches' association and may only reflect a small sample of opinions in relation to high school coaches throughout the country. The literature appears to back the researcher's results as only five states have implemented high school drug testing.

The third research question asked participants to identify a level of punishment associated with three separate positive performance enhancing drug tests. For each positive test, participants were allowed to select one of five choices on a Likert-type scale: "warning", "one game suspension", "multiple game suspension", "season suspension", and "lifetime suspension." Regardless of demographic variables, the majority of participants responded with "one game suspension," "season suspension," and "lifetime suspension" for first offense, second offense, and third offense respectively. The largest changes occurred between first offense and second offense "season suspension" which jumped 41.5% and second offense and third offense "lifetime suspension" which jumped 49.2%. Results indicated the level of punishment increased with each positive test.

When demographics were factored into the analysis, an ANOVA test was performed on each of the offense levels determine if differences existed. As stated in chapter four, due to several Levene's tests being statistically significant, indicating that the assumption of homogeneity of variance had been violated, results were obtained using the Welch's test for unequal variances (Ruxton, 2006). For punishment of first offense, statistically significant associations were found in "gender," "athletic level coached (reserve)," "sport coached (cross country (boys))," "sport coached (cross country (girls))," "sport coached (tennis (boys))," and "sport coached (volleyball)." A summary of the statistically significant results can be seen in Table 85.

Table 85
Summary of Results: Demographics and Punishment Selection (First Offense)

Demographic Variable	P value	Conclusion
Gender	.001	Men indicated harsher punishments than women
Athletic Level Coached	.04	Non-reserve coached indicated

(Reserve)		harsher punishments than reserve coaches
Sport Coached (Cross Country (Boys))	.01	Boys Cross Country coaches indicated harsher punishments than non-Boys Cross Country coaches
Sport Coached (Cross Country (Girls))	.03	Girls Cross Country coaches indicated harsher punishments than did non-Girls Cross Country coaches
Sport Coached (Tennis (Boys))	.03	Boys Tennis coaches indicated harsher punishments than did non-Boys Tennis coaches
Sport Coached (Volleyball)	.02	Non-Volleyball coaches indicated harsher punishments than did Volleyball coaches

N=664

For punishment of second offense, statistically significant associations were found in "gender," "years in coaching," "athletic level coached (reserve)," "sport coached (cross country (boys))," "sport coached (cross country (girls))," "sport coached (tennis (boys))," "sport coached (tennis(girls))," and "sport coached (volleyball)." A summary of the statistically significant results can be seen in Table 86.

Table 86
Summary of Results: Demographics and Punishment Selection (Second Offense)

Demographic Variable	P Value	Conclusion
Gender	.001	Men indicated harsher punishments than women
Years in Coaching	.04	As years in coaching increased, the severity of a punishment decreased
Athletic Level Coached (Reserve)	.03	Non-reserve coached indicated harsher punishments than reserve coaches
Sport Coached (Cross Country (Boys))	.003	Boys Cross Country coaches indicated harsher punishments

		than non-Boys Cross Country coaches
Sport Coached (Cross Country (Girls))	.02	Girls Cross Country coaches indicated harsher punishments than non-Girls Cross Country coaches
Sport Coached (Tennis (Boys))	.002	Boys Tennis coaches indicated harsher punishments than non-Boys Tennis coaches
Sport Coached (Tennis (Girls))	.001	Girls Tennis coaches indicated harsher punishments than non-Girls Tennis coaches
Sport Coached (Volleyball)	.01	Non-Volleyball coaches indicated harsher punishments than did Volleyball coaches

N=664

For punishment of third offense, statistically significant associations were found in "gender," "Athletic Level Coached (Freshman)," "Athletic Level Coached (Reserve)," "Athletic Level Coached (Junior Varsity)," "Sport Coached (Baseball)," "Sport Coached (Soccer (Boys))," "Sport Coached (Swimming/Diving(Boys))," "Sport Coached (Tennis (Boys))," "Sport Coached (Tennis (Girls))," and "Sport Coached (Volleyball)." A summary of the statistically significant results can be seen in Table 87.

Table 87
Summary of Results: Demographics and Punishment Selection (Third Offense)

Demographic Variable	P Value	Conclusion
Gender	.007	Men indicated harsher punishments than women
Athletic Level Coached (Freshman)	.01	Non-Freshman coaches indicated harsher punishments than Freshman coaches
Athletic Level Coached (Reserve)	.01	Non-Reserve coaches indicated harsher punishments than Reserve coaches
Athletic Level Coached (Junior Varsity)	.04	Non-Junior Varsity coaches indicated harsher punishments than Junior Varsity coaches
Sport Coached	.004	Baseball coaches indicated

(Baseball)		harsher punishments than non-Baseball coaches
Sport Coached (Soccer (Boys))	.03	Non-Boys Soccer coaches indicated harsher punishments than Boys Soccer coaches
Sport Coached (Swimming/Diving(Boys))	.05	Boys Swimming/Diving coaches indicated harsher punishments than non-Boys Swimming/Diving coaches
Sport Coached (Tennis (Boys))	.03	Boys Tennis coaches indicated harsher punishments than non-Boys Tennis coaches
Sport Coached (Tennis (Girls))	.05	Girls Tennis coaches indicated harsher punishments than non-Girls Tennis coaches
Sport Coached (Volleyball)	.01	Non-Volleyball coaches indicated harsher punishments than Volleyball coaches

N=664

In conclusion of question three, demographics appear to play some role in determining high school athletic coaches' opinions on punishment level associated with three separate positive performance enhancing drug tests. As the amount of positive PED drug tests increased, so too did the amount of demographic variables with statistically significant associations. Specifically, the first offense yielded six subcategories with statistically significant associations, the second offense yielded seven subcategories with statistically significant associations, and the third offense yielded ten subcategories with statistically significant associations. Of the subcategories represented, "Gender," "Athletic Level Coached (Reserve)," "Sport Coached Tennis (Boys))," and "Sport Coached (Volleyball)," yielded statistically significant results in each of the three levels of offense.

Results of question three are opinions of high school athletic coaches from a regional coaches' association and may only reflect a small sample of opinions in relation to high school coaches throughout the country. Literature regarding increased punishment for each level of

offense supports the results of the researcher's study based on similar policies implemented by professional sports organizations. However, it does not provide enough evidence of a correlation between all demographics and opinions of punishment level associated with multiple positive PED tests. In addition, specific sports may also be associated with certain drugs (i.e. baseball and tobacco), which may influence a coach's opinion on appropriate punishment levels, but their social association would not necessarily indicate a correlation for the researcher's study.

Study Limitations and Delimitations

In addition to the limitations mentioned earlier in the study, the researcher found several new limitations post survey. Some individuals in the regional coaches' association had been assigned a new email within their district after they had registered for the association. Since the electronic surveys were sent through the regional coaches' association electronic mailing list, these high school athletic coaches may not have received the electronic survey. A few of the coaches may have old/new email addresses, additionally, some high school athletic coaches may have used another electronic email account to sign up for the regional coaches' association. Those high school athletic coaches who do not regularly check their email may not have completed the survey. Some school districts have filters on their servers which may have recognized the survey as SPAM or junk mail, creating a situation where the coaches were unaware the survey existed. This limited the total number of high school athletic coaches allowed to complete the survey.

In addition, there are coaches who are recognized members in the coaches' association, but are not high school athletic coaches. Instead, they are administrators or middle school athletic coaches. Although the participation invitation email contained a qualifying statement, some of these individuals may have completed the survey. Furthermore, individuals who had not

coached a high school sport in the last year may have completed the survey if they ignored the qualifying statement. While the researcher has no proof of wrong doing, he does note the opportunity for a coach to submit multiple survey entries, regardless of the intention.

In addition to the delimitations mentioned earlier in the study, the researcher found two new delimitations post survey. Due to the design of the study, there was no area for participants to make comments regarding their selections, which may have provided rationale for their decisions. Also, the survey was coincidentally administered while one of the high schools in the region was implementing a school wide drug testing policy. The media coverage of this process was extensive during the study, and may have created bias within the study population.

In addition to the post survey limitations and delimitations, the researcher acknowledges that volunteers, as opposed to paid coaches, may have been less likely to participate in the study since membership in the regional coaches' association requires a payment of $40. While the amount of money may be small to some, volunteers may consider any expense too large when they are not being paid for their services.

Future Research

Based on the findings of this study, the following recommendations are made with high school athletics and education in mind. Increasing the total number of participants may expose the survey to a wider variety of high school athletic coaching demographics and would increase the likelihood of generalization to larger populations. Although the current study included high school athletic coaches from various districts within the regional coaches association, studying opinions of high school athletic coaches from another, or multiple, regional coaches' associations would allow the researcher to compare another level of demographic influence and may increase the likelihood of generalization to larger populations. The survey population could be expanded

to included individuals with a vested interest in the well-being of student athletes. Those individuals could include administrators, teachers, officials, and parents. New populations would allow further demographic comparisons but would also add a layer of community involvement to the study's results.

In addition to other types of individuals, participants could identify the type of school (public vs private, large vs small, urban vs rural) to further add to the demographic comparisons. A second, follow-up survey could be sent to high school athletic coaches to add an additional level of reliability to the study to see if their opinions had changed since the initial survey.

The researcher is unable to speculate as to why individuals from diverse demographics selected a specific answer on each section of the survey. However, a follow up study, or question, where participants are asked about their selections may provide rationale behind the statistically significant associations. An additional qualitative survey question would have added a supplementary layer to the study and may have provided triangulation of data. A coaching seminar is a possible way of using the information to train high school athletic coaches. During a seminar, high school athletic coaches could take a pre and post survey to determine if their PED awareness had increased. Results from the pre and post surveys could be used to further train and educate high school athletic coaches.

Recommendations for Practice

Based on the findings of this study, the following recommendations are made for high school athletic coaches, administrators, and parents in order to increase awareness and limit misconceptions about PED usage in high school athletics. Based on past high school legislation detailed in Chapter 2, if drug testing is desired, one must (1) determine a need for the testing, (2) organize a committee to formalize a plan, (3) acquire acceptance for the plan, (4) implement low

level testing initially, (5) gather evidence, (6) report results without identifying students to the public, and (7) decide consistent punishment options. Specifically, high school athletic coaches should attend a preseason seminar based on the information gathered in this study. This seminar could also count for educational training hours required by states each year for a teacher to maintain his/her certification.

Conclusion

Based on the amount of participants who responded to the electronic survey, this study showed an area of need in high school athletics. If high school athletic coaches have a desire to be informed regarding PEDs, many would benefit from having the knowledge gained in this study. While the results indicate that a majority of high school athletic coaches in the regional coaches association wish to implement drug testing, the results of this study will initially provide a means of discussion within the high school athletic community regarding awareness of PED usage.

The information gained from this study can be implemented as part of preseason coaching seminars. Guest speakers who are knowledgeable of PEDs would be able to provide useful information to high school athletic coaches regarding the results of this study, thus increasing awareness at the front lines. Even if PED usage is low in a specific sport, saving one high school athlete from a life altering choice is worth the increased training for high school athletic coaches.

The results of this study have given the researcher a new perspective of all high school athletics and coaches. The evidence that high school athletic coaches from sports not traditionally associated with PED usage have an interest in drug testing suggests the need for increased education and awareness. Administrators as well as coaches can utilize the findings of

this study into all applicable areas by becoming more cognizant of PED usage and following past legislation if drug testing is needed in their school or district.

Although the history of PED usage in athletics paints a negative image of competition, America's love of sports has remained strong. The results of this study should not deter anyone from athletics or coaching in the future. The selfish acts of a few individuals should not label the countless other athletes who play clean and provide positive examples of what it means to be an athlete. From leadership growth, to team building, to overcoming setbacks, athletics give opportunities to grow in many ways other than physically. Athletics have positive effects for all ages.

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Appendix A: Coaches' Electronic Survey

Coaches' PED Survey

Gender

Years in high school coaching

Coaching Certification

- [ ] I currently hold a state coaching endorsement
- [ ] I do not currently hold a state coaching endorsement

Coaching designation

Athletic level(s) coached

Check all that apply

- [ ] Freshman
- [ ] Reserve
- [ ] Junior Varsity
- [ ] Varsity

Sport(s) coached

Check all that apply

- [ ] Baseball
- [ ] Basketball (Boys)
- [ ] Basketball (Girls)
- [ ] Cross Country (Boys)
- [ ] Cross Country (Girls)

- ☐ Football
- ☐ Golf (Boys)
- ☐ Golf (Girls)
- ☐ Soccer (Boys)
- ☐ Soccer (Girls)
- ☐ Softball
- ☐ Swimming/Diving
- ☐ Tennis (Boys)
- ☐ Tennis (Girls)
- ☐ Track and Field (Boys)
- ☐ Track and Field (Girls)
- ☐ Volleyball
- ☐ Wrestling
- ☐ Other:

Which of the following would you consider a performance enhancing drug?

Check all that apply

- ☐ Adrenaline
- ☐ Alcohol
- ☐ Anabolic Steroids
- ☐ Beta Agonists
- ☐ Beta Blockers
- ☐ Blood doping
- ☐ Caffeine
- ☐ Diuretics
- ☐ Gene manipulation
- ☐ Hormone Antagonists
- ☐ Human Growth Hormone (HGH)
- ☐ Marijuana
- ☐ Morphine
- ☐ Pain relief cream

- [ ] Protein supplements
- [ ] Sports Drinks
- [ ] Tobacco products
- [ ] None of the above are Performance enhancers

Should high school athletes be tested for performance enhancing drugs?

- [ ] Yes
- [ ] No
- [ ] Unsure
- [ ] Prefer not to say

Assuming performance enhancing drug testing was implemented, what level of punishment should be associated with positive tests

Select one punishment for each offense

	Warning	One game suspension	Multiple game suspension	Season suspension	Lifetime suspension
First offense	☐	☐	☐	☐	☐
Second offense	☐	☐	☐	☐	☐
Third and subsequent offenses	☐	☐	☐	☐	☐

Appendix B: Coaches Recruiting Email

High School Athletics: Coaching Opinions on Performance Enhancing Drugs

IRB # CSM1407

Dear coach,

You are invited to take part in a research study because you are currently coaching, or have coached in the last year, athletics at the high school level. The purpose of this study is to determine if differences exist between high school athletic coaches of certain demographic categories and their opinions regarding the classification, testing, and punishment associated with performance enhancing drug use by high school athletes. This research study is being conducted as part of the requirements of my Doctor of Educational Leadership degree at College of Saint Mary.

You may receive no direct benefit from participating in this study, but the information gained will be helpful determining a need for continuity in performance enhancing testing and education in high school athletics. Should you decide to participate you are being asked to participate in an on-line survey which should take no more than five minutes to complete. Your participation is strictly voluntary. Furthermore, your response, or decision not to respond, will not affect your relationship with College of Saint Mary, the researcher, or any other entity. Specifically, your responses will not be shared with or have any impact on your employment or coaching assignment. Please note that your responses will be used for research purposes only and will be strictly confidential. No one at College of Saint Mary will ever associate your individual responses with your name or email address. The information from this study may be published in journals and presented at professional meetings.

Your completion and submission of the questionnaire indicate your consent to participate in the study. You may withdraw at any time by exiting the electronic survey. This study will not cost you in any way, except the time spent completing the electronic survey. There is no compensation or known risk associated with participation.

Please read *The Rights of Research Participants* attached. If you have questions about your rights as a research participant, you may contact the College of Saint Mary Institutional Review Board, 7000 Mercy Road, Omaha, NE 68144 (402-399-2400).

Thank you sincerely for participating in this important research study. If you have comments, problems or questions about the electronic survey, please contact the researcher. To begin, please click the survey URL below:

https://docs.google.com/forms/d/12qyyL8YS8e3loe_MBw3qvevkt6XJp6Agz67C0w0zKWA/viewform?usp=send_form

Sincerely,

Joseph M. Greco Ed.D. (c)
Jgreco6436@csm.edu
College of Saint Mary

Appendix C: The Rights of Research Participants

COLLEGE OF SAINT MARY

THE RIGHTS OF RESEARCH PARTICIPANTS*

AS A RESEARCH PARTICIPANT AT COLLEGE OF SAINT MARY

YOU HAVE THE RIGHT:

1. TO BE TOLD EVERYTHING YOU NEED TO KNOW ABOUT THE RESEARCH BEFORE YOU ARE ASKED TO DECIDE WHETHER OR NOT TO TAKE PART IN THE RESEARCH STUDY. The research will be explained to you in a way that assures you understand enough to decide whether or not to take part.

2. TO FREELY DECIDE WHETHER OR NOT TO TAKE PART IN THE RESEARCH.

3. TO DECIDE NOT TO BE IN THE RESEARCH, OR TO STOP PARTICIPATING IN THE RESEARCH AT ANY TIME. This will not affect your relationship with the investigator or College of Saint Mary.

4. TO ASK QUESTIONS ABOUT THE RESEARCH AT ANY TIME. The investigator will answer your questions honestly and completely.

5. TO KNOW THAT YOUR SAFETY AND WELFARE WILL ALWAYS COME FIRST. The investigator will display the highest possible degree of skill and care throughout this research. Any risks or discomforts will be minimized as much as possible.

6. TO PRIVACY AND CONFIDENTIALITY. The investigator will treat information about you carefully and will respect your privacy.

7. TO KEEP ALL THE LEGAL RIGHTS THAT YOU HAVE NOW. You are not giving up any of your legal rights by taking part in this research study.

8. TO BE TREATED WITH DIGNITY AND RESPECT AT ALL TIMES.

THE INSTITUTIONAL REVIEW BOARD IS RESPONSIBLE FOR ASSURING THAT YOUR RIGHTS AND WELFARE ARE PROTECTED. IF YOU HAVE ANY QUESTIONS ABOUT YOUR RIGHTS, CONTACT THE INSTITUTIONAL REVIEW BOARD CHAIR AT (402) 399-2400. *ADAPTED FROM THE UNIVERSITY OF NEBRASKA MEDICAL CENTER, IRB WITH PERMISSION.