

Student-Athlete Drug Deterrence and Impact of Screening: A Quasi-Experimental Study

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Student-Athlete Drug Deterrence and Impact of Screening: A Quasi-Experimental Study

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Abstract

The purpose of this quasi-experimental study was to determine if a statistically significant difference existed in perceived effectiveness of RSDT in deterring student-athlete drug use. Determining statistical differences in perception took place among student-athletes versus non-athletes as well as athletes who participate in Randomized Student-Athlete Drug Testing (RSDT) versus those who do not. The problem was whether RSDT decreases drug use among student-athletes. The study was necessary to provide feedback for school administrators uncertain on the decision of implementing RSDT. A gap in the research was present as student body perception of RSDT was limited. The gap was filled by revealing perception of RSDT effectiveness among four participant groups. This study revealed differences between four groups of participants among independent variables (sport participation and RSDT participation). Research Questions were answered by determining if statistically significant differences in perception exist among athletes vs non-athletes, and athlete RSDT vs athlete non-RSDT participants. The dependent variable consists of survey scores for 158 freshman health class student-athletes and non-athletes. The Theory of Reasoned Action (TRA) and Theory of Planned Behavior (TPB) created a framework for the study. Data were analyzed using descriptive statistics, along with a Mann-Whitney U Test to determine if statistically significant differences existed. Statistical differences were found among athletes and non-athletes in perceived effectiveness of RSDT in deterring drug use. No statistical differences were found among athlete RSDT participants and athlete non-RSDT participants. School districts seeking to deter student-athlete drug use might benefit from this research study.

Keywords: randomized, student, athlete, drug, testing

Dedication

My dissertation is dedicated to my beautiful wife and two daughters. I have been working on this document for the better part of six years, fortunately, along the way there have been three separate degrees earned. Unfortunately, there was a price paid for the amount of time required to attain these degrees. There were enormous sacrifices on the part of my family. The time commitment is unprecedented and I can not thank them enough for their immense love and support. I love all of you.

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Chapter 1: Introduction

The consumption of illicit drugs and alcohol has seen a steady increase in the adolescent population around the world for a number of years (Levy et al., 2018). Degenhardt et al. (2016) found adolescence to be the peak time period to consume tobacco and alcohol, followed by an increased chance of illicit drug use. The Global Burden of Disease (GBD) suggested the risks associated with substance use to increase during adolescence and early adulthood (Whiteford et al., 2013). As high school students participate in extracurricular activities, there is an opportunity to engage in social activities and substance use. Vito et al. (2019) found an increase in adolescent social interaction increases the chances for adolescents to engage in alcohol or drug use, even binge drinking. Some researchers have found student-athletes to be at higher risk for substance use (Kwan et al., 2014; Lisha & Sussman, 2010; Veliz et al., 2015). A student-athletes increased chance to partake in drug or alcohol use presents reasoning to conduct the study. This chapter provided the need for the study, the problem the study addresses, and the overall purpose for conducting the research.

As an adolescent begins to participate in athletic competition, there is always a possibility for teammates to influence decision making. Kwan et al. (2014) found high school athletes to be more likely to engage in alcohol use when compared to students not participating in athletics. The pressure to fit in may also be a reason to succumb to peer pressure. A conforming perspective or personality from a student-athlete was found to be the primary reasoning behind the increased likelihood to participate in substance abuse (Kwan et al., 2014; Lane & DeCamp, 2017). Additionally, Veliz et al. (2015) found students are at high risk for initiating substance use at early ages if involved in athletics. Although not a requirement among school districts, a

method to reduce the chances of student-athlete substance use is to implement drug testing (DuPont & Graves, 2005).

A significant amount of research has been produced to determine if drug testing has the ability to deter student-athlete drug use (Goldberg et al., 2007; Kwan et al., 2014; Ludkte, 2011; Plotnikoff et al., 2019; Stockings et al., 2016). The literature review revealed mixed results between drug testing and its ability to eliminate substance abuse, which is near impossible. The majority of studies did conclude drug testing was a useful tool to deter student-athlete drug use. Due to a school district's uncertainty in implementing Randomized Student-Athlete Drug Testing (RSDT), this study was created to offer statistical evidence to assist a district in making a decision.

Within the district in which the study took place, the Federal Educational Rights and Privacy Act (FERPA) allows parents and student-athletes the right to view personal drug testing results with proper signatures upon request (Palley, 2017). Previous research found students experiencing drug testing to have mixed feelings toward the ability of RSDT to decrease drug and alcohol use (Russell et al., 2005; DuPont et al., 2013a). As part of this current research study, a drug-screening administrator for the target school district was interviewed. The administrator was a representative for SportSafe, Inc. and revealed data showing inconsistent results in deterring drug use within the district since the inception of Randomized Student-Athlete Drug Testing (RSDT) in 1999. The contrasting results within the literature create difficulty for a school district contemplating the implementation of drug testing to determine the correct course of action. More research is needed to determine if drug testing has the ability to deter drug use (Bahrke, 2015; Buchan et al., 2002; Glass et al., 2015).

This study focused on testing for statistically significant differences in participants' perception of RSDT effectiveness in deterring student-athlete drug use, thus contributing to the body of knowledge. Finding statistical significance was accomplished by gathering and analyzing student-athlete and non-athlete survey responses about the ability of RSDT to deter student-athlete drug use. The study examined student body statistical differences in perception of RSDT effectiveness in deterring student-athlete drug use.

The introduction to this quasi-experimental study focused on exploring and revealing the statistical difference in a student-body's perception of RSDT effectiveness in deterring drug use. Additionally, student-athlete survey responses were analyzed to determine if differences exists between athletes who have been drug tested through RSDT and athletes who have not been drug tested through RSDT. The Background and Statement of the Problem defines the context, along with stating how the study may contribute to the body of knowledge. The purpose and significance highlight how the study may advance established research and assist in solving the problem. Each section contributed to the study's content and preview's related themes in accordance with the literature review.

Background of the Problem

Previous research found student-athletes to be at a higher risk for alcohol and drug use than non-athletes, supporting implementation of RSDT (Kwan et al., 2014; Lisha & Sussman, 2010; Veliz et al., 2015). Some school districts where drug testing has been implemented have shown a tendency to decrease illicit drug use among student-athletes (Kwan et al., 2014; Sznitman et al., 2012). Additional school districts have revealed some success in decreasing recreational drug use, but still no evidence of eliminating drug use altogether (Ludkte, 2011; Plotnikoff et al., 2019; Stockings et al., 2016). Although research has revealed more success with

RSDT implementation, a lack of uncertainty with success may cause school districts to choose not to proceed with drug testing.

According to Terry-McElrath et al. (2013), from 1998-2011 only 28% of high school students had experienced any form of drug testing within a school district. As the Supreme Court enacted randomized drug testing for all students in 1995, along with suspicion-less testing for all student-athletes in 2002 (Schug, 2018), the majority of districts have not implemented RSDT (Conlon, 2003; Schug, 2018). The Supreme Court created the opportunity for any district to implement RSDT (Schug, 2018). Implementation is not mandatory, but if enacted, the regulations and frequency of testing are regulated by the school district (Jordan, 2019). Levy et al. (2018) recently demonstrated research of adolescent drug use to be on the rise and a large majority of districts still have not implemented. The majority of school districts not engaging in RSDT also show increased drug use among student-athletes (Conlon, 2003; Schug, 2018; Terry-McElrath et al., 2013).

A variety of factors can be attributed to a district choosing not to engage in drug testing programs, one of which includes cost. According to Yamaguchi et al. (2003), the early 2000s saw drug testing prices range from \$50 to \$200 per test depending on accuracy and number of drugs tested. Today, the approximate cost ranges between \$15 and \$35 per test at the most basic level of testing, but testing does not typically include testing for alcohol (Taylor, 2018). Taylor (2018) also found some states to have reported spending over \$100,000 to apply detailed testing to 500 student-athletes.

As a school district administrator contemplates a decision to implement drug testing, previous literature revealing uncertainty in overall results may add to the resistance from parents, student-athletes, school district administrators, and tax payers. Along with a focus on previous

drug testing results, researchers conducted a variety of studies centered on the legal aspects of conducting a drug test (Belsky, 2002; Lindholm, 2013; Sznitman & Romer, 2014). Strategies and procedures utilized to maintain proper testing protocol (Hoyt et al., 1987; Lin et al., 2018; Ragab et al., 2017), student, parent, and stakeholder attitudes (Andreas et al., 2016; Elliott et al., 2018; Erickson et al., 2017), arguments opposing drug testing (Bruneau et al., 2018; Coker et al., 2018), and drug testing vs. drug prevention education (Patrick et al., 2016; Rosenbaum, 2016; Vadrucchi et al., 2016) are all important aspects of this study. According to Elliott et al. (2018) elements such as cost, how testing is conducted, and community acceptance of RSDT produced inconsistent results in terms of RSDT deterring student-athlete drug use when any one of the elements are in question. Sznitman and Romer (2014) found community members to voice concerns if testing protocol such as a lack of randomization in choosing participants is in question. This study was relevant as each category has produced uncertain results in attempting to decrease student-athlete drug use.

A variety of studies have revealed a correlation between drug testing and deterring drug use. The majority of those results consisted of decreasing drug use, but others revealed RSDT having no effect on drug use. For example, Sznitman et al. (2012) found drug testing to significantly decrease drug use as a decline was seen in a large majority of participants. On the other hand, Stockings et al. (2016) found drug testing to have a limited effect on alcohol use and no effect on marijuana or illicit drug use. Pressure to conform to the activities of teammates outside of sport was concluded as reasoning for why results were different than what was expected (Stockings et al., 2016). Whether results supported a decrease in drug use or not, the common element is whether a school district is fully invested in implementation of the testing

program. If school district officials feel a duty to try and decrease student drug use, RSDT is an option.

Statement of the Problem

The problem was whether RSDT decreases drug use among student-athletes. This study was necessary as student body perception of RSDT effectiveness in deterring student-athlete drug use provided additional feedback for school administrators uncertain on the decision of implementing into a district. Research revealed student-athletes to be at higher risk for substance use (Kwan et al., 2014; Lisha & Sussman, 2010; Veliz et al., 2015), which may influence school district administration to make decisions about implementing drug testing. RSDT has the capability to help those students who use drugs to stop for the benefit of the sport (Plotnikoff et al., 2019). The literature review previewed research studies focusing on diverse populations within a variety of settings. As the majority of the studies found RSDT to decrease drug use, none were able to convincingly determine drug testing as a formidable system to eliminate drug use.

Some of the research studies examining RSDT as a drug use deterrent concluded more statistical data is needed to confidently endorse (Bahrke, 2015; Buchan et al., 2002). Statistical evidence was also inconsistent for alcohol, illicit drug use, and prescription medications (Ludkte, 2011; Plotnikoff et al., 2019). Most research concluded drug testing as a useful deterrent for drug use, but it was difficult to determine if RSDT was effective enough to eliminate the problem. Additional studies in the literature review taper the focus toward how RSDT produced overwhelming results in deterring drug use, which would argue the problem was virtually eliminated in these school districts (Kwan et al., 2014; Sznitman et al., 2012). Findings from these studies may provide valuable information for school district administration when

considering RSDT as a method to decrease student-athlete drug use. As a result of uncertainty and inconsistency in previous research, the proposed study was important to conduct.

The goal was to add to the body of knowledge of what is known about a student-athlete's risk for drug use. Adding new information to the literature regarding sport participation was accomplished by determining if there was a statistical difference in student body perception of RSDT effectiveness in deterring student-athlete drug use. Because of this elevated risk for drug use, the study creates reasoning for school districts to consider RSDT implementation after athlete and non-athlete survey results are revealed.

During the RSDT decision-making process, school administration must weigh the potential for RSDT to decrease drug use with how the RSDT process was accepted by a community. Enacting RSDT may negatively alter the attitude of the student body, and if no progress is seen, the community as a whole may be disenchanted with the program. Drug testing can also be positively portrayed by a community as Gibson et al. (2019) found RSDT to produce a feeling of fairness in the testing process from students and community members.

School district administrators must weigh multiple factors when considering implementation. Evaluating community response, along with how successful administration perceives RSDT effectiveness in decreasing drug use is essential when making decisions. A gap in the literature was found due to inconsistency in decreasing drug use. The majority of past studies found RSDT to deter drug use, but a lack of consistency in decreasing drug use left uncertainty in determining if drug testing deters drug use (Ludkte, 2011; Plotnikoff et al., 2019; Stockings et al., 2016). As the problem of student-athlete drug use has not been resolved, this study adds to the established research by determining if student body responses estimate

substance use among student-athletes to be declining due to the presence of RSDT. The data revealed can potentially impact reasoning for school districts to invest in RSDT implementation.

Purpose of the Study

The purpose of this quasi-experimental study was to determine if a statistically significant difference existed in perceived effectiveness of RSDT in deterring student-athlete drug use.

Determining statistical differences in perception took place among student-athletes versus non-athletes as well as athletes who participate in Randomized Student-Athlete Drug Testing (RSDT) versus those who do not. Student-athlete and non-athlete survey responses toward the ability of RSDT to deter student-athlete drug use were examined. Recreational drug use can become a barrier for a student-athlete's overall success in the classroom or on the athletic field. RSDT can be a remedy to decrease drug use among these student-athletes (Goldberg et al., 2007; Kwan et al., 2014; Madras et al., 2009; Pesce et al., 2011). Results from this quasi-experimental study may inform school district administration decisions to implement RSDT. The rationale for research, methodology, connection to a theoretical framework, and relevant populations in relation to how the research fills a gap in subject knowledge was identified.

This quantitative study used a quasi-experimental design to assist in deciphering student body survey responses to determine any differences in perception toward the ability of RSDT to deter student-athlete drug use. Along with contributing to the established body of knowledge, the study may assist in school district administrators' decision to implement RSDT. Two-hundred thirty students were given a Likert-scale survey to determine if student-athletes felt RSDT would decrease drug use. A Likert-scale (1-Strongly Disagree; 10-Strongly Agree) was utilized to assist students in evaluating each question to determine if RSDT effects drug use. The survey was created to produce an opportunity for students to reveal insight into how personal experience

with one variable can alter behavior and effect the other variable (Mertler, 1999). Establishing a difference between student body responses and the effectiveness of RSDT on drug use was an appropriate research strategy due to enabling goals to be fulfilled and each research question to be answered (Becker et al., 2016; Chua et al., 2018; Lau, 2017).

There are two independent variables for the study. The first was sport participation and whether or not a student taking the survey was an athlete or non-athlete. The next independent variable is whether each student-athlete has been drug tested and experienced the entire RSDT process or not. The dependent variable was the total composite score of each student taking the survey and was a continuous variable. A quasi-experimental research approach was appropriate as Bärnighausen et al. (2017) found the method to enhance and improve evidence for casual subjects.

According to recent data, the student body at the target school district in Central Ohio is part of 30% of school districts using RSDT (Plotnikoff et al., 2019; Terry-McElrath et al., 2013). The data retrieved from this study may be shared with school district administration across the country. The results will aid in the administrative decision-making process for RSDT implementation. RSDT protocol has the ability to deter student-athlete drug use, which facilitates maximal opportunities to succeed in the classroom and on the playing field (Goldberg et al., 2007; Kwan et al., 2014; Madras et al., 2009; Sznitman et al., 2012). Whether previous RSDT studies reveal an increase, decrease, or no change in student-athlete drug use, the common theme among researchers suggests more research is needed (Bahrke, 2015; Ludkte, 2011; Plotnikoff et al., 2019; Stockings et al., 2016).

Research studies focused on student-body perceptions regarding the ability of RSDT to deter drug use were centered solely on student-athletes (Cornell & Huang, 2016; DuPont et al.,

2013a; Russell et al., 2005). This study intends to fill a gap in research by comparing survey responses about RSDT effectiveness among student-athletes and non-athletes. This approach reveals a difference between each variable and has not been attempted using a quasi-experimental method and adds to already established research. Additionally, the study compared perception of RSDT effectiveness between student-athletes who have been drug tested through RSDT and student-athletes who have not been drug tested. The results revealed if each of the four group's mean composite scores show a statistically significant difference in perceived effectiveness of RSDT. Results will serve as guidance when school district administrators consider RSDT implementation.

Significance of the Study

The significance of this study has the ability to inform a school district's decision to implement RSDT, which may decrease student-athlete drug use. Previous research has produced mixed results, but the majority of studies have shown a decrease in drug use for student-athletes or more research needed to conclude findings. The results of the study may impact a school district's decision by analyzing student body responses toward the ability of RSDT to decrease student-athlete drug use. Previous research has been extensively explored and produced mixed results in RSDT deterring student-athlete drug use, but the majority revealed a decrease in overall drug use (Bahrke, 2015; Goldberg et al., 2007; Kwan et al., 2014; Ludkte, 2011; Madras et al., 2009; Plotnikoff et al., 2019; Stockings et al., 2016; Sznitman et al., 2012).

Some research revealing student responses focused on data from student-athletes only (Cornell & Huang, 2016; DuPont et al., 2013a; Russell et al., 2005). These findings concluded students' feelings toward RSDT decreased student-athlete drug use as well. This research study was intended to fill a gap in the research which includes no results showing a combination of

athletes, non-athletes, drug tested athletes, and non-drug tested athletes' perception of RSDT effectiveness in decreasing drug use. School district administration and leaders may use this information when considering RSDT as a method to deter drug use while in high school. The decrease in drug use may accelerate student body academic and extracurricular achievement.

There are additional interventions a school district may implement in an attempt to decrease drug use among high school students. Stakeholder and tax payer acceptance of RSDT can be a factor in a district's decision to implement (Newton et al., 2016; Patrick et al., 2016; Rosenbaum, 2016). Agabio et al. (2015) suggested another proactive method to deter drug use in comparison to RSDT, Drug Prevention Education (DPE). A district teaching staff must alter academic schedules, find time for training, and place emphasis on DPE to implement in a school (Medeiros et al., 2016). Agabio et al. (2015) conducted a systematic search for 50 DPE programs to find teacher dedication to the cause to be low and over half of the programs showed no effect on drug use.

This study offers guidance for school district leadership when considering methods to deter student drug use, which can facilitate a maximal academic and athletic experience. The survey results may help a district to know what to expect from the RSDT process before implementing. According to Rathbun (2011), if reasoning behind RSDT implementation is focused on facilitating each student's success, the likelihood of student and community acceptance will increase. Hadland and Levy (2016) also warned to expect community and student resistance, which can be troublesome to implementation. The significance of this study focuses on helping a district decide whether to implement RSDT or not. The research questions highlight how a student body perceives RSDT to deter student-athlete drug use.

Research Questions

The study's research questions were based on a theoretical framework where RSDT decreases student-athlete drug use. Each question reflected the study's purpose and problem. The following research questions for the quantitative study were as follows:

Research Question One. Is there a statistically significant difference between sport participation (athletes vs. non-athletes) in RSDT perception in deterring drug use?

Research Question Two. Is there a statistically significant difference between drug testing participation (those athletes who've had RSDT vs. those athletes who have not) in RSDT perception in deterring drug use?

Hypotheses

The hypotheses for each research question provide the possible outcomes when the survey scores are examined. Each hypothesis compared the survey scores for athletes, non-athletes, drug tested athletes, and non-drug tested athletes. The data collection instruments highlighted helped to assist in answering each research question and delivering hypotheses.

RQ 1, H1o: Sport participation does not reveal a statistically significant difference in perception between athletes and non-athletes.

RQ 1, H1a: Sport participation reveals a statistically significant difference in perception between athletes and non-athletes.

RQ 2, H1o: Drug testing participation does not reveal a statistically significant difference in perception between athletes who have had RSDT and athletes who have not.

RQ 2, H1a: Drug testing participation does reveal a statistically significant difference in perception between athletes who have had RSDT and athletes who have not.

Theoretical Framework

This section previewed the study's theoretical framework, which revealed how data were interpreted, which enhances reliability and validity (Straughair, 2019). This study was informed by two separate but similar theories, the Theory of Reasoned Action (TRA) and the Theory of Planned Behavior (TPB) (Cooke et al., 2016; Tuck & Riley, 2017; Yzer, 2017). TRA focuses on behavioral intention in comparison to the specific behavior being enacted (Montano & Kasprzyk, 2015). According to Ajzen (2015), TRA's originator, the theory was derived from social constructs to determine the intention of an individual's choices. TRA generates an opportunity to predict student-athlete behaviors by analyzing beliefs and attitudes (Tuck & Riley, 2017). These theories address a student-athlete's reasoning to engage in drug use, while the study revealed student body perception of RSDT effectiveness in decreasing drug use. A student-athlete's attitude toward drug use manifests why a person may choose to engage in the act of substance use, which was reason to conduct the study.

According to Yzer (2017), TPB was specifically developed to assist in rationale why one engages in certain health behaviors. Generating understanding why a student-athlete engages in drug use is accomplished through a combination of TRA and TPB, which provided the frame for the study. The study's research questions and hypotheses center on a theoretical framework where student body participation in athletics and being drug tested through RSDT are the independent variables upon which individual survey composite scores was the dependent entity. The framework facilitates reasoning why and how RSDT influences student-athlete drug use.

A student-athlete's intention to engage in unhealthy behaviors is centered on attitude toward a subject (Cooke et al., 2016). There is a possibility of determining the intention, along with potentially altering the perception and attitude of student-athletes who experience RSDT

(Cooke et al., 2016). The survey given to a student body at the testing site provided feedback for how the subjects perceived RSDT effectiveness in deterring drug use. School district administration understanding of student-athlete reasoning to engage in drug use produces an opportunity to determine the impact of RSDT before a decision is made to implement. The literature review provides further evidence of RSDT's relationship with drug use, including how the elements of TRA and TPB relate to a student-athlete's attitude, norms, and behaviors.

Definitions of Terms

The definitions provided are centered on the study's independent and dependent variables. All terms serve as a guide while following the research study. Each term was related to the process of drug testing and the ability to deter student-athlete drug use.

Administrator. The term “administrator” can have multiple meanings throughout the study. If the administrator defined is directly involved in education, the terms of “educational administrator” or “athletic administrator” is clearly stated. Additionally, SportSafe Inc. (1999) provides “drug testing administrators” which are defined as “administrators” within the context, or “RSDT administrators.” This term was represented in the literature review while focusing on previous RSDT studies (Goldberg et al., 2007; Guzman & Pohlmeier, 2014; Kwan et al., 2014; Sznitman et al., 2012), along with the Methodology section and the details surrounding this study.

Educator. The term “educator” was represented multiple times while referencing teachers and coaches. This term was utilized while educators assist in the execution of archived RSDT data on the testing site. Additionally, an educator administered the “student-athlete survey” to gather data to answer one of the research questions (Sznitman et al., 2012).

Randomized Student-Athlete Drug Testing (RSDT). Independent variable. A method to measure student-athlete substance use while participating in athletics. The Supreme Court legalized this method in 1995 allowing districts to implement this drug deterrence method (Schug, 2018). RSDT was represented throughout the study for archived results from the literature review and conduction of the survey given to current students at the study site.

Student-Athlete Drug Use. Any student-athlete engaging in drug use falls under this term which was highlighted consistently through each chapter during this study. Student-athlete drug use was represented throughout the study within the theoretical framework. Drug use among student-athletes frames the study as a combination of TRA and TPB to provide potential reasoning for why student-athletes engage in drug use (Yzer, 2017).

Student-Body Survey. A measurement of student-athlete and non-athlete's perception of the RSDT process and the ability of RSDT to deter drug use. The student body survey was represented as an instrument for this study to assist in answering each research question (Lau, 2017). The survey not only measures the perceptions regarding RSDT, but student-athlete and non-athlete perception of drug and alcohol use inside the district which RSDT has been implemented (Appendix A).

Assumptions

Assumptions within research studies are considered to be valid, but each technically is not scientifically tested (Wolgemuth et al., 2017). All assumptions are focused on the purpose of the study, which examines differences in student body perception of RSDT effectiveness in deterring student-athlete drug use. The study revealed student body survey responses toward the ability of RSDT to deter drug use. RSDT takes place inside the targeted high school, so testing procedures are assumed to be conducted by qualified individuals whom provide an unbiased and

fair analysis of each student-athlete's drug test. As the study revolves around a survey, an assumption was all participants were enrolled in Health courses before engaging in the survey. The survey questions were also assumed to be appropriate forms of assessment to evaluate student-athlete perception toward RSDT effectiveness (Hess, 2010). This assumption was necessary as there was only one single previous study providing similar questions to satisfy the validity and reliability of the survey. All participants were assumed to be honest and would perform to the best of ability when filling out the survey.

Scope and Delimitations

This section highlights the specifics of this research study with respect to defining the elements of scope and delimitations. Scope is defined as the extent to which RSDT and student-athlete drug use are explored, along with the parameters in which the study operates (Theofanidis & Fountouki, 2018). The scope for this study focused on analyzing student survey results to examine and identify a difference in student body perception of RSDT effectiveness in deterring student-athlete drug use. A survey was conducted and solicited a student body's responses toward the ability of RSDT to deter drug use.

The scope of the study limits the generalizability of the findings to other school districts outside of the original district being studied. The scope assisted in attaining the goal of establishing a significant difference among student body (non-athlete and athlete) survey responses. Survey responses were analyzed to establish differences among groups in perception of RSDT's effectiveness in deterring drug use.

The delimitations are defined as characteristics which limit the scope through a description of potential boundaries (Theofanidis & Fountouki, 2018). These specific elements of the study were chosen to answer proposed research questions. The first delimitation focused on

selecting only one target high school within a large district in Central Ohio. This delimitation was selected as there was a limited number of districts utilizing drug testing in the Central Ohio area, and the person responsible for distributing the survey is an employee within the district. The next delimitation centered on the 230 potential participants for the survey, which are all freshman Health class students inside the target high school. This delimitation was chosen as Health courses are typically containing only one grade level. Statistical data may yield different results in another district engaging in RSDT.

Limitations

This section highlighted and described the study's limitations. These issues are a concern and are considered uncontrollable (Hess & Abd-Elseyed, 2019). This study gathered student-athlete responses by utilizing a paper-based survey. The survey asked students to respond to questions related to the ability of RSDT to effectively deter drug use. The target school was chosen as there is a limited number of Central Ohio districts utilizing RSDT. The survey was limited to 230 participants in a Health class. Two-hundred thirty students is the number for one semester of students in a Health course for a high school enrollment of 2000 and a student-athlete base of over 1300.

The survey may make some students uncomfortable due to the nature of the questions, which may inhibit some from completing. Using a paper-based survey for responses may be a limitation in students answering all questions honestly in comparison to a web-based method. Although, Greenlaw and Brown-Welty (2009) found paper-based surveys to be more reliable and accelerate response rates. The expectation was for the survey to be completed in under five minutes, placing a time limit could hinder each participant's ability to thoroughly read and answer each question. Steps to control limitations centered on the survey instrument focused on

mirroring previous research studies using a survey to assess student responses (DuPont et al., 2013b; Hess, 2010; Russell et al., 2005).

Generalizability may also be limited as a specific population in one school district is the group participating. According to Murad et al. (2018), supporting evidence and applicability are the key determinants in the creating confidence for others to replicate the study. If applicability is low, certainty in the overall results will also be low (Murad et al., 2018). Additionally, causality cannot be inferred when using a quasi-experimental design. The causal effects of participating in athletics and having been drug tested cannot be inferred from the data. According to Kim and Steiner (2016), the reasoning is due to the potential outcomes never being observed simultaneously.

Another limitation involved the potential for self-reporting bias. Confounding variables may also not be controlled throughout the study. A student being drug tested multiple times can be considered a confounding variable, which is not controllable. Student body perception of RSDT effectiveness may be different in those who have been drug tested more times than others. Recognition of this confounding variable increases internal validity of the study (Teschke & Danan, 2018). The survey questions were developed based on an instrument used in a past research study (Hess, 2010). Hess' (2010) instrument was not validated and was considered a limitation. After survey results were gathered, data were compared to Hess' survey results to increase validity.

Chapter Summary

Chapter one delivered an introduction and overview of the study. The purpose of this quasi-experimental study was to determine if a statistically significant difference existed in perceived effectiveness of RSDT in deterring student-athlete drug use. Determining statistical

differences in perception took place among student-athletes versus non-athletes as well as athletes who participate in Randomized Student-Athlete Drug Testing (RSDT) versus those who do not. This measurement was accomplished by examining and analyzing student body responses toward the ability of RSDT to deter drug use by administering a paper-based survey to current student-athletes and non-athletes. The problem was whether RSDT decreases drug use among student-athletes.

This chapter introduced the study's research questions and hypotheses, theoretical framework which frames each of the research questions, and the methodology used to address each one. Additionally, a summary of the study's definitions, assumptions, scope, delimitations, and limitations were introduced. The significance of the study was addressed, which revealed how the study contributes to existing research related to the ability of RSDT to deter student-athlete drug use. The background guiding the study was previewed and was highlighted further in the literature review.

The literature review delivers a thorough and succinct review of the literature related to previous RSDT studies. The reviewed research focuses a variety of school districts with a multitude of variables related to RSDT. The chapter highlights the legality and procedural implications of RSDT, and student, parent, and community response to RSDT protocol.

Chapter 2: Literature Review

The purpose of this quasi-experimental study was to determine if a statistically significant difference existed in perceived effectiveness of RSDT in deterring student-athlete drug use. Determining statistical differences in perception took place among student-athletes versus non-athletes as well as athletes who participate in Randomized Student-Athlete Drug Testing (RSDT) versus those who do not. Past research revealed the majority of studies identifying RSDT as a deterrent for student-athlete drug use (Bahrke, 2015; Plotnikoff et al., 2019; Stockings et al., 2016; Sznitman et al., 2012). Some research was inconsistent and lacks specific evidence related to solving the problem of athletic participants partaking in drug use (James-Burdumy et al., 2012; Yamaguchi et al., 2003). The problem was whether RSDT decreases drug use among student-athletes.

The literature review encompasses the specifics related to each of the research questions. If a school district is going to make an investment in RSDT, the research may need to reveal significant proof of a decrease in drug use. A one-year study focused on illicit drug use found a reduction among the student body due to RSDT (James-Burdumy et al., 2012). Comparatively, Yamaguchi et al. (2003) conducted a longitudinal study focused on student-athletes vs. non-athletes. The results revealed a lack of evidence in proving RSDT decreases drug use for either group (Yamaguchi et al., 2003). The literature review provided research supporting what is known and unknown about RSDT. The research questions focused on establishing a statistically significant difference among student-athletes and non-athletes through a survey centered on perceived effectiveness of RSDT on drug use. Previous research conveying student body response toward the ability of RSDT to deter drug use was also revealed.

The first section was a comparative analysis focused on previous RSDT results from school districts which implemented these programs. The research centered on RSDT procedures which had little or no effect on drug use, along with those decreasing student-athlete drug use. The following section provides significant research regarding the legal aspects of executing a drug test. Moving forward, strategies and procedures while conducting RSDT were introduced. An investigation into student-athlete, parent, and stakeholder attitudes toward RSDT was highlighted. Additionally, specific arguments opposing RSDT were considered. Finally, a comparison of RSDT vs. Drug Prevention Education (DPE) programs was explored.

Literature Search Strategy

The literature search strategy was centered on two separate subjects: reviewing results from previous RSDT studies and gathering attitudes focused on RSDT procedures, legality, and opposing aspects. Most research was conducted while utilizing the library database provided through the American College of Education, along with access to the online database with Fort Hays State University. The majority of the scholarly literature was acquired from four separate sources, Google Scholar, BioMed Central, EBSCO Discovery, and PubMed. When the abstract was only available, the author was contacted to obtain the full text. Additional online sources focused on Supreme Court cases were obtained from the U.S. Government Publishing Office. The following key words and phrases were used to search the literature: RSDT, student-athlete drug use, student body feelings toward drug use, educational administration feelings toward drug use, student perceptions of RSDT, community perceptions toward drug use, parent perceptions toward drug use, student-athlete illicit drug use, student-athlete alcohol use, student non-athlete illicit drug use, student non-athlete alcohol use, student non-athlete drug use perceptions, supreme court drug testing rulings, legal aspects of RSDT, and arguments opposing RSDT.

Theoretical Framework

This study was informed by two theories, the Theory of Reasoned Action (TRA) and the Theory of Planned Behavior (TPB). According to Montano and Kasprzyk (2015), the Theory of Reasoned Action (TRA) centers on behavioral intention in comparison to the actual behavior being performed. TRA is an upgrade to information integration theory, which solely attempts to predict one's behavior. TRA originates from the attitude and social construct theories to determine the intention of one's choices (Hagger, 2019). Additionally, the theory begins with the ability to predict human behaviors by using the concepts of beliefs, attitudes, and intentions (Tuck & Riley, 2017). TRA was developed by Martin Fishbein and Icek Ajzen in the 1970s as a method to upgrade theory in predicting behaviors (Ajzen, 2015). According to Fishbein and Ajzen, one's focus in making decisions is surrounded by two elements: personal attitude and norms based on society (Hagger, 2019).

TPB originally began as TRA in 1980, but was added as an extension to provide reasoning for why one engages in specific health behaviors (Yzer, 2017). According to Ajzen (2015), the originator of TPB, behavioral intention generates not only from specific beliefs, but also one's required skills and when situational factors do not overtake behavioral performance. Ajzen (2015) felt establishing control over behavior is comprised of six specific areas, attitudes, behavioral intention, subjective norms, social norms, perceived power, and perceived behavioral control. When a student-athlete engages in drug use, these six areas can have an impact on reasoning why one exhibits those behaviors. Kristiansen (2017) concluded some student-athletes in pursuit of equal distribution between academics and athletics find this balance stressful and are more susceptible to use drugs. Additionally, Blustein (2017) found heavy drinking to be a remedy for some student-athletes when considering personal popularity. As student-athletes

continue to engage in drug use more often than non-athletic participants, understanding why through TRA and TPB provide the framework for this study.

As behavioral intention toward drug use begins to manifest, students are working with two elements: attitudes and norms (Montano & Kasprzyk, 2015). A student-athlete's attitude toward drug use is a motivating factor as to why one might engage in drug use. TRA and TPB rely on the assumption of the greatest predictor of behavior being intention (Kautonen et al., 2015). The idea of normative and planned behavior, and how society would want one to act, influences decision-making. The theoretical framework was centered on the ability of TRA and TPB to predict health behavior related to substance use. Each theory supports reasoning as to why a student-athlete may engage in drug use. Due to the theoretical framework revealing student-athletes being at high risk, RSDT may be a solution to deter drug use. The problem was whether RSDT decreases drug use among student-athletes.

A combination of TRA and TPB allows one the ability to predict the intention of the student-athlete before each engages in drug use. According to Ajzen (2012), the combination of attitude, perceived behavior control, and subjective norms can be utilized to figure out intention of student-athletes. The study embarked upon data results as RSDT is used as an environmental element to sway student-athlete intention to partake in drug use. According to Cooke et al. (2016), adolescent intentions had the greatest relationship with attitude, followed by norms, and finally with behavior control in terms of a decision to use drugs. There is a possibility to determine and potentially alter the intention and even motivation of student-athletes who undergo RSDT.

Zemore and Ajzen (2014) found decision-making to be an important element of TPB, which is the strongest in adolescent females and adults in general. Individual intentions were

found to be the only consistent element with regard to prediction of behaviors (Zemore & Ajzen, 2014). Additionally, the study revealed when one participates in substance use, this action will serve as a predictor of individual decisions and behaviors. In adolescent drug use, Hagger et al. (2018) found TRA specifically to be a determinant in predicting future health behaviors. Prior to RSDT implementation, understanding one's behavioral intention, or reason for engaging in drug use can assist in determining the impact of randomized drug testing. If a district chooses to enact the RSDT process, knowledge of TRA and TPB capabilities may provide knowledge related to student-athletes reasoning for engaging or not engaging in drug use.

Research Literature Review

RSDT has been a part of the student-athlete experience in this study's target school district since the fall of 1999. SportSafe Incorporated was the governing entity responsible for testing each student-athlete and obtaining results. A statistical analysis was then given to athletic and academic administration so student-athletes and parents can be contacted. After interviewing one of SportSafe's drug testing administrators, the drug testing data showed inconsistency in preventing drug use among student-athletes.

Previous RSDT Studies

According to Dunn et al. (2012), student-athletes are more likely to engage in drug use than students not participating in athletics. In fact, Herring et al. (2016) found students participating on sports teams more likely to engage in binge drinking of alcohol. The previous RSDT studies have the power to attract attention from school districts as eliminating student-athlete drug use is a concern. Conlon (2003) found larger school districts to be more apt to implement RSDT in comparison to troubled schools. As districts find implementing RSDT an important method to decrease student-athlete drug use, understanding how drug testing became

available for implementation is essential. In 1995, the U.S. Supreme Court upheld the legality of randomized drug testing in the case of the *Veronia School District vs. Acton* case (Levy et al., 2015). This action led to the establishment of randomized drug testing for all schools in the U.S. Even after the allowance of RSDT in schools several years ago, evaluating efficacy and potential risks of implementation is still in question (Levy et al., 2015).

A concern of school district administration is with RSDT being a cost-effective method to eliminate drug use. This study attempted to discover how a student body perceives RSDT to deter drug use. Even if survey data were to show RSDT to decrease drug use, cost would still be a budget issue for a school district. According to DuPont and Graves (2005), districts placing limitations on how many substances will be tested during the RSDT process is common. As a district contemplates the purchase of urinalysis testing, utilizing a panel which focuses on detection of five specific substances is typical (DuPont & Graves, 2005). As costs of implementation are concerning for administration, the ability to maintain an RSDT program is another concern. According to Ellickson et al. (1997), RSDT implementation and maintenance open students to research studies and surveys which school administrators believe to create overexposure. Student body perceived effectiveness of RSDT in deterring student-athlete drug use will assist in a district administrative decision to implement drug testing.

When evaluating the value of RSDT in schools, a district may need to commit to many years of drug testing to establish a trend of success or failure. Kushnir et al. (2018) found a minimum of five years for a follow-up trial appropriate to gauge effectiveness. Results showed decreases in use after six months, but determined a five-year follow-up participant survey was needed to ensure statistical significance (Kushnir et al., 2018). In contrast, Stockings et al. (2016) found RSDT to produce very little effect on a student-athletes' drug use. Exploring previous

drug testing research in various school districts has the ability to show a correlation between RSDT and drug use. Researching RSDT studies produces understanding and an opportunity to compare previous drug testing trends with this study's data.

RSDT Results—No Effect on Drug Use

Some studies revealed mixed results in RSDT decreasing student drug and alcohol use. Plotnikoff et al. (2019) compiled several studies during a meta-analysis, each met preliminary criteria with respect for testing students for drug and alcohol use. Results found alcohol-related activities decreased, but drug use findings were inconsistent and not able to show a decline in usage (Plotnikoff et al., 2019). Ludkte (2011) conducted a study focused specifically on drug use at a Midwest collegiate institution which implemented RSDT for a two-year span. RSDT seemed to increase overall student-athlete drug use after initiation, along with a decrease in attitude toward acceptance of drug testing (Ludkte, 2011). According to Guzman and Pohlmeier (2014), when RSDT is utilized, the goal is to eliminate the potential for at risk behaviors, which includes drug use. The intention is for student-athletes to not only stop use while participating in athletics, but continue to make responsible choices after high school (Guzman & Pohlmeier, 2014). Stockings et al. (2016) conducted a systematic review using alcohol, marijuana, and other illicit drugs involving snorting, smoking, and injecting. Results concluded RSDT had limited effect on deterring alcohol use, and virtually no effect in limiting marijuana and other illicit drug use.

Intervention methods after use, along with educational based skills training, had better success than RSDT (Stockings et al., 2016). Vermeulen-Smit et al. (2015a) conducted a meta-analysis with a focus on marijuana and illicit drug use specifically. The results concluded a very limited decrease in marijuana use among adolescents, along with an increase in illicit drug use while engaging in RSDT (Vermeulen-Smit et al., 2015a). Even a combination of RSDT and

family interventions were not enough to decrease illicit drug use. Additionally, Peretti-Watel et al. (2019) tracked repeated marijuana use for 419 students, which found one-third of participants repeating use over a three-year span. Results did find the majority of those students being tested stopped drug use while attending high school, most of the repeated use was after high school ended. Mixed, uncertain, and ineffective RSDT results can create uncertainty among school districts investing in implementation (Peretti-Watel et al., 2019).

RSDT Results–Decreasing Drug Use

Goldberg et al. (2007) felt understanding the level of value RSDT brings to a school and its student-athletes is unknown. Drug testing implementation may take time to evaluate how the effectiveness of RSDT on drug use will trend. Student-athletes experiencing RSDT for a two-year span were compared to schools without drug testing (Goldberg et al., 2007). At the end of the trial, the RSDT student-athletes reported significantly less drug and alcohol use. Moreover, Kwan et al. (2014) found more than 80% of participants exhibited a decrease in illicit drug use. Another factor with the power to alter RSDT results relates to the climate in which student-athletes reside. Sznitman et al. (2012) felt RSDT effectiveness depends on the perceptions of each student in terms of school district and home existence. A sample of 943 adolescents were studied, student-athletes were found to experience lower levels of drug use in a positive climate in comparison to a negative climate (Sznitman et al., 2012). Research has shown RSDT to have some effect in preventing further student-athlete drug use, but may have the tendency to be affected by additional elements (Goldberg et al., 2007; Kwan et al., 2014; Sznitman et al., 2012).

Multiple studies centered on using a large number of subjects brought value to the idea of RSDT decreasing drug use. Madras et al. (2009) analyzed nearly 460,000 subjects at multiple healthcare sites for a six-month period. Results indicated significant decline for illicit drugs and

alcohol in comparison to baseline testing while RSDT was in place (Madras et al., 2009). Pesce et al. (2011) tracked the progress of 87,000 patients while drug testing ensued in multiple clinic sites. The authors found any use of illicit drugs to decrease from 23% to 9% over the course of 14 separate testing occasions (Pesce et al., 2011).

Another study with a large population found significant decreases in drug use among test subjects. A sample size of 500 subjects engaged in urinalysis testing for any form of illicit drug use (Manchikanti et al., 2006). Results found 80 patients to test positive for marijuana, cocaine, methamphetamines, and amphetamines. Sixteen percent of subjects failed a urine test, which indicated a significant decrease in illicit drug use when compared with previous data (Manchikanti et al., 2006). RSDT has proven to be effective in decreasing drug use although there is some uncertainty in solving the problem of not knowing if RSDT will eliminate drug use. Gathering student body perception of RSDT effectiveness in deterring drug use adds to the already established research and additional reasoning for school districts when deciding to implement RSDT. The concern for district administration considering RSDT implementation centers around the most significant drug used by adolescents, alcohol (Bolland et al., 2016).

Alcohol-Related RSDT Results

According to Bolland et al. (2016), alcohol is the most commonly abused drug among high school students. According to Spear (2016), adolescent alcohol use increases chances for a decrease in cognitive functions such as working memory, increases in social anxiety, and accelerated chances for future drug and alcohol use. Schmidt et al. (2016) conducted a meta-analysis of more than 14,000 participants, which included brief interventions to deter alcohol use. The results found drug testing to be the only consistent method to decrease alcohol use among adolescents.

Additionally, Glass et al. (2015) conducted a study using drug testing as part of a brief intervention process. Results showed there is a lack of efficacy in drug testing decreasing alcohol use. The majority of research continues to reveal drug testing as a successful deterrent to drug use. The research revealed mixed results when studying RSDT effectiveness on alcohol use with large sample sizes, which might create hesitation for districts to implement RSDT. The authors compiled survey results from a large participant group directly involved in a school district using RSDT. Evidence from the survey results adds assistance to other districts when choosing whether to implement RSDT. School district administrators also need to consider RSDT's success in deterring the most popular illicit drug, marijuana, before implementing drug testing (Johnson et al., 2017).

Marijuana-Related RSDT Results

Marijuana is the most commonly used illicit drug in the U.S. not only among adolescents, but the population as a whole (Hefner et al., 2016). According to Levine et al. (2017), adolescent cannabis use has a negative impact on the brain with regard to cognitive and psychiatric outcomes. Additionally, according to U.S. surveillance data as of 2015, 14% of adolescents reported marijuana use in the past 30 days (Johnson et al., 2017). According to research compiled at the University of Michigan from 1998-2011, marijuana use was moderately lower in schools engaging in RSDT (Terry-McElrath et al., 2013). Goldberg et al. (2003) also found RSDT to reduce student body marijuana usage while studying two separate school districts.

As some districts found success in reducing marijuana use, other districts not only found no change, but a change in student attitude (Goldberg et al., 2007). Goldberg's follow-up study utilized 11 school districts and found the student body to no longer believe RSDT would decrease marijuana use. Additionally, Sznitman and Romer (2014) engaged in a one-year study

showing no reduction in marijuana use among student-athletes. James-Burdumy et al. (2012) conducted a six-month longitudinal study using 36 school districts results and found no effect on marijuana use in RSDT participants.

Research studies focused on drug testing for marijuana use varied in results for decreasing usage, which was similar to some alcohol and illicit drug use studies. According to Bahrke (2015), alcohol results are inconclusive enough for school districts to hold off on paying for RSDT. Although Levine et al. (2017) found cannabis use leading to poor cognitive abilities, longitudinal and large sample sizes were suggested to add validity to claims as more needed to be done. Buchan et al. (2002) conducted research focusing only on marijuana and suggested further testing was necessary due to inconsistency in findings for multiple groups of adolescents ages 12-18.

As the literature review found mixed results for an overall decrease in drug use, previous research also found inconsistent reviews for alcohol and marijuana specifically. The length and sample size of each study was a factor in the consistency of results. According to past data, larger sample sizes produced not only more accuracy of findings, but evidence of RSDT decreasing marijuana use (Terry-McElrath et al., 2013). This study used a large sample size, which may produce more accurate data, to find a difference in perception of RSDT effectiveness to assist school districts in a decision to implement RSDT. Previous results can provide proof of RSDT success, but the administration of RSDT reveals a look into the legal aspect of testing.

Legality of RSDT

The Fourth Amendment of the Constitution was initiated to protect against unreasonable searches and seizures (Kerr, 2018). In the case of RSDT, this may be considered debatable with regard to how drug testing is executed. According to Butler (2012), ethics comes into play as

well as legal and social challenges to be overcome. When RSDT is implemented, the unreasonable search complaints are typically heard from parents and community members (Sznitman & Romer, 2014). All tax payers living within the community have the ability to complain and alter how RSDT procedures are executed. The administrators associated with this study stated a negative outcry for a violation of privacy from community members when RSDT was implemented in 1999. These concerns had an impact on how the student body and community perceived the execution of RSDT. As student responses were gathered toward the ability of RSDT to deter drug use via survey, athletes may understand the RSDT process, but non-athletes may lack understanding why and how RSDT is executed.

In 1995 the Supreme Court upheld a decision allowing a district to implement and conduct random, suspicion less drug tests for student-athletes (Schug, 2018). According to the clause, if suspicion is present in an individual, a search can be considered necessary. In 2002, public high school officials were granted the right to conduct suspicion-less drug testing for students participating in any competitive extracurricular activity (Conlon, 2003). The drug testing process can become debatable among parents with topics ranging from what is considered random to the specifics of protocol being followed. The following paragraphs reveal the debate regarding government involvement in the RSDT process, along with a potential for financial and legal risks when a district invests in implementation. The importance of understanding the legality of this process is paramount in attaining student, parent, and community support for RSDT (Schug, 2018). Community disagreement over government involvement in regulating RSDT has been expected since the inception of RSDT in athletics (Gibson, et al., 2019).

Government Involvement

A common theme and argument among community members, school district personnel, and the student body is the government should not regulate RSDT (Levy et al., 2007). According to Levy et al. (2007), the federal government imposes specific rules for regulating drug testing. The school districts monitoring this process are a part of the U.S. mandatory guidelines for federal workplace drug testing programs (Levy et al., 2007). Moreover, DuPont et al. (2013b) revealed government officials feel a need to be involved because opinions differ in what is considered doping. According to Lindholm (2013), the main concern is the idea of government regulation taking away fundamental rights of a student body with implementation strategies. The method in which RSDT is implemented can be a debatable issue if the community does not fully comprehend or possess the willingness to research the Supreme Court ruling from 1995 (Lindholm, 2013).

Gibson et al. (2019) conducted a study determining the relevancy of students being forced to participate in the RSDT process, mixed feelings among community and staff members were concluded. Some participants felt the process is legal, fair, and cost-effective due to the increase in rates of drug use among the student body. Others felt the process causes issues for total cost and overall fairness (Gibson et al., 2019). Belsky (2002) revealed government officials refer to the RSDT process as a state mandated action which fulfills an individual's expectations of privacy, security, and fairness. Parent and community member perceptions can lead to disagreements with how the process is regulated and what is being purchased. Government fairness and paying for an uncertain drug testing process to eliminate student-athlete drug use is a concern. As government regulation is a concern for community members, the risk of implementing an RSDT program is a concern for school district administration (Wolf, 2017).

Risks

Along with government involvement in RSDT regulation, the decision to engage in implementation at the high school level presents various risks. Once testing ensues, the positive results for a student-athlete can be debatable and argumentative. According to Kern et al. (2006), drug testing debates can reveal financial risk as a school district may be exposed to expensive litigation issues. Parental and community judgement of fair practice has the power to control decisions to embark upon RSDT (Kern et al., 2006). The community concern is not with punishing those under the influence of drugs or alcohol, the issue is with the nature to which testing administrators infringe on student rights (Wolf, 2017).

If community perception is centered on whistleblowers being unreasonable, there may be parental encouragement to not engage in athletics. A study focused on the experiences of professionals conducting RSDT (Erickson et al., 2018). Because of parental and student-athlete negative perceptions, certain items need to be addressed to ensure RSDT success. Districts need to provide protection for whistleblowers, along with providing RSDT education prior to the beginning of testing. School districts are placed in a position to weigh the risks of implementing RSDT (Wolf, 2017). According to Erickson et al. (2018), financial and ethical concerns are bound to require attention from administration, understanding how to handle these concerns is vital to success. After legal concerns are addressed and implementation has begun, the concern is now focused on a student body following testing procedures.

Strategies and Procedures While Conducting RSDT

After the Supreme Court ruled on the RSDT case, schools now have the option of utilizing implementation procedures for students (Driver, 2018). After a decision to implement RSDT is made, students are expected to follow testing procedures appropriately; but guidelines

are not always followed properly. According to Ragab et al. (2017), the concept of tampering is a known element student-athletes may embark upon to cover up a positive test. The majority of RSDT testing centers focus on positive or negative urine samples. Lin et al. (2018) investigated more than 21,000 urine tests submitted through drug testing, and tampering was found to be a legitimate concern. Tampering scenarios including dilution, substituted, or invalid were analyzed. Diluted tests occurred in 89.2% of the tests, 6.8% were substituted, and 4.1% were considered invalid (Lin et al., 2018).

Because of the concern with validity of urine testing, close attention is needed to ensure the procedure is reliable. Hoyt et al. (1987) determined the importance of urinalysis methods by surveying drug testing experts, testing laboratories, and arbitrators with regard to legal defensibility. It was concluded, the analytical methods utilized directly controlled the urinalysis results ability to hold up in court (Hoyt et al., 1987). As RSDT testing ensues inside a school district, ensuring tampering was eliminated during testing procedures is important. If a student body perceives tampering to be an issue with RSDT, making results illegitimate, this type of perception may alter survey responses. The following paragraphs review strategic and procedural literature as administrators conduct RSDT, while focusing on the issues of tampering and community comprehension. This study focuses on student body perception of RSDT effectiveness, if tampering is perceived to alter testing results, this could bring a negative perception (Weston, 2017).

Tampering

The idea of tampering with a drug test is a real possibility for a student-athlete who has engaged in drug use. When student-athletes are at risk for suspension or expulsion from an athletic program, the temptation to ensure this does not happen may produce desperate actions.

Weston (2017) found boosting athletic performance and accelerating team success were among the reasons for tampering with drug tests. In relation to the study conducted by Weston, if a student body suspects tampering is a common occurrence, the way in which each survey question is answered and even overall survey results could be skewed. According to Mahajan (2018), athletes who have not experienced the drug testing process are generally suspicious about other students being tested cheating during the urine test to alter results. The student body and parents are educated prior to a drug test administered at the target high school, but stigma can alter perception of RSDT effectiveness in deterring drug use.

Drug testing administrators are aware of the potential for student-athletes to use foreign urine, along with diluting a sample to avoid a positive test. Jaffe et al. (2016) engaged in a study focused on ways student-athletes could tamper with urine testing procedures. The study was initiated through the use of specific products and compounds. Because results showed a propensity for student-athletes to tamper, future studies were conducted while adding a witness for the urine test (Jaffe et al., 2016). While comparing NCAA drug testing policies with high school implementation, NCAA officials face controversies with respect to a right to privacy (West & Ackerman, 1993). NCAA administrators stand directly in front of an athlete and physically witness the test to eliminate potential for tampering. As an administrator is trained and witnesses the urine sample procedure, a decrease in tampering instances makes sense. Jaffe et al. (2016) highlighted the parameters surrounding the execution of RSDT to reduce tampering before revealing the student body survey results.

The concept of tampering has become a clever endeavor for drug users to explore certain methods. According to Pascali et al. (2018), the majority of drug users having to engage in drug testing will utilize the internet to acquire an understanding of how to tamper with results. Opiate

users specifically run a high risk of lethality due to opiate content mixing with household items to skew drug tests (Pascali et al., 2018). Adolescents can use a variety of products to skew RSDT results if experiencing desperation to produce a negative test. Accurso et al. (2017) found adding a liquid or powder to a sample of urine can deter a testing procedure. Results showed 18% of subjects utilized a urine spiking supplement to shield a positive test (Accurso et al., 2017).

Because tampering has become prevalent among adolescents, research was pursued to assist in regulation. New research discovered testing methods to identify foreign compounds of student-athletes using a synthetic form of urine. Goggin et al. (2017) found 2% of samples in a drug testing study to contain two separate compounds not present in typical biological samples. Additionally, Cook et al. (2000) found laboratories now have the ability to measure the consistency of biochemical metabolic waste products to determine validity of a urine specimen. These tampering scenarios might alter how a student body feels about RSDT procedures, along with discouraging school districts to shy away from RSDT as inaccuracy of results is a possibility.

If a district decides to implement RSDT, having methods to counteract tampering instances is important to increase reliability of testing procedures. These methods can be as simple as having an administrator be present, and witnessing the urine sampling procedure. As expected, positive urine test results increase dramatically while a witness was involved (Mallya et al., 2013). Utilizing a witness to decrease the chances of tampering is also an option for testing organizations. McNeil and Cogburn (2017) found clinicians to be more likely to add a witness, but this now requires accelerated awareness when looking at the dilution of a urine test.

Tampering situations create setbacks in how RSDT procedures are conducted, which may lead a school district to question RSDT. There are methods to remedy these scenarios in which

SportSafe Inc., the testing organization used by this study's target district, uses to decrease tampering. Athletes most likely understand RSDT testing protocol, but non-athletes may not have the same understanding. Each level of understanding of testing protocol could affect the way each student answers the survey, thus altering the responses and perception of RSDT effectiveness in deterring student-athlete drug use. Drug testing officials are obligated to try and eliminate student-athlete tampering, but ethical conduction of an RSDT appointment is also crucial for community support (Pascali et al., 2018; Thevis et al., 2015).

Conduction of Testing

As tampering continues to be a concern for school district athletic administrators and RSDT conduction officials, attentiveness to ethical conduction procedures is important. Thevis et al. (2015) found RSDT analytical strategies to be altered as administration becomes more educated with human physiology and the body's metabolic response. The conduction procedures are liable to change to ensure consistency in ethical practice because of these advancements. Wish and Gropper (1990) conducted a study to gather perceptions of RSDT administrators toward procedures used in urine sampling. Results found RSDT officials to be consistently aware of the legal and ethical issues in question while conducting testing (Wish & Gropper, 1990). Funding and overall community support have become the essential pieces for a district to implement RSDT. Comprehension of the need for RSDT, along with trust in officials to conduct RSDT with integrity and ethics is important for community support.

When a district is creating community understanding toward why and how RSDT is conducted, there isn't a higher power to consult than government officials. In 2002, the federal government issued a plan of attack to combat drug use, which provided a template for many districts around the nation (Bush, 2010). President George W. Bush first issued the *National*

Drug Control Strategy by utilizing the services of drug testing and drug prevention education (Bush, 2010). The results pointed to an 11% decrease in youth drug use during the first two years, and a 23% reduction during the first five. The President's strategy met the goal of reaching a 25% reduction of illicit drug use among America's youth (Bush, 2010). Future statistics found adolescents who do not participate in drug use by 18 years or earlier are less likely to develop addiction problems in the future (Bush, 2010). Yule and Prince (2012) conducted research focused on adolescents specifically, which found those who engage in substance use during the ages of 13-18 to have an 11.4% chance to engage in lifetime prevalence.

The positive statistical movement of controlling drug use is an important element as the conduction of how testing is executed becomes essential for accuracy. Momaya et al. (2015) reviewed how RSDT is conducted, the importance of administrators' thoroughly understanding the process before testing ensues was concluded. Test administrators must acquire education regarding the physiology, performance benefits, potential adverse effects, and testing procedures. Additionally, Hadland and Levy (2016) conducted interviews with drug testing clinicians to gather test administrator perception of testing results. These regulating officials felt positive test results convey limited information and can be misleading (Hadland & Levy, 2016). Responses concluded drug testing administrators should carefully interview students before testing, along with reflecting on collection protocols to ensure accuracy.

If districts decide to invest in RSDT, community support of the testing process is vital. Understanding the process of tampering and how to properly conduct testing procedures produces a positive or negative mindset toward RSDT, which directly affects student body attitudes. Elliott et al. (2018) found community and student body attitudes toward the RSDT process to directly affect a school official's decision to implement into a district. If a district's

administration can earn community trust within the RSDT process, the overall attitude toward RSDT can be positive.

Attitudes Toward RSDT

RSDT may be a controversial subject for a variety of communities amongst not only the student, but also the parents and community alike. From a student perspective, Erickson et al. (2017) utilized a small sample of student-athletes to gather perceptions toward how positive urine tests are reported. The survey concluded the majority does not want to report a positive test to regulating officials. Instead, the majority felt a confrontation between athletes is necessary and would not only protect the student-athlete being tested, but the RSDT administrator (Erickson et al., 2017). Elliott et al. (2018) conducted a study focused on positive testing results, which found suspending, expelling, or issuing repercussions to be common punishments. Additionally, Elliott et al. (2018) discovered differences in punishment while comparing high and low-performing athletic departments to be frequent. Perceptions of testing procedures and differences in punishments can lead to controversial issues regarding fairness, selection process, conduction of testing, and overall effectiveness of testing for a district's student-athlete population.

The literature pertaining to student attitudes toward RSDT provides a centerpiece for this study. Student perception toward RSDT effectiveness in deterring student-athlete drug use toward the RSDT process was revealed. The following paragraphs examine attitudes toward RSDT for students, parents, and community members.

Student Attitudes

Some student bodies have mixed feelings toward being tested for drugs and alcohol (DuPont et al., 2013b; Russell et al., 2005). RSDT may be implemented with student-athlete approval if each feels truly cared about by leadership. Cornell and Huang (2016) found

leadership administering RSDT within an authoritative climate to be directly associated with positive outcomes and attitudes from students within a school setting. Results showed alcohol and marijuana use at low levels, along with bullying, fighting, and even psychological well-being (Cornell & Huang, 2016).

Russell et al. (2005) also indicated students were more likely to endorse RSDT if one was already participating in sport. Student-athletes not using drugs or alcohol prior to the beginning of testing were found to be more accepting of the RSDT process (Russell et al., 2005). DuPont et al. (2013a) found student awareness of the potential to be drug tested resulting in lower rates of drug use. All of these results reveal the power of a structured atmosphere to influence student-athlete feeling. Investment in student-athletes from coaches, teachers, and administrators generates an opportunity for RSDT to be accepted by the student body.

On the other hand, Russell et al. (2005) submitted numerous statistics associated with a variety of scenarios and the feelings of student-athletes. Results found students felt drug testing would not deter overall usage. Student-athletes not subjected to RSDT were apprehensive about drug testing implementation (Russell et al., 2005). Fairness was a common response among those students in opposition of drug testing. These students were found to be more accepting if teachers, coaches, and staff were subjected to drug testing. Although DuPont et al. (2013b) found the potential of being drug tested to lower drug use, not trusting the RSDT system can create bitterness and questions about fairness. Results also indicated students not subjected to RSDT felt implementation would be a violation of personal privacy (Russell et al., 2005).

A student body may have a hard time trusting in the idea of drug testing being randomized. Starcke and Porter (2019) conducted a survey focused on how students are chosen to participate in RSDT. Results were centered on the randomization process being unfair with a

focus on racial and stereotypical administrative choosing of participants (Starcke & Porter, 2019). Cornell and Huang (2016) found an authoritative RSDT climate to decrease drug use, but a perception of unfairness can deter progress. Results may also give additional school districts an understanding as to how receptive the student body is to RSDT protocols. As RSDT can be controversial amongst a student body, parent and community support is important for students to accept the process (Hadland & Levy, 2016).

Parents and Community Members

Among parents and community members, RSDT can be controversial. A person may assume community members would be excited for RSDT to try and eliminate adolescent drug use. However, the process of fairness, cost, and potential punishment for student-athlete violations can be contentious. Parental decision making can have an impact on how a student makes choices.

Vermeulen-Smit et al. (2015b) found marijuana use of students is somewhat predicated by parent usage. If a parent uses cannabis, children are more likely to use; if a parent does not, children have a better chance of not using. Results also indicated those parents who do not use are more likely to agree and invest in the RSDT process (Vermuelen-Smit et al., 2015). Additionally, Andreas et al. (2016) conducted a survey given to over 25,000 middle school and high school students regarding cannabis use. Results indicated those students with a positive parent-child relationship were less likely to use. Of those students, the majority felt a parent would agree with drug testing implementation (Vermuelen-Smit et al., 2015). This dynamic can ease student-athlete acceptance of the RSDT process.

According to Rathbun (2011), a potential issue with implementing a drug testing program centers on a lack of communication during the process. Details about how RSDT will be

conducted, instruments to be used, and what will occur if a student-athlete would test positive is understandable. Hadland and Levy (2016) conducted interviews with testing site clinicians to acquire methods of communication during drug testing. The majority of clinicians suggested an interview with adolescent testers and potentially parents prior to testing (Hadland & Levy, 2016). This tactic creates an opportunity to discuss procedures and exactly what is being tested. These conversations can also lead into discussions centered on using test results to validate or refute parental expectations or concerns.

RSMT implementation can be a difficult adjustment for community members and parents as all parties want to be informed about why changes are being made. Rathbun (2011) revealed student and parent perceptions toward drug testing to be negative when certain information is not conveyed. Not being informed about why a drug testing policy has been implemented for a district was a concern for students and parents (Rathbun, 2011). Additionally, there were issues with a lack of information regarding testing procedures and consequences due to testing failures as well. If parents understand how and why RSMT is being executed, the potential to become an asset to deter use is very probable (Rathbun, 2011). Chan et al. (2017) conducted a longitudinal survey utilizing drug experiences of adolescents. Parental approval of drug testing and disapproval of drug use was found to be directly associated with reducing substance use (Chan et al., 2017).

Punishment of student-athletes for positive test results and execution strategies of RSMT are concerns for parents and community members before supporting school district efforts. Furthermore, there is concern for how tax dollars are being utilized within a school district. According to Rathbun (2011), when a financial burden is removed from the equation, parents and community members are more liable to listen and potentially accept new policies. In fact,

Rathbun (2011) revealed results from a period of grant funding for RSDT, which showed a decrease in drug use among students in a particular district. Because of these positive results and the utilization of grant money to fund the RSDT program, parents and community members exhibited positive feedback (Rathbun, 2011). Gannon (2017) also found taxpayer contributions toward rehabilitation facilities may be lower if addiction is at a low rate. Gannon (2017) went on to explain how implementing drug testing costs taxpayers more money in comparison to not. The majority felt drug testing did not deter drug use, and the choice to not engage would enable saving dollars (Gannon, 2017).

When drug testing is implemented in a school district, communication with parents and community members increases chances of acceptance (Chan et al., 2017; Rathbun, 2011). According to the SportSafe Inc. administrator during an interview, the target school district for the study has consistently invited parents and community members to attend RSDT protocol informational meetings since the inception in 1999. These meetings consist of SportSafe Inc. administrative members who conduct the drug testing, along with school district athletic administration responsible for governing the RSDT process. Additionally, the cost per pupil is also discussed so tax payers and stakeholders understand the financial details surround the process.

As this study's survey attempts to answer the research question of establishing a statistical difference between athlete and non-athlete perception of RSDT effectiveness on drug use, student understanding of the RSDT process and parent attitudes toward RSDT may alter survey responses. The next section presents literature concentrated on those opposing RSDT, along with reasoning behind those opposing views. Parental and community support is a key entity to not only RSDT implementation, but the attitudes of student-athletes participating. When

community members oppose RSDT implementation reasoning is typically associated with cost and effectiveness (Doyle & Strathmann, 2016).

Arguments Opposing RSDT

Convincing a school district to implement RSDT to combat student-athlete drug use can be a difficult task. Alternative methods to deter drug use such as consequences and education can be arguably more effective. Doyle and Strathmann (2016) found the elements of cost to implement, along with overall effectiveness to be legitimate concerns. Although recent research found urine testing to be cost effective, fast, and easily interpretable, any cost to taxpayers can be unsettling (Doyle & Strathmann, 2016). Weston (2017) found the struggle for a community to accept RSDT implementation focused on the overall effectiveness in deterring drug use for students even after high school. As a cost is required to pay for a professional organization to test and analyze student-athletes, the overall effectiveness in deterring drug use is not guaranteed.

Coker et al. (2018) conducted a survey of collegiate students after experiencing drug testing. Results found more than 85% of students felt repeated testing was necessary. Additionally, more than 90% of students felt repeated testing would promote long term knowledge (Coker et al., 2018). These numbers show a tendency of drug testing not being successful during initial testing. When researchers attempt to analyze the effects of RSDT on overall drug use, revealing results showing a consistent pattern of failures and repeat testing can be a downfall in gathering support (Bruneau et al., 2018). If follow-up testing is necessary, additional funding for drug testing must be available within a school district.

A study from the U.S. Government beginning in 2000 showed a 137% increase in drug overdose deaths through 2014 (Rudd et al., 2016). These research statistics may have the potential to generate a push to implement a plan to reduce drug use. Bruneau et al. (2018)

suggested drug testing to decrease overall drug use, specifically synthetic opioids. The argument against drug testing implementation, specifically related to opiate use, is opioid addiction is considered a chronic and a relapsing condition (Bruneau et al., 2018). When research points to drug addiction cases in which users have a higher potential for relapse, arguments against drug testing implementation are understandable. Even in the case of alcohol, Foster et al. (1998) conducted a follow-up study for alcohol detoxification participants. Of the 58 admitted alcoholics, more than 62% had relapsed within 12 weeks after treatment had occurred. Because of these increased chances for relapse, Bruneau et al. (2018) suggested to focus more on utilizing funds to administer opioid education to deter drug use.

Implementing an RSDT program will come at a cost from a district, but may be worth the price in comparison to the cost of addiction. Because of the known cost of testing, arguments to implement drug prevention education (DPE) programs as an alternative have been highlighted (Patrick et al., 2016). DPE programs can be a cost-effective and proactive method to decrease student body drug use.

RSDT versus Drug Prevention Education (DPE)

Parents, community members, and a school district as a whole will agree on a goal of keeping a student body drug free. If funds are available, a person may assume many districts would most likely create policies and procedures to make this goal a reality. Researchers have argued RSDT can prevent or limit drug use, however, due to legal issues, tampering, and even perception of unfair practice create questions about the overall impact (Jaffe et al., 2016; Weston, 2017). Drug prevention education programs (DPE) have been argued to make a bigger impact in the fight to combat student-athlete drug use.

Patrick et al. (2016) found the impact of DPE on opioid related deaths to produce an average reduction of 1.12 deaths per 100,000 population. Additionally, Newton et al. (2016) conducted a three-year study focused on the effects of alcohol-related DPE. The authors found a decrease in alcohol use to be directly related to personally-targeted preventative interventions (Newton et al., 2016). Ellickson et al. (2003) conducted a study focused on illicit drug use while using 55 middle schools using a DPE program. Illicit drug use experienced a 20% reduction after a period of 18 months (Ellickson et al., 2003). DPE can be used as a preventative measure, which could arguably lead to replacement of RSDT. But if combined with RSDT, the pair could become a reactive entity to provide protocol for failed drug tests. The success of DPE has the power to motivate a school district to bypass RSDT and invest in educationally preventative measures.

Some district administrators believe education related to preventing student drug use should begin in the early school years. According to Botvin et al. (2006), communities believe drug use is associated with higher levels of violence and delinquency, which needs to be addressed early in a child's life. Durlak et al. (2011) found some districts feeling social and emotional learning (SEL) programs such as DPE necessary as early as Kindergarten. Students experiencing SEL programs produced an increase in social and emotional skills, attitudes, behaviors, and academic performance (Durlak et al., 2011). Additionally, Rosenbaum (2016) felt implementing DPE programs at early stages increase student chances of utilizing decision-making skills in the present and future. DPE tactics involve altering student attitude toward drug use to see a decline. This attitude altering process comprises elements considered to be impactful impressions on a student body (Rosenbaum, 2016). The drawback to DPE involves dependency on classroom teachers to execute the action plan. Teachers must buy into and take the time to

implement DPE. RSDT has the potential to make student body drug issues easier as responsibility is placed solely on athletic administration.

With respect for the information DPE relays to students, Botvin and Griffin (2007) found interactive programs to be the most effective. Botvin and Griffin (2007) concluded, students receive the best feedback from interactive programs concerning the refusal of drug offers, resisting influences, and enhancing social and personal competence skills. As the interactive skills of adolescents increase, internet-based DPE programs have gathered momentum. Vadrucci et al. (2016) researched an interactive DPE program, which was placed in a middle school for 12-14-year-olds. The program was centered on TRA and the problem behavior theory while developing risk perception, attitudes toward drugs, and refusal skills. The authors concluded an increase in a person's ability to cope with stress, problem solve, and make decisions with the presence of drug use (Vadrucci et al., 2016). Mitchell et al. (2015) felt computer-delivered DPE programs possess the ability to lead to improved behaviors in overall health.

The concern with DPE programs derives from the curriculum utilized and information being relayed to each student. Flynn et al. (2015) conducted a lengthy systematic review to find DPE effectiveness is centered on organization and curricula. Malmberg et al. (2015) delivered a questionnaire to 3700 students while focusing on the effects of a DPE program. Results indicated no effect on the substance use of adolescents after 20-and 32-month follow-ups (Malmberg et al., 2015). A student's age is another factor to be considered when deciding what curriculum is being offered. According to Onrust et al. (2016), as a student gets older, the opportunity for substance use increases. Onrust et al. (2016) conducted a systematic review and highlighted the importance of a developmental perspective when implementing a DPE program. As the student-body goes

through various life stages, the need to alter DPE opportunities is vital to drug use reduction (Onrust et al., 2016).

As a DPE program's curriculum is debated through various age levels, RSDT can provide an opportunity for a district to focus only on specific students testing positive. D'Amico et al. (2015) found traditional DPE programs to be ineffective for the student-body as a whole in the middle of adolescence. If DPE is not strategically planned, a district could experience a financial loss. According to Medeiros et al. (2016), the standard teaching schedule must be altered to implement and nurture an effective DPE program. The drawback is a teaching staff member may be asked to sacrifice parts of traditional lesson plans to invest time in DPE. Agabio et al. (2015) conducted a systematic search of over 50 DPE programs to find over half showed no effect on alcohol use. The level of teacher investment in the DPE program was concluded to be a factor in the overall effectiveness of each program (Agabio et al., 2015). As DPE may call upon a teaching staff member to relay drug resistance education, RSDT only utilizes a small number of district personnel to execute the process. RSDT contains the potential to decrease drug use while teachers can stay focused on traditional education.

When discussing new program implementations within a district, the concern is typically focused on money. According to Sundström et al. (2017), computer-delivered methods for DPE can be a cost-effective means of treating or proactively preventing substance abuse. In related studies, computer-based programs were also implemented after students had shown signs of alcohol-abuse (Carey et al., 2009). Research concluded computer-delivered interventions (CDI) generally reduce the frequency and quantity of drinking among those receiving the treatment (Carey et al., 2009). CDI treatments and methods of reduction not only focused on high school-aged students, data pointed to reaching out as early as middle school. Additionally, Newton et al.

(2018) found internet-based programs to not only educate students about substance abuse, there was evidence of reducing alcohol use 12 months after completion. DPE might not only produce a more affordable method to prevent drug use, but if combined with RSDT, drug users who test positive can be referred to rehabilitation as a part of the protocol.

If a school district does partake in the practice of RSDT, having the option to assist students who test positive can be crucial in decreasing instances of relapse. Ringwalt et al. (2009) collected data from a significantly large pool of drug prevention coordinators implementing RSDT. The majority of schools were found to have protocol in place for drug testing failures. Nearly 90% not only notified parents, but face-to-face conversations occurred to plan out where to go next. More than 60% of the schools provided DPE program or counseling options as well (Ringwalt et al., 2009). According to Botvin et al. (1995), a combination of RSDT and DPE programs as early as middle school can significantly reduce alcohol and marijuana use.

The widely respected World Health Organization (WHO) had implemented the Alcohol, Smoking, and Substance Involvement Screening Test (ASSIST) for a number of years. Humeniuk et al. (2018) found the addition of an intervention piece as an option for testing failures revealed high levels of success after follow-up testing occurred. Understanding the nature of the help being provided to the student-body with respect to proactive or reactive measures is important. The current study generated additional opportunities for school districts to witness not only how a student body perceives RSDT effectiveness in deterring drug use, but an opportunity to make inferences into how students, parents, and community trust in the RSDT process.

Gap in Literature

As the literature review was conducted, there was an appearance of a gap in the research. Previous studies did not show significant evidence to solve the problem of RSDT eliminating drug use. Results may show a propensity to decrease drug use with a certain population, but a need to increase the number of times tested comes as a result of an increase in usage (Barthwell et al., 2019). The literature review highlights some basic reasoning for resistance to participating in RSDT, which can be a factor in a program not eliminating the problem. O'Connell et al. (2016) found randomized urine testing to decrease drug use in some individuals. The population as a group used substances at the same rate as before testing began, which lead to more research being conducted (O'Connell et al., 2016). The majority of studies showing decreased results in drug use had a common theme, more research was suggested to solidify RSDT being a consistent drug use deterrent. As research has proven to not be able to solve the problem, this study fills the gap in the research by adding additional research to the idea of RSDT being a consistent drug use deterrent. The research questions were answered by analyzing survey results to determine if a student body perceives RSDT to effectively deter drug use.

Chapter Summary

The research encountered in the literature review paved the way for the current study to ensue. Chapter 2 provided a detailed literature search strategy, along with the theoretical framework elements of TRA and TPB to assist in guiding the study. Previous researchers' inability to solve the problem of eliminating drug use paved the way for this study to occur (Dunn et al., 2012; Herring et al., 2016). As the literature found a decrease in drug use, the majority of those studies suggested more research. The ability to determine if a student body perceives RSDT to deter drug use has the power to add significance to RSDT as a deterrent.

Results from the literature review make this study necessary, which has the opportunity to fill the gap in the research. The results of this study create an opportunity to address the problem of decreasing student-athlete drug use, which has not been resolved.

The literature review provided insight toward why student-athletes engage in drug use, which was addressed through a variety of research studies (Kwan, et al., 2014; Russell et al., 2005; Stockings et al., 2016). School districts embarking upon RSDT in the past were analyzed to determine a trend toward whether drug use deterrence was successful or not. Literature first focused on RSDT having little or no effect on drug use were revealed (Ludkte, 2011; Peretti-Watel et al., 2019; Plotnikoff et al., 2019; Stockings et al., 2016). Research also indicated the ability of RSDT to decrease drug use (Goldberg et al., 2007; Kwan et al., 2014; Manchikanti et al., 2006; Sznitman et al., 2012). A common trend among districts both having success and lacking in decreasing student drug use was a suggestion of more research to formulate conclusive evidence. Legal ramifications were then studied as policies and procedures need to be communicated clearly to parents and community members to acquire acceptance. RSDT is not always accepted by students, parents, and community members, which was shown through research opposing drug testing (Erickson et al., 2017). Research indicated communication with the all involved parties about the RSDT process and protocols is the key determinant in community acceptance.

Literature was directed at the ability of student-athletes to tamper with testing procedures, which may trigger a need to alter testing strategies (Lin et al., 2018). Research suggested a combination of success in sport, along with the ability to perform in the classroom as reasoning for student-athletes to consider tampering if partaking in drug use (Lin et al., 2018). Finally, DPE was studied to compare success rates in deterring drug use with RSDT. Research studies

unveiled DPE as a successful method and alternative strategy to decrease drug use. Additionally, some literature suggested utilizing a combination of RSDT and DPE as potential protocol for those students testing positive. These subtopics work as one to provide potential reasoning for why and how drug testing influences drug use.

The Methodology section highlights the methods utilized to provide survey results in a large school district in Central Ohio. A survey was given to a current student-body inside a school district with RSDT present. Student-athlete and non-athlete responses toward the effectiveness of RSDT in deterring student-athlete drug use were examined. This was addressed through a specific rationale for the design, procedures including instrumentation and sample selection, along with data collection and analysis strategies. The methodology centered on determining if a statistically significant difference exists in perceived effectiveness of RSDT in deterring student-athlete drug use.

Chapter 3: Methodology

The purpose of this quasi-experimental study was to determine if a statistically significant difference existed in perceived effectiveness of RSDT in deterring student-athlete drug use. Determining statistical differences in perception took place among student-athletes versus non-athletes as well as athletes who participate in Randomized Student-Athlete Drug Testing (RSDT) versus those who do not. Student-athletes are at higher risk for drug use relative to the student-body (Lisha & Sussman, 2010). The problem was whether RSDT decreases drug use among student-athletes. A quasi-experimental approach was utilized to compare survey responses about RSDT and drug use from high school student-athletes and non-athletes. A survey approach helped to answer research questions by gathering responses from a large population of participants (Lau, 2017). The survey provided data to determine if there was a statistically significant difference in student body survey responses to determine if RSDT effectively deters student-athlete drug use. The study took place within a high school inside a large school district in Central Ohio. A Likert-scale survey was administered to freshman high school students currently within the high school to analyze responses toward RSDT and its impact on a student-athlete's decision to participate in drug use.

The theoretical framework revealed reasoning for why and how RSDT influences student-athlete drug use. Research also showed a variety of reasons why student-athletes might engage in drug use, which made this study relevant and the results useful for school districts. Rice et al. (2016) found elite athletes to be vulnerable to a range of substance misuse situations related and unrelated to sporting factors. Rice et al. (2016) found pressure to live up to academic and social obligations as reasoning for student-athletes vulnerable to engage in substance abuse. Understanding of a students' behavioral intention may serve as a reason for school districts to

implement RSDT. Districts which engaged in RSDT showed a decrease in drug use for large populations, mixed results for smaller groups, which were over relatively small segments of testing. A 12-month study with a relatively smaller population concluded RSDT had no specific impact on illicit drug use (Yamaguchi et al., 2003), while another one-year study with a larger population revealed a decrease in overall drug use (James-Burdumy et al., 2012).

This study utilized survey results from both student-athletes and non-athletes to determine whether there was a statistical difference in outlook on RSDT. The goal was to identify if a statistically significant difference existed in student body perception toward RSDT. Data may serve to inform a decision or support worldwide school district implementation of RSDT. This chapter revealed the research design and rationale for conducting this study, specific procedures utilized, and how data were collected, prepared, and analyzed. Procedures to establish reliability, validity, and ethics are also highlighted. The following research questions guide the study:

Research Question One. Is there a statistically significant difference between sport participation (athletes vs. non-athletes) in RSDT perception in deterring drug use?

Research Question Two. Is there a statistically significant difference between drug testing participation (those who've had RSDT vs. those who have not) in RSDT perception in deterring drug use?

Hypotheses

The hypotheses for each research question provided the possible outcomes when the survey scores were examined. Each hypothesis compared the survey scores for athletes, non-athletes, drug tested athletes, and non-drug tested athletes. The data collection instruments assisted in answering each research question and delivering hypotheses.

RQ 1, H1o: Sport participation does not reveal a statistically significant difference in perception between athletes and non-athletes.

RQ 1, H1a: Sport participation reveals a statistically significant difference in perception between athletes and non-athletes.

RQ 2, H1o: Drug testing participation does not reveal a statistically significant difference in perception between athletes who have had RSDT and athletes who have not.

RQ 2, H1a: Drug testing participation does reveal a statistically significant difference in perception between athletes who have had RSDT and athletes who have not.

Research Methodology, Design, and Rationale

This quantitative quasi-experimental design was used to examine if a statistically significant difference in athletes and non-athletes exists in perception of RSDT effectiveness in deterring student-athlete drug use. Quantitative research focuses on deciphering the relationship between two variables within a specific framework (Yilmaz, 2013). According to Yilmaz (2013), when quantitative analysis does not manipulate the independent variables (athletic participation and testing status), there is an opportunity to assess the statistical differences between the independent variable and the dependent variable (survey composite mean score). Quantitative methodology also enables gathering of quick information and clear descriptions of results (Lau, 2017).

A survey was used to acquire data from a large group of participants in a short time. Data were gathered via survey among students who participated in athletics, along with students not participating in athletics. The goal was to answer the research questions by analyzing responses which determined if a student body estimated RSDT to be a useful deterrent of student-athlete drug use. These responses contributed to determining if a statistically significant difference

existed in survey scores among athletes and non-athletes, which highlighted if the student body perceived RSDT to deter drug use. A quantitative design was appropriate as Lau (2017) found observing events exposed to independent variables revealed a difference between two separate groups. The independent variables of athletic participation among a student body and drug testing status among student-athletes exposed a difference in perception of RSDT effectiveness in deterring student-athlete drug use.

The quantitative study examined the difference in composite survey scores focused on perception of the ability of RSDT to deter drug use among four total groups to answer two research questions. A qualitative method was considered and seemed to be directed toward gathering thoughts and perceptions of participants, but those are typically focused on smaller participant groups (Bryman, 2017). This study utilized a larger sample size which was welcomed by quantitative analysis and tends to be limited by the qualitative method (Bryman, 2017). According to Cornelissen (2017), quantitative research tends to be more objective than qualitative as one anticipates data showing precise measurements to answer research questions. Additionally, the risk for subject bias tends to increase with qualitative research in comparison to quantitative (Bryman, 2017). To achieve the study's goals and answer research questions a quantitative approach was appropriate due to allowance of objectivity, elimination of bias, and utilization of a larger sample size to acquire data (Cornelissen, 2017).

This study used a quantitative design to determine if the difference exists among participants through a designed survey given to research participants within a student body experiencing RSDT. The composite mean survey score of a student body was the dependent variable of interest. The first independent variable was sport participation and whether or not a student taking the survey was an athlete or non-athlete. The next independent variable was

whether each student has been drug tested and experienced the entire RSDT process or not. This study sought to discover how the independent variables affect the dependent variable within a student body population. Survey responses determined the degree to which students estimate RSDT to effectively deter student-athlete drug use. The survey was instituted to a group of freshmen inside a high school utilizing RSDT for its athletes. The study reflected the research questions, which are designed to interpret the statistical difference between athletes and non-athletes' composite scores. Each question determined student body perception of the ability of RSDT to deter drug use.

This quantitative study utilized a quasi-experimental design to determine if a statistically significant difference exists between athletes and non-athletes' perception of the ability of RSDT to deter student-athlete drug use. A quasi-experimental approach was considered appropriate as the method is used to generate casual evidence for long-term health outcomes such as student-athlete drug use (Bärnighausen et al., 2017). According to Creswell et al. (2006), experimental research answers research questions focused on effectiveness of a specific treatment (RSDT on drug use). Additionally, Reeves et al. (2017) found a quasi-experimental design to be the best when random group assignment is not possible and naturally occurring groups are utilized. The survey given was a Likert-scale and used ordinal data. This type of data gave a clear indicator whether a student body perceives the treatment (RSDT) has the intended effect on a population (Creswell et al., 2006).

The first quantitative design for consideration in this research study was descriptive research. This design was not appropriate as a hypothesis is only developed after data collection, this study established a hypothesis prior to data collection (Shields & Watson, 2016). A correlational design was also considered, but this method did not establish a statistical difference

between two groups. Correlation does not allow two variables, RSDT and drug use, to be manipulated as each was not monotonic and RSDT does not vary year to year (Shields & Watson, 2016). An experimental design was first considered, but some research suggests using a control group not present in this study, along with random group assignment (Shields & Watson, 2016).

An experimental design was possible if research questions focused on establishing a statistically significant difference between two groups. The quasi-experimental design considered was a casual-comparative approach. Casual-comparative designs attempt to establish a cause and effect relationship among variables, but this was not needed as this study was already assuming RSDT has an effect on drug use (Schweizer et al., 2016). Bärnighausen et al. (2017) also found casual comparative designs to be a subset of quasi-comparative designs, which also use archived data. A quasi-experimental approach was chosen as this method was found to play an important role in establishing effective health-care practice through statistical comparison among participants (Bärnighausen et al., 2017).

A quasi-experimental study had the ability to add efficacy to the idea RSDT may deter drug use, which promotes real world effectiveness (Schweizer et al., 2016). The quasi-experimental approach creates an opportunity to answer the research questions as survey data were analyzed and compared among each group to determine if a statistically significant difference exists. In the case of this quantitative study, using a quasi-experimental method enhanced the quality of research as perceptions were gathered from a student body experiencing RSDT. According to Schweizer et al. (2016), quasi-experimental studies evaluate the differences among participant groups between an intervention (RSDT) and an outcome (student perception of RSDT effectiveness).

During this quantitative quasi-experimental study, students participated in the same survey to reveal insight into how each group (athletes and non-athletes) estimated the ability of RSDT to deter student-athlete drug use. This study explored responses from a group which does not often have the opportunity to contribute to the RSDT process—the student body. The survey responses formed the basis for how the student body estimated RSDT effectiveness in deterring student-athlete drug use. Educational leaders can use these results as further evidence when deciding to implement RSDT into a district.

Research Procedures

Freshman students in the high school were invited to take part in one anonymous survey as a part of a regular class (see Appendix A). A letter was sent home with each ninth grade health class student to receive informed consent from a parent or guardian for participation in the study and survey (see Appendix B). A student assent form was administered to obtain student-body consent to participate in the survey (see Appendix C). District and high school administrative permission were obtained with signatures from proper sources at each level (see Appendices D & E). If a student or parent/guardian opted out of the survey, the student remained inside the room partaking in the optional alternative activity. The alternative Health class unit activity included classroom worksheet options only for those students who did not wish to participate in the survey. The worksheet was not for credit or as a submission requirement and was optional. Using this approach did not punish either group of students for participating or opting out of the survey.

A restricted item survey was utilized because each participant had experience participating or being around participants of RSDT inside the district in which drug testing took place (Arnulf et al., 2014). The specific school district as a location for the study was important to the experiences and responses of the student body. RSDT has been in place inside the target

district since 1999 and is currently still in use. The participants included half of the school's freshman class, which consisted of male and female athletes and non-athletes. The diversity of the participants (athletes vs. non-athletes) brought a unique perspective as responses toward RSDT effectiveness in deterring student-athlete drug use were likely to be different (Carter et al., 2019). According to Reker and Chamberlain (2000), gathering responses from those experiencing RSDT was the best method to analyze effectiveness. To identify RSDT as a perceived deterrent to drug use, gathering and analyzing responses from students within the study's setting was important in determining if a statistically significant difference in perceived RSDT effectiveness existed.

Population and Sample Selection

The target population was a group of 230 freshman within the large school in Central Ohio. Each freshman was a member of a semester health course which consisted of males and females. The survey instrument revealed two different categories consisting of four groups before analyzing data. The first category was athletes and non-athletes. The next category was strictly from the athlete population and consisted of those who have been drug tested through RSDT and those who have not been drug tested through RSDT. Freshman not participating in athletics do not participate in drug testing, but are students within a school promoting the process, and socially around student-athletes who participated in RSDT. Analysis of data compared the perceptions of each of the four total groups. Participant groups were labeled athletes, non-athletes, athletes who have been drug tested, and athletes who have not been drug tested.

A large percentage of survey participants consisted of student-athletes as more than 70% of the student body participated in athletics. The other students were categorized as non-athletic

participants. Criteria for participation in the survey included a health class enrollee and a freshman at the high school. This study's survey consisted of 230 potential participants. The sample size A priori was supported by Statistics Kingdom, which is a virtual sample size calculator. Results showed 158 participants to be an appropriate number to complete the survey to gain the power of .802200 (80%). This number of participants was lower, but finding statistical significance with a group over 100 participants was still considered a large participant group (Moston et al., 2015). According to Heidel (2016), using a larger sample size may identify outliers and provide more accuracy in acquiring values for mean. These elements create a smaller margin for error in comparison to a smaller sample size (Heidel, 2016). Researchers running a statistical analysis on randomized drug testing found a large sample size useful in acquiring accurate mean values to determine effectiveness (Moston et al., 2015).

Quantitative research welcomes larger populations to be used as subjects for a research study (Bryman, 2017). The sample size was closely related to RSDT survey results for 276 participants in another RSDT study (Goldberg et al., 2003). Goldberg et al. (2003) found survey results for this sample size to be very useful in determining if RSDT was reliable in deterring student-athlete drug use. These previous studies suggest a participant size over 200 was appropriate to produce a statistically significant analysis.

Findings associated with a well-constructed survey has the ability to aid organizations in decision making (Artino, 2017). District administration, along with the drug testing governing body SportSafe Inc., suggested the student body as the sampling frame. SportSafe Inc. is a national organization which focuses on regulating drug testing protocol for a large number of school districts around the country. A student body survey was also suggested by the SportSafe Inc. administrator during an interview and was determined to be the best method to assess

effectiveness of RSDT. The sampling method focused on voluntary participation from each freshman health class student. The target high school resides inside a city within an affluent county in Central Ohio. According to Porter and Whitcomb (2005), students and parents from affluent communities are more likely to willingly participate in a survey than non-affluent. The survey was given to a group of 230 freshman students in one of the four high schools within the district.

All health class students were given an Informed Consent (see Appendix B) form for parents to read and sign to participate in the survey. Additionally, a Student Assent form (see Appendix C) was required for each student to sign before taking the survey. All communication regarding the survey process including dates and responsibilities of participants were given to students and parents via paper copy. The recording of each student and parent signature on the paper copy was then stored inside the athletic director's office in a locked filing cabinet. Additionally, all demographic information was filled out at the beginning of the survey for each participant (see Appendix A).

Instrumentation

This study utilized a survey instrument to assess student body responses toward RSDT. The instrument was created after analyzing survey questions from past drug testing studies (Hess, 2010). The survey scores answered each of the two research questions by determining if there was a statistically significant difference in perception. The first comparison of perception focused on athlete and non-athlete survey responses. The next comparison focused on the athlete group only. The study revealed differences in perception for athletic participants who have been drug tested with RSDT and athletic participants who have not been drug tested with RSDT.

The purpose of the survey was to determine if a statistically significant difference existed

in perceived RSDT effectiveness for student-athletes vs non-athlete responses. Additionally, responses for those who participate in RSDT vs those who do not were compared to determine if differences existed. Each question attempted to analyze student body responses toward the ability of RSDT to deter drug use to evaluate the survey content, a panel of experts was established to assess the validity. According to Grant and Davis (1997), content validity experts are frequently used in the judgement-quantification stage of instrument development. The six subject matter experts provided feedback toward the survey questions which were considered and implemented.

Before administering the survey to the participant group of high school freshman six subject matter experts were utilized to review the instruments. A Cronbach Alpha test was implemented to test for reliability and internal consistency, which was an essential part of implementation proceedings. The Cronbach alpha test was a popular choice for researchers to prove a survey was reliable through demonstrating a fit for a specific purpose (Taber, 2018). Cronbach alpha approval creates comfort in a reader interpreting a research study as dependability in creating a reliable survey was achieved prior to collecting data (Wauters et al., 2016). A survey meeting a reliability coefficient of .70 or higher is widely considered to be an acceptable instrument (Cho & Kim, 2015). According to Peters (2014), if the Cronbach Alpha reliability coefficient is not met, there are a couple suggestions to improve the reliability of the survey. More statements may need to be added to constitute to the construct, which can accelerate the reliability coefficient. Additionally, a failing reliability score may improve if survey statements are removed or replaced (Peters, 2014).

The single survey instrument was administered via paper copy for all students participating. According to Maeda (2015), a study focused on developing surveys found the

majority of researchers feeling as if a researcher-developed survey increased overall validity. The instrument used was a 10-point Likert-scale survey. Likert-scale surveys are utilized to assess relative and absolute judgements in attitude (Maeda, 2015). To establish validity, the participants were allowed to look at the survey questions on an overhead projector one day prior. If there were any questions about the survey, those inquiries were answered prior to the start. According to Arnulf et al. (2014), having options to choose from during a survey (Likert scale) allow a researcher to not predict specific response patterns, which could be considered bias.

The survey consisted of 12 statements, which were evaluated multiple times to assist in improving the survey before delivering to the participants. Through an extensive process of considering expertise from previous researchers and consulting subject matter experts in various fields, each statement was thoroughly investigated and tweaked over time (Hess, 2010). According to Meurer et al. (2002), establishing validity by consulting experts in closely related fields assists with developing a clear and concise survey.

The survey instrument was designed to align with the research questions and reveal if each student body group felt RSDT was a formidable solution to deter drug testing. The validity of survey content was ensured through a rigorous and objective group of subject matter experts, along with generating questions from the original research questions. Survey questions were associated with gender, sport participating in (if any), and statements centered on the extent to which each participant felt RSDT deters or does not deter drug use. Other than gender and sport participation, answer choices scaled 1-10 with attitude leaning toward a disagreement for the lower number and agreement for the higher number. 1- Strongly Disagree; 10- Strongly Agree (see Appendix A). The first set of statements focused on freshman student feelings about if students in the high school are using and abusing drugs. The next set of statements were

implemented to gather feelings toward RSDT and preventing drug use, making students think about using drugs, and whether or not RSDT is helpful for student-athletes. The final set of statements dealt with participation in athletics and if RSDT makes students not want to participate in athletics.

Data Collection

Before conducting the survey, written permission was requested and obtained from the school district administration at the Superintendent's Office (see Appendix D). The attachment letter required a signature from the Superintendent or Chief Academic Officer giving permission to conduct the survey at the high school. Additionally, written permission was requested and obtained from the high school principal of the target high school (see Appendix E). Each letter highlighted the purpose of the study, time needed to complete, confidentiality protocol, and how responses were to be secured.

After IRB approval (see Appendix F), data collection took place during the spring of 2021 inside Health classrooms within a high school in Central Ohio. An informed consent letter was sent home with student body participants two weeks prior to the survey to gather parental permission via signature (see Appendix B). The informed consent letter contained the study's purpose, procedures, and explanations given to each student before taking the survey. After a list of participants was collected, these forms were stored inside a filing cabinet inside the athletic director's office for three years. Additionally, the day of the survey a child assent form was also used to gather a signature from each student participating in the survey (see Appendix C). Student body participants were then given a hard copy of the survey to complete. According to Nulty (2008), paper-based surveys decrease the number of potential mistakes participants make in comparison to a web-based option.

The study consisted of collecting student body responses toward the ability of RSDT to deter student-athlete drug use through a thoroughly constructed 12-question survey. A specific Health class day and time frame was allotted for participants to take the survey with five minutes built into the lesson to complete. Using only one Health class day as the time frame did not accommodate absent students. According to Moston et al. (2015), a participant group over 100 is often adequately statistically powered. The survey was using a potential population group of 230, absent students did not affect the ability of this study to show statistical significance. Students were also told an honest survey is better for survey data, meaning, it is better to not participate than lie about survey responses. After a list of participants was collected, these forms are stored inside a filing cabinet inside the athletic director's office for three years.

According to Reiter and Kinney (2011), not having a method to maintain subject confidentiality and identity protection places risk in violating ethical and legal activity. Exit procedures and confidentiality procedures were detailed in the Informed Consent parent letter, along with the Child Assent form distributed to all participants prior to taking the survey. After the survey concluded and data were retrieved, results were stored inside a locked filing cabinet within the athletic director's office. Data were stored for up to three years before being discarded. There was no need for follow-up contact after the survey concludes, but contact with the lead researcher was available.

Data Preparation

Data collected were analyzed using the most current version of Microsoft Excel 2019 and Vassar Stats 2021. According to Kalra (2016), utilization of Vassar statistical software provides easily interpretable numerical outputs if using normal distributions. After implementation of data (ordinal) into Excel, mean scores were configured for each of the four groupings. Vassar Stats

software was utilized to configure median scores to find if a significant difference existed among athletes and non-athletes survey responses.

Interpretive analysis was essential once all data were collected to assess and combine participant responses (Gummesson, 2003). Cleaning and removing bad data would be accomplished using Microsoft Excel. Bad data consisted of mistakes made by participants in filling out the survey through misinterpretation or potentially skipping questions. Removing missing values can be fixed by running a frequency analysis (Wigboldus & Dotsch, 2016). A frequency analysis was not required as there were no missing values which would be considered bad data present after collecting the surveys. The Likert-scale survey consisted of traditional numerical categories, which allowed ordinal data to be implemented into software programs easier (Vaughn & Turner, 2016). The data file consisted of four categories separated into columns for athletic participant, non-athletic participant, RSDT participant, and non-RSDT participant. The dependent variable, composite mean survey scores was revealed for each category.

Data Analysis

The Data Analysis section consists of descriptive statistics and how data were conveyed after the survey was complete. Additionally, this section describes how the composite mean survey scores for each participant was analyzed. Analysis took place by using the two-sample t-test and ensuring the five assumptions were met. All assumptions for the two-sample t-test are described in the descriptive statistics section, but two assumptions were violated which required further statistical analysis. Due to the violation of assumptions, the Mann-Whitney U test was implemented and all four assumptions were met.

Descriptive Statistics

This section also included descriptive statistics consisting of a univariate analysis, which helped to summarize how each of the participants answered the survey questions. Each of the participants were placed into categories as athlete or non-athlete. Every athlete participant was also placed into a category of RSDT participant or non-RSDT participant. Each of those four groups were placed into a graph highlighting how each group compared in terms of composite mean scores.

The distribution was analyzed by listing each survey question and how each group answered into Microsoft Excel. Every survey question contained a frequency distribution from each of the four groups (Brauchli et al., 2019). Next, the central tendency was described by highlighting the mean, median, and mode for each group's survey responses (Canova et al., 2017). The standard deviation was also calculated by describing the highest value present for each group's survey responses minus the lowest value. This method revealed no outliers (Canova et al., 2017). These results were described through box and whisker plots, along with tables highlighting mean, standard deviation, and number of participants.

The purpose of this quasi-experimental study was to determine if a statistically significant difference existed in perceived effectiveness of RSDT in deterring student-athlete drug use. Determining statistical differences in perception took place among student-athletes versus non-athletes as well as athletes who participate in Randomized Student-Athlete Drug Testing (RSDT) versus those who do not. The comparison among the four groups was accomplished by analyzing the composite mean survey scores from athletes and non-athletes to determine if a statistically significant difference exists. All Likert-scale responses from participants consisted of ordinal data, which assisted in implementing further statistical analysis (Braun & Clarke, 2012).

Coding for this quantitative study included response codes from ‘Strongly Disagree’ to ‘Strongly Agree’ on a scale from 1-10 (see Appendix A), the numerical codes were placed into Microsoft Excel to compare responses for the four groups. Next, the two-sample t-test was performed to examine the statistical differences in student body perception of the ability of RSDT to deter student-athlete drug use. According to Kim and Park (2019), a two-sample t-test has the ability to identify significant differences among comparative groups, along with having the capability to answer each research question with statistical analysis. Two separate two-sample t-tests were run for the four participant groups and data were analyzed by comparing mean survey scores. Because assumptions for the two-sample t-test were violated, the Mann-Whitney U test was implemented.

A two-sample t-test makes five assumptions (Schober & Vetter, 2019). The first required the data value to be independent. The second assumption required data from each group was obtained from a random sample. The third assumption required data from each group to be normally distributed, which failed. Additionally, the fourth assumption was not met as data values were not continuous. The fifth assumption requires the variances of each independent variable to be equal. Each of the four groupings (athletes vs non-athletes; athletes with RSDT vs athletes without RSDT) have to remain equal.

Due to the failure of the two-sample t-test to meet all assumptions, the Mann-Whitney U test was run. Birnbaum (2020) suggested to use the Mann-Whitney U test, which was the non-parametric counterpart to the two-sample t-test. According to Mircioiu and Atkinson (2017), the Mann-Whitney U test was focused on mean scores of two groups and was a better fit to evaluate statistical differences in two independent groups than the parametric counterpart. If unequal sample sizes are present among participant groups, the Mann-Whitney U test is an acceptable

test to run, to compare medians instead of means, which was the focus in the two-sample t-test (Birnbaum, 2020).

The Mann-Whitney U test required four assumptions to be met in order to run the statistical analysis (Birnbaum, 2020). Assumption one was met as the dependent variable (mean survey scores) measured on a continuous scale. The second assumption was also met due to requiring two categorical independent groups. Assumption three required independence of observations, which was met and included different participants in each of the four groups. Assumption four was met and required a determination of whether the distribution of scores for each group have the same or different shape.

Reliability and Validity

External validity was essential as it assesses whether a study has the ability to be generalized by others in the real world (Lesko et al., 2020). A high level of external validity assists in answering research questions and gives other researchers the opportunity to replicate the study (Andrade, 2018). Separate types of external validity focus on the population and ecological validity. The sample selection was 230 freshman students inside a high school administering RSDT (Andrade, 2018). This population size could utilize all grades levels (9-12) to generalize results if wanted, and increase external validity. The ecological validity of this study focuses on the survey, which can only be replicated or generalized in naturalistic situations for those who encounter drug testing (Andrade, 2018).

The survey was administered with a large population of freshman students within the present school district. This group of participants may pose a threat to external validity as the group was selected due to convenience of taking the survey (Andrade, 2018). Questions were developed for a previous drug testing research study, moreover, careful consideration was placed

in altering questions to mirror research questions (Hess, 2010). Additionally, research focused on developing a valid survey found questions centered on convergent, discriminant, and content considerations are essential to success (Fisher et al., 2016). Generating questions from a previous researcher focused on RSDT perceptions was important as parallel questions are essential for survey consistency.

The survey instrument utilized for this study was validated by consulting the chosen subject matter experts. This panel assisted through an extensive process of evaluating, eliminating, and revising survey elements. Revisions and adjustments through subject matter experts has the ability to provide credibility and dependability to the assessment (Hess, 2010). The subject matter experts reviewed the instruments for content validity. Using subject matter experts eliminated any threats to external validity as each question became more valid after experts read individual questions, took the survey as if a student, and made suggestions to improve readability. Implementing suggestions from experts in the fields of athletic training, coaching, physical therapy, and collegiate athletic administration increased the chances of a valid survey (Hess, 2010).

Survey questions were introduced to participants prior to the survey, this method could be considered a pre-test due to a threat to external validity (Aguiar, 2018). Each student did not have a paper copy of the survey; students only saw the survey on an overhead image to answer questions prior to taking the following day. These techniques generated opportunities to address survey question validity and reliability while maintaining proper alignment with the research questions.

The most current version of Microsoft Excel was utilized to assist with establishing internal consistency while engaging in the Cronbach Alpha test. Addressing internal validity

created opportunities for researchers to establish trust among readers when looking at the statistical differences in perception among participants between the variables RSDT and student-athlete drug use (Aguiar, 2018). The Cronbach Alpha test was used to assess whether the survey was a valid assessment tool (Taber, 2018). To assess the validity of the Cronbach Alpha test, the most current version of Vassar Stats was used by selecting reliability analysis and using the “alpha model” to run the output and produce a reliability coefficient (Taber, 2018). This study also used a two-sample t-test, which focused on adding reliability to the research. Due to the two-sample t-test failing to meet assumptions, a Mann-Whitney U test was used to reveal statistical differences among participant groups.

Some of the other threats to internal validity include maturation, testing, and participant selection (Aguiar, 2018). The survey procedures took place during the spring of 2021, which gave participants a total of 7-8 months of RSDT until taking the survey. This maturation could have been a threat to internal validity as each freshman participant had more experience with the process and would affect how the survey questions were answered. Participant selection could also have been a threat to internal validity as each participant was a freshman with limited or no experience with being drug tested through the RSDT process. Internal validity due to maturation may be threatened as sophomores, juniors, and seniors are not surveyed. These techniques create an opportunity to establish reliability in the gathering of survey data, along with measures to satisfy threats to external and internal validity.

Ethical Procedures

The school district in Ohio, current student-athletes, and current non-athletes are the subjects for the quantitative study. Using a quasi-experimental approach requires the researcher to remain unbiased while analyzing survey data. A researcher engaging in self-questioning and

self-understanding while creating the survey, along with adopting an unbiased nature while collecting results post survey are vital (Yates & Leggett, 2016). Properly executing norms of conduct, especially when considering ethical practice when participants are made up of minors is important (Resnik, 2011). The use of a Likert-scale decreases bias while giving limited options to choose as answers are straight forward and easily interpretable by statistical analysis methods (Maeda, 2015).

Written permission was obtained from the district (see Appendix D) and high school administration (see Appendix E) to administer the survey. District administration, parents, and students were notified the survey data were only seen by the participant taking the survey and personnel conducting the study. All data were collected, stored, and locked within the athletic director's office in a filing cabinet for three years. Only district administration had the ability to access survey results as data were available for three years. Participants were also provided a copy of the research results after data analysis concluded.

Protecting human subjects and conducting research centered on ethical standards was essential to this quantitative study (Chilton et al., 2019). Each participant, parent/guardian, and district administration was informed of the study's purpose, research questions, methodology, how data were collected/analyzed, and length of time to take the survey (see Appendices B & C). Each human subject was protected during the course of participating in this study. There was not a personal risk for each participant as names were omitted and the survey never requested for identities to be revealed (Surmiak, 2018). According to Cho and Kim (2015), research participants typically prefer to be asked for permission when participating in a study. All participation was on a volunteer basis as a decision from the parent/guardian and student (see Appendices B & C).

The survey was administered by a Health class teacher not involved in the study, to eliminate any consideration of power, along with bias persuasion to participants before the survey began (Hammer, 2017). Action was taken to keep participant privacy and confidentiality intact as data obtained was locked in a filing cabinet in the athletic director's office. The following section brings the chapter to a conclusion with a summary of the research study's methodology.

Chapter Summary

The Methodology chapter highlighted the rationale for the research design, data collection procedures, and data analysis methods for a quantitative study focused on establishing a statistically significant difference in student-athletes and non-athletes perceived effectiveness of RSDT in deterring student-athlete drug use. This chapter also detailed the purpose of the study, along with how the purpose was utilized to answer the research questions. The Research Design and Rationale section focused on how a quantitative quasi-experimental approach was appropriate and executed. The Research Procedures area identified the target population and location, methods used to study student body athletic participation and drug testing status as the independent variables, instruments used, and data collection techniques.

The Data Collection component centered on how data were prepared, gathered, and stored post-survey. Data Analysis revealed the statistical analysis software to be utilized, along with how each was implemented and used to interpret results. The Reliability and Validity section covered the instruments used to acquire and maintain trust throughout the study. The Ethical Procedures segment focused on how each participant was protected before, during, and at the conclusion of the study.

The next chapter reveals the results with regard to all research findings. Participant

survey results are revealed, along with analysis from survey data. The data disclosed was intertwined with all aspects of the quantitative study including the problem, purpose, and research questions.

Chapter 4: Research Findings and Data Analysis Results

Student-athlete alcohol and drug use has seen a steady increase for a number of years (Levy et al., 2018). According to Vito et al. (2019), participation in sport provides an opportunity for high school students to engage in social activities, which increases risks for substance use. Additional research found student-athletes to be at higher risk for substance use than students not participating in athletics (Kwan et al., 2014; Lisha & Sussman, 2010; Veliz et al., 2015). Due to the increased risk for student-athlete drug and alcohol use, this study may create a better understanding of the issue.

The problem was whether Randomized Student-Athlete Drug Testing (RSDT) decreases drug use among student-athletes. The purpose of this quasi-experimental study was to determine if a statistically significant difference existed in perceived effectiveness of RSDT in deterring student-athlete drug use. Determining statistical differences in perception took place among student-athletes versus non-athletes as well as athletes who participate in Randomized Student-Athlete Drug Testing (RSDT) versus those who do not. The following sections highlighted data collection procedures related to the sample size and time frame to complete. Data analysis examined results from participant surveys and revealed statistics to help answer research questions. Reliability and validity threats were described, along with how each was eliminated or controlled.

Data Collection

The 12-question survey consisted of a collection of student body responses toward the ability of RSDT to deter student-athlete drug use. Two-hundred thirty students in a semester Health course were targeted as potential participants for the survey. A parent letter (Informed Consent) was distributed to each Health class student two weeks before the survey to gather

permission for participation (see Appendix B). The Informed Consent letter contained the study's purpose, procedures, and explanations given to each student before taking the survey. The letter was handed out during Health class at the end of each class period in mid-April through early May.

A total of 166 out of the 230 potential students were given permission from a parent or guardian to participate in the survey. The other 64 students were opted out by parents or guardians by returning the informed consent form with "no" marked for participation, or not returning the form at all. A calculation was performed by Statistics Kingdom *a priori* to determine 158 participants would need to complete the survey to gain the power of 80% (Moston et al., 2015). Eighty percent would be considered statistically significant. After the final list of participants was collected, the informed consent forms would be stored inside a filing cabinet inside the athletic director's office for three years.

The study consisted of collecting student body responses toward the ability of RSdT to deter student-athlete drug use through a thoroughly constructed 12-question survey. A specific Health class day and time frame was allotted for participants to take the survey with five minutes built into the lesson to complete. Using only one Health class day as the time frame did not accommodate absent students. Student participants given informed consent and absent the day of the survey were not be allowed to take the survey upon returning to Health class. According to Moston et al. (2015), a participant group with more than 100 is considered statistically appropriate. One-hundred sixty-six participants would have been sufficient to show statistical significance, even with participant absences. Students were also told to not lie about responses as an honest survey is better for data.

Several specific events took place during the collection of Informed Consent forms. Each

event was addressed, fixable, and did not affect the collection of consent forms. A total of nine students' parents or guardians did not fill in the "yes/no" area of the consent form focused on participation. Each student was notified and took the consent form back to a parent/guardian to check the "yes/no" box. All nine students returned with the form signed and a box checked for 'yes' in the participation area. Another minor issue was the legibility of each printed name for the student as a potential participant. There were three students with names which were difficult to read. Unreadable names were addressed by asking questions and returning the consent form to those students to write a more legible name on the "print name" line. Each student fixed the legibility of the name and were included in the participant total.

After two weeks of collecting Informed Consent forms for research participants, the survey was given within a time frame of two days. During the first day of the allotted time frame, five minutes were utilized at the beginning of class in order allow participants to observe each question on an overhead projector. This process was to establish survey validity prior to giving the survey the following day. Students not taking the survey the next day had the option of participating in the alternative assignment focused on the current unit of study. Students were also made aware of the Child Assent Form, which was signed prior to the beginning of the survey.

The day of the survey each student having a parent or guardian signature on the Informed Consent form was given a Child Assent Form (see Appendix C). The form was created to allow each student to give personal consent before taking the survey. The child assent process took two minutes to handout, sign, and collect. Of the 166 informed consent signatures, only 158 child assent forms were signed and collected prior to taking the survey. All 158 participants also took the survey on the day given. The survey was then handed out and the duration of time to

handout, fill out, and collect was approximately seven minutes. The proposal took approximately five minutes to complete; a total of ten minutes was utilized for the child assent form and survey in total. Due to a deviation from the plan, all other students not participating in the survey took part in the optional alternative assignment for a longer period of time.

Treatment or Intervention Fidelity

A quasi-experimental design was used for the study as the two independent variables (athletic participation and RSDT participation) were not randomized. The data for the study were gathered via paper copy survey instrument. No treatment or intervention tool was necessary for the study.

Data Analysis and Results

Once the data were collected, cleaned, and imported to Microsoft Excel, data analysis were performed to investigate the differences between athletes, non-athletes, RSDT participants, and non-RSDT participants. Descriptive statistics were first calculated to highlight a basic review of data including the sum of total survey scores for each student, along with mean averages. The inferential statistics were then calculated using an Independent two-sample t-test model. The independent t-test analysis included evaluating each of the four assumptions, computing while using Microsoft Excel (2019) software and Vassar Stats (2021): Website for Statistical Computation, and interpreting the data based on each of the research questions.

Descriptive Statistics

Each of the descriptive statistics was revealed through a univariate analysis, which allowed analysis of each research question by focusing on one variable of interest (Brauchli et al., 2019). The participants (n=158) were moved into four groups consisting of athletes, non-athletes, athletes who have participated in RSDT, and athletes who have not participated in

RSDT. Table 1 shows the number of participants in each group.

Table 1

Comparison of Number of Participants per Group (Independent Variables)

Group	Number of Participants
Athlete	101
Non-Athlete	57
Athlete- RSDT Participation	62
Athlete- Non-RSDT Participation	39

Each participant answered all questions within the 12-question instrument, which was documented in Microsoft Excel. Each question gave participants options of choosing from a scale of 1-10 (1-Strong Disagree; 10- Strongly Agree). The descriptive statistics were calculated while using R to provide a preliminary review of data via graphs and numerical descriptions. Each category of independent variables (sport participation and RSDT participation) were assessed by analyzing each group participant's mean scores (athlete, non-athlete, RSDT participant, non-RSDT participant). Table 2 reveals the central tendency by calculating the mean of the survey total score, standard deviations, and sample sizes for athletes and non-athletes.

Table 2*Mean, Standard Deviation, and Sample Sizes (N) for Athletes and Non-Athletes*

Sport Participation	Mean	Standard Deviation	N
Athlete	48.21	17.95	101
Non-Athlete	42.72	15.16	57

After examining the data from Table 2, results showed athletes to have a higher sample mean composite score than non-athletes by an average difference in sample means of 5.49. These results reveal a potential difference among athletes and non-athletes in perception of the ability of RSDT to deter drug use (Research Question One). Non-athletes also revealed a lower variability score than athletes due to a lower standard deviation. Additionally, athletes nearly doubled the amount of survey participants in comparison to non-athletes.

Table 3 lists each grouping of athletes who have had RSDT and those athletes who have not had RSDT. Table 3 highlights the central tendency by calculating mean, standard deviation, and number of participants for both groups. According to composite mean scores, the perception of the ability of RSDT to deter student-athlete drug use was the highest in the Non-RSDT group by an average difference of 6.52. The results also reveal a potential difference among athletes who have participated in RSDT and athletes who have not (Research Question Two). The RSDT participant group had the highest variability according to standard deviation scores, along with 23 more participants.

Table 3

Mean, Standard Deviation, and Sample Sizes (N) for RSDT Participation and Non-RSDT Participation

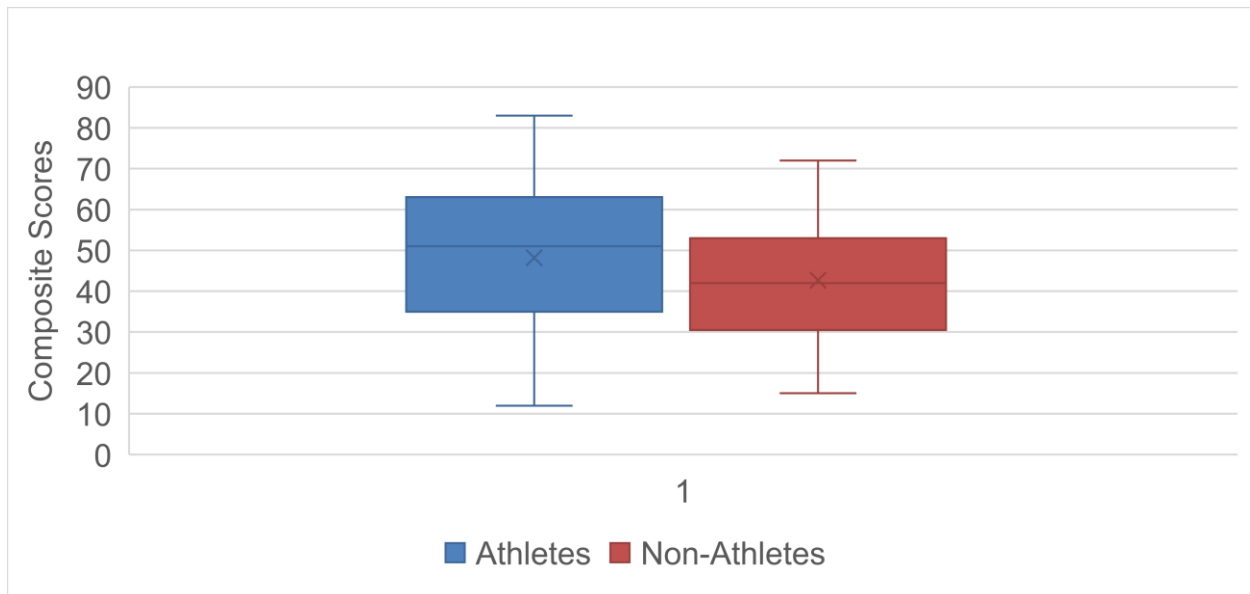
Athlete RSDT Participation	Mean	Standard Deviation	N
RSDT Participation	45.69	18.38	62
Non-RSDT Participation	52.21	16.68	39

To provide more clarity into each group's perception of the ability of RSDT to deter drug use, box and whisker plots are highlighted below for athletes, non-athletes, RSDT participants, and non-RSDT participants. Figures 1 and 2 provided a visual summary while comparing composite scores for athletes vs. non-athletes and athlete RSDT participants vs. athlete non-RSDT participants. The plots focus on highlighting the minimum value, first quartile, median, third quartile, and maximum value of a data set for each group. Box and whisker plots for Figures 1 and 2 also show similar visual results while comparing variability in each of the groups.

While looking at the box and whisker plots for median scores in Figure 1, athletes had a higher median score than non-athletes. The statistical analysis reveals athletes having a higher perception of the ability of RSDT to deter student-athlete drug use in comparison to non-athletes. The conclusion addresses the first research question.

Figure 1

Composite score comparison for Athletes and Non-Athletes (Research Question One)

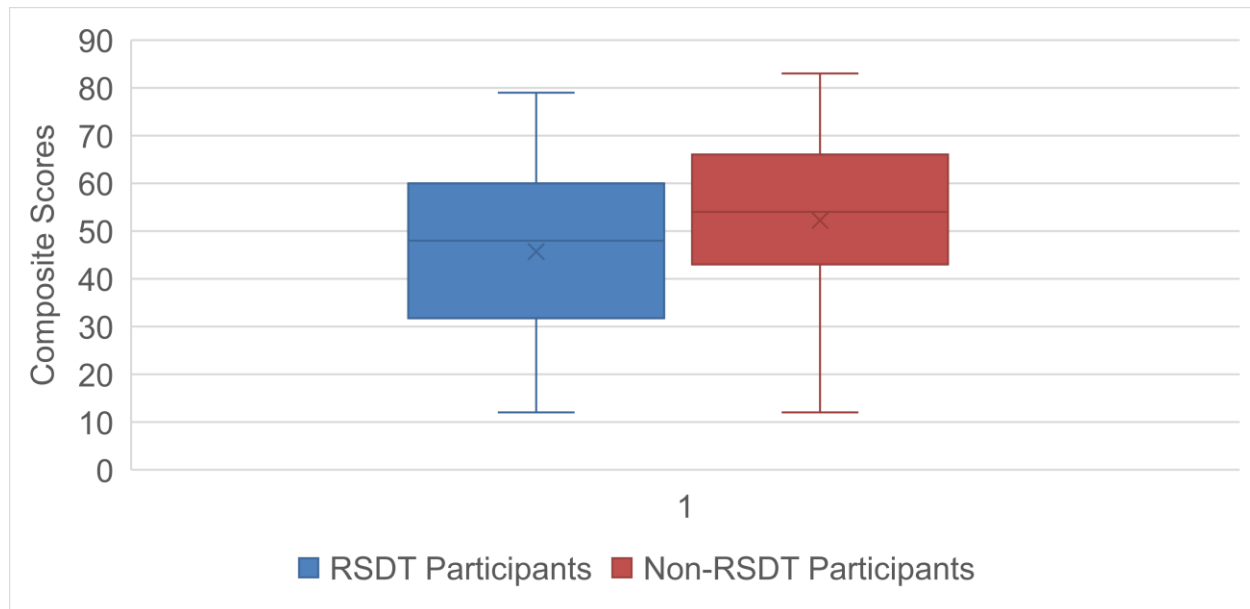


Note. Median scores reflect each group's perception toward the ability of RSDT to deter drug use.

Box and whisker plots for Figure 2 revealed athletes who had not experienced RSDT having higher median scores than athletes who had experienced RSDT. The analysis suggests athletes who have not experienced RSDT have a higher perception of the ability of RSDT to deter student-athlete drug use in comparison to athletes who have experienced RSDT. The conclusion addresses Research Question Two.

Figure 2

Composite score comparison for RSDT Participants and Non-RSDT Participants (Research Question Two)



Note. Median scores reflect each group's perception toward the ability of RSDT to deter drug use.

To investigate the difference between each set of groups further, athlete vs. non-athlete and RSDT participants vs. Non-RSDT participants, a two-sample t-test was implemented. Unlike simply comparing mean survey scores among groups, the two-sample t-test had the ability to reveal if there was a significant difference among comparative groups (Kim & Park, 2019). Based on Research Question One, the goal is to identify if mean survey scores (dependent variable) differed due to participation in sport (independent variable). The goal of Research Question Two was to identify if participant mean survey scores (dependent variable) differed due to the participation in RSDT (independent variable). Two separate two-sample t-tests were run while comparing mean survey scores for athletes vs. non-athletes and athletes who have

experienced RSDT and athletes who have not experienced RSDT.

Assumptions

When running the test for both groups, the independent variables of sport participation and RSDT participation each have two categories. Sport participation has two samples, athlete or non-athlete. Athlete RSDT participation also has two samples, RSDT participant or Non-RSDT participant. There are four required assumptions data must pass before performing a two-sample t-test to get a valid result (Schober & Vetter, 2019).

The first assumption requires the data value to be independent, meaning, the measurements for one observation do not affect measurements for another observation. The survey data met this assumption as mean scores for one category did not affect mean scores for the other category while performing separate two-sample t-tests. Athletes mean scores did not affect measurements for Non-athletes, and mean scores for RSDT participants did not affect mean scores for Non-RSDT participants. The second assumption was met as each group obtained a random sample from the population. The third assumption required data in each group to be normally distributed. This assumption was violated due to having a Likert-scale survey as a survey instrument. The fourth assumption required data to be continuous and was also violated.

According to Mircioiu and Atkinson (2017), Likert-scale data is intrinsically ordinal and values are bound right and left, therefore, populations do not have a normal distribution.

Birnbaum (2020) suggested using a non-parametric testing option such as the Mann-Whitney U test. The Mann-Whitney U test was the non-parametric counterpart for the two-sample t-test when comparing mean scores of two groups (Birnbaum, 2020). Additionally, Mircioiu and Atkinson (2017) found a Mann-Whitney U test to be a better fit for evaluating differences in two independent groups than a parametric counterpart as medians are evaluated instead of means.

The Mann-Whitney U test not only uses ordinal data and data is not normally distributed, but running a test for unequal sample sizes is acceptable, which were present in the survey.

The Mann-Whitney U test requires four assumptions are met before implementing. The first three focus on the study's design and the last relates to the nature of data. Assumption one was met due to the dependent variable (mean survey scores) measuring on a continuous scale, which measures on a scale of 0-120 (ordinal data). The second assumption requires each independent variable to consist of two categorical independent groups. Both independent variables, sport participation and RSDT participation, have two categorical groups (Sport Participation, Athlete or Non-Athlete; Athlete RSDT Participation, Yes or No) to meet this assumption. Assumption three states there should be independence of observations, meaning, there must be different participants in each of the four groups. This assumption was met as two separate Mann-Whitney U tests are being performed for each category of sport participation and RSDT participation. Neither group for each category was present in the other group (Athletes vs. Non-Athletes and RSDT participant vs. Non-RSDT participant).

Assumption four requires a determination of whether the distribution of scores for each group of independent variables have the same or different shape. This assumption required a look at mean data while comparing each of the groups within both categories of athletic participation and RSDT participation. This determination of shape allows for proper interpretation of results (Birnbbaum, 2020). The assumption was met as box and whisker plots (Figures 1 and 2) provide a graphical summary of distribution, which reveal a similar shape.

The goal of the Mann-Whitney U test was to determine if the difference between the median scores for each of the categorical groups was statistically significant (athletes vs. non-athletes and RSDT participants and Non-RSDT participants). Table 4 reveals results from Vassar

Stats while utilizing the Mann-Whitney U Test. The table describes already known data such as the mean and standard deviation, along with the Z-value and p-value from Vassar Stats analysis.

By including this analysis combination there was room for interpretation by comparing mean and median scores for athletes and non-athletes to answer Research Question One.

Table 4

Mean, Standard Deviation, Z-value, and p-value for Athletes and Non-Athletes

Athletic Participation	Mean	Standard Deviation	Z	p
Athlete	48.21	17.95	2.18	0.0293**
Non-Athlete	42.72	15.16		

**p < .05.

A Mann-Whitney U test was conducted to quantify the statistical differences between the two groups within athletic participation, athlete and non-athlete. The goal was to determine if a statistically significant difference exists in perception of the ability of RSDT to deter drug use. The mean and standard deviation scores were higher in athletes, which indicated a higher perception of RSDT effectiveness in deterring drug use. The mean scores did not necessarily reveal sport participation as an indicator for a statistical difference among athletes and non-athletes in perception of RSDT effectiveness. The Mann-Whitney U test revealed a p-value less than .05 (p=.0293), which indicated the p-value was less than the significance level. Due to p < .05, the null hypothesis was rejected and the difference between athletes and non-athletes' medians was statistically significant. Sport participation revealed a statistically significant

difference in perception between athletes and non-athletes as the alternative hypothesis was accepted.

Table 5 also revealed results from Vassar Stats while utilizing the Mann-Whitney U Test. The table revealed the two groups of 'RSDT participant and Non-RSDT participant' derived from the category 'Athletic RSDT Participation.' The table includes already known data such as the mean and standard deviation, along with the Z-value and p-value from Vassar Stats analysis. Mean and median score comparisons are included within Table 5, which assisted in answering Research Question Two.

Table 5

Mean, Standard Deviation, Z-value, and p-value for RSDT Participation and Non-RSDT Participation

Athlete RSDT Participation	Mean	Standard Deviation	Z	p
RSDT Participation	45.69	18.38	-1.63	0.1031
Non-RSDT Participation	52.21	16.68		

**p < .05.

The goal was to determine if a statistically significant difference exists in perception of the ability of RSDT to deter drug use between athletes who have experience with RSDT vs. athletes who have not had experience with RSDT. The mean scores were higher in athletes who had not experienced RSDT than those who had, which indicated a higher perception of RSDT effectiveness in deterring drug use. The mean scores did not necessarily reveal RSDT as an

indicator for a statistical difference among RSDT athletes and non-RSDT athletes in perception of RSDT effectiveness. The Mann-Whitney U test did reveal a p-value more than .05 ($p=.1031$), which indicated the p-value was greater than the significance level. Due to $p > .05$, there was a failure to reject the null hypothesis and the difference between RSDT athletes and non-RSDT athletes' medians was not statistically significant. RSDT participation did not reveal a statistically significant difference in perception between RSDT athletes and non-RSDT athletes.

Reliability and Validity

Eliminating threats to external validity are essential as others are able to generalize the study in the future (Lesko et al., 2020). Answering research questions creates confidence in other researchers replicating the study (Andrade, 2018). External validity with regard to population was controlled with a large sample selection of 158 freshman students completing the survey out of a potential 230 participants. To increase external validity, the study could use grades 9-12 if needed to generalize results. From an ecological standpoint, the survey itself can be generalized in naturalistic scenarios, as long as drug testing was present (Andrade, 2018).

The survey was given credibility as questions were derived from a previous drug testing research study (Hess, 2010). Careful consideration was given to the previous survey to create parallel questions while considering convergent, discriminant, and content while developing consistency (Fisher et al., 2016). Additionally, subject matter experts were utilized for extra credibility and dependability, which aided in developing the survey through multiple evaluations and revisions. External validity was controlled as the subject matter experts not only evaluated the survey, each member assisted in revising each individual question and took the survey multiple times as if a student before the survey was administered. Experts in the fields of athletic training, coaching, physical therapy, and collegiate athletic administration also assisted in

creating a valid survey before administering.

Prior to administering the survey, questions were introduced to the participants to eliminate potential confusion and create understanding toward each question. According to Aguiar (2018), an introduction to a survey or assessment prior to taking the survey or assessment could be considered a pre-test, which helps to control external validity. Creating this environment to discuss and ask questions about the survey generated opportunities to address individual question reliability and maintain research question alignment.

Internal validity threats included administering the survey during the spring of 2021, which gave participants 7-8 months of possible RSDT experience before taking the survey. The more experience a freshman student had with RSDT, the more possibility survey questions were answered in a specific manner. Additionally, students with no experience with RSDT may answer in a specific manner. These threats to internal validity were controlled by putting the survey through a Cronbach Alpha test for internal consistency. According to Taber (2018), using the most current version of statistical software to test the survey is important in creating a valid assessment tool. The Cronbach Alpha results reached a level above 70% consistency (.712) as reliability analysis was utilized within the most current version of Microsoft Excel to produce the reliability coefficient (Taber, 2018). Additionally, internal reliability was controlled by testing mean survey scores by way of a two-sample t-test, followed by the Mann-Whitney U test due to violations of t-test assumptions.

Chapter Summary

The results were revealed by specifying data collection procedures through the administered survey. The original methodology plan was utilized with certain variations to answer each research question. Each research question examined survey scores for statistical

differences among four groups (athlete vs. non-athlete; RSDT participant vs. Non-RSDT participant) derived from two categories (sport participation and athlete RSDT participation). The first research question focused on examining a statistically significant difference among athletes and non-athletes in perception of the ability of RSDT to deter drug use. The mean scores were higher for athletes than non-athletes, which revealed a higher perception of the ability of RSDT to deter drug use. The second research question focused on examining a statistically significant difference among athletes who participated in RSDT vs. athletes who did not participate in RSDT. The mean scores for Non-RSDT participants was higher than RSDT participants, which revealed a higher perception of the ability of RSDT to deter drug use.

Microsoft Excel allowed for researching mean score differences, but lacked the ability to examine statistical differences among the four groups. The two-sample t-test was first performed until failing to meet all assumptions to administer the statistical analysis. Due to a failure of assumptions, the statistical counterpart of the two-sample t-test was enacted, the Mann-Whitney U test. The Mann-Whitney U test revealed $p < .05$ ($p = .0293$) for Research Question One as the alternative hypothesis was accepted. Sport participation does reveal a statistically significant difference in perception between athletes and non-athletes. The Mann-Whitney U test also revealed $p > .05$ ($p = .1031$) for Research Question Two as there was a failure to reject the null hypothesis. Drug testing participation does not reveal a statistically significant difference in perception between athletes who have experienced RSDT and athletes who have not.

The next chapter will provide discussion by examining the statistical results. Conclusions based on data will be articulated while also providing limitations to the study. Discussion will center on recommendations for research moving forward and the importance of other researchers replicating the study in the future.

Chapter 5: Discussion and Conclusion

The purpose of this quasi-experimental study was to determine if a statistically significant difference existed in perceived effectiveness of RSDT in deterring student-athlete drug use. Determining statistical differences in perception took place among student-athletes versus non-athletes as well as athletes who participate in Randomized Student-Athlete Drug Testing (RSDT) versus those who do not. The focus of the study was to evaluate perceptions of the four groups (athletes vs non-athletes; athlete RSDT participants vs athlete non-RSDT participants) by utilizing a 12-question Likert-scale survey. Mean survey scores were compared for each of the four groups to determine if a statistically significant difference was present. If a statistically significant difference was found across athletes and non-athletes, results would suggest sport participation affects perception in RSDT deterring drug use. If a statistically significant difference was found across athlete RSDT participants and athlete non-RSDT participants, results would suggest RSDT participation affects perception in RSDT deterring drug use.

The significance of this study was to add to the previous knowledge of RSDT effectiveness in deterring drug use and further inform a school district's decision to implement RSDT. Having an opportunity to decrease student-athlete drug use in an educational setting has the ability to increase present academic and athletic success, which may create future opportunities. RSDT is a method to facilitate the decrease in drug use and manifest an optimal experience for all student-athletes. Addressing the issue of drug use across four groups (athletes, non-athletes, athlete RSDT participants, athlete non-RSDT participants) would help school district administrators make an informed decision about whether to implement an RSDT program. The research would assist in building on knowledge concerning RSDT effectiveness in deterring drug use.

The primary focus for this study was to address two research questions. Research Question One and Two guided the methodology and data analysis. Research Question One focused on analyzing if there was statistically significant difference between sport participation (athletes vs. non-athletes in RSDT perception in deterring drug use. Research Question Two focused on analyzing if there was a statistically significant difference between sport participation (athletes who've had RSDT vs. those who have not) in RSDT perception in deterring drug use. A quantitative methodology was used for the study to address the research questions concerning statistically significant differences among athletes vs non-athletes, along with athlete RSDT participants vs athlete non-RSDT participants in RSDT perception in deterring drug use. Based on the results, student-athletes perceived RSDT to deter drug use differently than non-athletes. Athletes who have experienced RSDT did not perceive RSDT to deter drug use differently than those athletes who have not experienced RSDT.

This chapter consisted of areas focused on drawing conclusions from the statistical analysis performed for each research question. The goal was to provide clarity in interpreting data, presenting conclusions, describing limits, and the overall impact of the study on positive social change. The section headings include Findings, Interpretations, and Conclusions, Limitations, Recommendations, and Implications for Leadership.

Findings, Interpretations, and Conclusions

The findings, interpretations, and conclusions section focused on revealing a comparison between this study's results and prior research related to student body perception of RSDT effectiveness in deterring drug use. Specifically, previous research related to perception of athletes, non-athletes, and athletes who have experienced RSDT were also compared. Differentiating research was followed by connecting the Theory of Reasoned Action (TRA) and

the Theory of Planned Behavior (TPB) with the implications of the findings. TRA and TPB complemented each other while creating reasoning for student-athlete engagement in drug use, which manifested further implications centered around the study's results.

Comparison of Previous Research

Previous research revealed mixed results in terms of RSDT deterring student-athlete drug use. Research proved inconsistent in RSDT deterring drug use for the most commonly used substances for student-athletes in a high school setting, alcohol and marijuana (Bahrke, 2015; Levine et al., 2017; Terry-McElrath et al., 2013). This study added to previous research because student body perspective toward the ability of RSDT to deter drug use potentially creates further reasoning for a school district to implement drug testing. Previous research found very little information related to student body perspective on RSDT (Kushnir et al., 2018; Peretti-Watel et al., 2019). The comparison lies with previous results showing student body perception of RSDT effectiveness in deterring drug use being inconsistent (Bahrke, 2015; Levine et al., 2017; Terry-McElrath et al., 2013). Comparing this study with previous results also focused on examples with large sample sizes similar to the number of participants used for this research.

This study's results were compared with multiple organizations' RSDT results, which focused on student body perception of RSDT effectiveness. When interpreting the results for Research Question One, athletes revealed a propensity to stay away from drug use while playing a sport. Survey results showed athletes were more fearful of a failed drug test and potentially losing the opportunity to play a sport than non-athletes. When interpreting data for Research Question Two, research revealed athletes who have not experienced RSDT were more likely to stay away from drug use than athletes who have been drug tested. Survey results showed athletes who have not experienced RSDT were more fearful of a failed drug test and potentially losing

the opportunity to play a sport than athletes who have experienced RSDT. The majority of previous studies utilized large sample sizes similar to this study's number of participants (Kushnir et al., 2018; Kwan et al., 2014; Peretti-Watel et al., 2019; Schmidt et al., 2016; Terry-McElrath et al., 2013).

The inconsistency of each large study revealed a mix of decreases, increases, or no change in deterring drug use. Plotnikoff et al. (2019) compiled numerous studies for a meta-analysis and found RSDT to provide no change in decreasing alcohol or drug use. Ludkte (2011) also conducted a two-year study for RSDT for collegiate athletes. Research revealed an increase in drug use among student-athletes within the first six months of the study (Ludkte, 2011). Additionally, Stockings et al. (2016) found RSDT results had a limited effect on deterring alcohol use and no effect on limiting marijuana and illicit drugs among student-athletes.

Deterring drug use among organizations using RSDT also showed promise. A study completed by Peretti-Watel et al. (2019) found RSDT to completely stop drug use among a large majority of high school athletes. Kwan et al. (2014) also found 80% of participants in a large RSDT study decreased illicit drug use. Kushnir et al. (2018) also found significant decreases in drug use within the first six months of the study. A 14,000 participant RSDT study was utilized and concluded RSDT was the only consistent method to decrease student-athlete drug use. Similar to the large participant group in this study, Terry-McElrath et al. (2013) concluded research results produced more accuracy with larger sample sizes.

Based on the previous RSDT testing results inconsistencies, the statistical analysis answering the first and second research questions was important to extend knowledge of RSDT effectiveness in deterring drug use. According to this study's survey results, athletes perceive RSDT as a deterrent to decrease drug use over non-athletes. Additionally, athletes who have not

experienced RSDT perceive drug testing to deter drug use over athletes who have experienced RSDT.

When comparing direct perception of each of the four groups (athletes, non-athletes, athlete RSDT participants, and athlete non-RSDT participants), previous research revealed non-athletes perceived RSDT would not deter student-athlete drug use (Russell et al., 2005). Based on the results for Research Question One, sport participation revealed a statistically significant difference in perception. If a student participates in athletics, the athlete was more likely to perceive RSDT as an effective deterrent of drug use, which was aligned with previous research. Additionally, Russell et al. (2005) found student-athletes not subjected to RSDT were apprehensive about using drugs due to testing more than athletes who have been drug tested. These results align with the results for Research Question Two as athletes not experiencing RSDT are more likely to perceive RSDT as a drug use deterrent, in comparison to RSDT participants. According to mean and median results, if an athlete has not been drug tested, the athlete was more likely to feel drug testing decreases drug use. If an athletic participant has been drug tested, the athlete was more likely to feel RSDT does not decrease drug use.

Connecting Theoretical Framework with Implications

This study was informed by the Theory of Reasoned Action (TRA) and the Theory of Planned Behavior (TPB), which focus on behavioral intention instead of actual behaviors being placed into action (Hagger, 2019). TRA and TPB assisted in answering each research question by ushering the study's goal of determining statistical differences in perception among groups. TRA and TPB helped determine perception by analyzing a student's personal attitude and norms (Hagger, 2019). Each theory was supported by not only potential reasoning as to why a student-

athlete may engage in the act of drug use, but also if sport participation and RSDT participation are factors influencing perception of RSDT effectiveness in deterring drug use.

According to Kautonen et al. (2015), TRA and TPB revealed the greatest predictor of behavior to be intention. Previous research found student-athletes to be high risk for drug use, TRA and TPB create an avenue to predict intention of student-athletes, which was revealed through this study's survey results (Montano & Kasprzyk, 2015). The mean survey scores for each group showed a form of behavioral intention by revealing who perceived RSDT to deter drug testing the most. The mean and median survey scores directly answered each research question as results revealed if sport participation (Research Question One) and RSDT participation (Research Question Two) are factors influencing the way each group perceives RSDT effectiveness in deterring drug use. TRA and TPB created a frame for why each of the four participant groups perceived RSDT effectiveness in deterring drug use differently. Each theory also created potential reasoning why statistical significance did or did not occur based on sport and RSDT participation.

According to survey scores and the first research question, athletes perceived RSDT to deter drug use more so than non-athletes. Kristiansen (2017) found student-athletes in pursuit of high levels of academics and athletics experience high stress levels, which in turn, makes this group more susceptible to drug use. Blustein (2017) also concluded athletes hold personal popularity at a high level, which makes this group more susceptible to heavy alcohol use than non-athletes. Hagger et al. (2018) found TRA to be a factor in determining future health behaviors, which may be reasoning for athletes mean scores to be higher than non-athletes. Meaning, pressure to conform within a group and perform academically and athletically generate reasoning why mean scores were higher. Additionally, median survey scores determined the

differences between athletes and non-athletes were statistically significant. Based on previous TRA and TPB research in terms of predicting future behaviors, this difference signified sport participation was a factor in perception of RSDT effectiveness on drug use.

According to survey scores and the second research question, athletes who have not experienced RSDT perceived RSDT to deter drug use more than athletes who have experienced RSDT. Additionally, the differences in survey scores between each group (athlete RSDT participants and athlete non-RSDT participants) were not statistically significant. Cooke et al. (2016) found adolescent intention to engage in drug use to be motivated by attitude, norms, and behavior control. TPB assisted students in making decisions and processing consequences of those decisions focused on drug use (Zemore & Ajzen, 2014). As athletes who have not experienced RSDT perceive drug testing to deter drug use more than athletes who have experienced RSDT, and differences in perception were not statistically significant, TRA and TPB may offer an explanation. Athletes who plan behaviors based on potential outcomes of actions may be more likely to perceive RSDT as a drug use deterrent due to consequences of decisions.

Given the mean survey scores and results for both research questions, each group's perception of RSDT effectiveness may come from six areas. TRA and TPB propose perception to derive from attitude, behavioral intention, subjective norms, social norms, perceived power, and perceived behavioral control (Ajzen, 2015). TRA and TPB can not only help predict how a student body perceives RSDT effectiveness in deterring drug use, but what motivates a student-athlete to engage or deter from actually using drugs.

Limitations

All of the participants for this study were freshman and members of a Health class. Due to these circumstances, generalizability and external validity may be difficult as each participant was part of the same age group and course (Andrade, 2018). If the survey were given to different age groups the results might have produced a different outcome. Additionally, if a different course were chosen, different numbers for each group would have occurred, which in turn may have produced different survey results. A limitation to the quasi-experimental design in general focused on the inability to determine causation between athletes who have experienced RSDT with athletes who have not experienced RSDT and perception of RSDT effectiveness.

The external and ecological validity focused on the population for the study, which has the ability to be replicated by others away from this study (Lesko et al., 2020). The sample selection was a large group of 230 freshman Health class students. The sample size could be a limitation to the study, especially if the number of participants completing the survey was low enough to decrease the power of the survey. To counter for this potential limitation, the sample size a priori found the number of participants (158) gains the power of 80% if everyone completed the survey (Moston et al., 2015). A participant number of more than 100 created a lower margin for error and was still considered significant in terms of acquiring values for mean and median (Heidel, 2016). Because of the larger sample sizes for each of the four groups, any bias for non-responses was likely minimal. The survey was also given to only one group of freshmen within one semester. If another semester were chosen, the result would have likely been different.

The survey as an instrument for the study posed a limitation to the study as well. The survey was evaluated and revised multiple times by using subject matter experts to provide

credibility and dependability (Hess, 2010). The subject matter experts (SME) eliminated threats to external validity as the panel brought suggestions from the fields of athletic training, coaching, physical therapy, and collegiate athletic administration. Certain members of the SME also provided personal perceptions about how the target student body may feel about RSDT. These thoughts were evaluated and considered to aid in creating a validated survey. Feedback was not available through documentation, but conversations with the SME each step of the way occurred to create a valid survey for participants. In the future, gathering documentation from the SME would be a part of the survey process to generate further validity.

As the survey was introduced to the SME, a series of drafts and revisions were required before administering in the Health courses. The first step in the process focused on gathering feedback through conversation from the panel after looking at the initial researcher-developed survey. After initial adjustments were made to the survey, the next step was to have the SME take the survey as a student would. Each expert was asked to give verbal feedback for how the questions could be improved for clarity purposes. The goal was to utilize an expert team to create a survey acclimated to fit each of the research questions while generating unbiased and clearly written questions.

Giving the survey to a student body also required an establishment of internal consistency, which could be a limitation to the study. An audience needs to establish trust while looking at statistical difference in perception of RSDT effectiveness among groups (Aguiar, 2018). The Cronbach Alpha test was utilized to assess the validity of the survey as an assessment tool (Taber, 2018). Cronbach Alpha results reached .712 as a reliability coefficient, which requires a survey to reach 70% or higher consistency. Additional limitations to internal validity focused on giving the survey in the spring of 2021, which gave participants 7-8 months of RSDT

until taking the survey. As freshman participants have more experience with the process, this survey could affect results. Sophomores, juniors, and seniors are not surveyed, which also posed a threat to internal validity.

Recommendations

Based on the results from the first research question, other school districts should consider RSDT implementation. Because a statistically significant difference was found and sport participation revealed itself as a reason to deter from drug use, school district administrators should consider adding RSDT to a curriculum. Administrators in a school district should apply RSDT into an athletic curriculum, which could not only deter present student-athlete drug use, but facilitate consistency in life-long decision-making pertaining to drug use (Schmidt et al., 2016).

Members of a school district contemplating a decision to implement RSDT should consider replicating this study. School district administrators can replicate and even slightly tweak the survey to determine if mean scores show student perception of RSDT effectiveness in deterring drug use. The survey can be given at the beginning of a school year as well as at the end to formulate a comparison. If RSDT has been implemented and a school district is uncertain whether to continue with the program, a longitudinal study should be conducted. Longitudinal research while using the study's survey can solidify the validity of RSDT as the Theory of Reasoned Action (TRA) and the Theory of Planned Behavior (TPB) may come to fruition in not only predicting student-athlete perception, but also engagement in drug use.

Based on the results of the second research question, other school districts should consider RSDT implementation. If RSDT occurs in a district, gathering perspectives from student-athletes who have not experienced drug testing might be beneficial research to justify the

purchase of RSDT. Although Research Question Two revealed previous drug testing participation did not necessarily deter drug use, because each participant in the two groups (athlete RSDT participants and athlete non-RSDT participants) were athletic participants, administrators in a district should consider RSDT implementation into an athletic program.

If a school district is to implement an RSDT program, all stakeholders should be informed of the process. Multiple student-athlete and parent meetings should occur to eliminate not only bias toward RSDT, but also to educate families prior to the beginning of a student's athletic career. These meetings should highlight how the RSDT process works with regard to execution time, expectations from the student and drug testing administrators, and speediness of results. According to Rathbun (2011), drug testing implementation not welcome into a school district is typically due to a lack of communication with stakeholders and parents. Informing parents ahead of implementation significantly increases the chances of RSDT acceptance into a community (Hadland & Levy, 2016).

To increase student-athlete perception of RSDT effectiveness, school districts should implement stern consequences for positive (failed) drug tests. Initial meetings with parents, community members, and stakeholders regarding RSDT implementation should highlight specific punishments for positive test results. According to Rathbun (2011), parental understanding of how and why RSDT is necessary assists a school district in decreasing drug use because parents become assets. Punishments are more understood and accepted by student-athletes as parents become an extension of the district's RSDT plan. Chan et al. (2017) found parental approval of RSDT and disapproval of drug use to be associated with reducing drug use.

Another recommendation to earn parental and community trust in the RSDT process is having a plan for when a student-athlete tests positive. Consequences involving missing athletic

contests or time away from a team is necessary, but educating students after a positive test can significantly reduce the chances of future positive tests (Newton et al., 2018). Vadrucci et al. (2016) found drug prevention education (DPE) programs to increase a student-athlete's cognitive ability to cope with stress and make decisions regarding drug use. The recommendation to enact a DPE program for all positive testers has the power to add reliability to the RSDT process as an extra step to reduce drug use is being taken. According to Botvin et al. (1995), a combination of RSDT and DPE programs can significantly reduce drug use for a student body.

The recommendations of increasing parent and community stakeholder informative meetings, implementing stern consequences, and inserting DPE programs may decrease student-athlete drug use. A further recommendation is to survey different age groups, genders, and even specific sports to get a stronger sense of student-athlete perception of RSDT effectiveness. This study only focused on freshmen enrolled in a Health course. Each freshman participant had limited exposure to RSDT in terms of time enrolled in high school. Using groups of upper classmen might reveal a more experienced perspective on how a student body perceives RSDT to effectiveness. With regard to each research question, these recommendations might also increase student-athlete perception of RSDT effectiveness in deterring drug use, which in turn, have the power to decrease drug use.

Implications for Leadership

There are numerous elements to assist in a school district's decision to implement RSDT based on this study's data analysis results. One of the hurdles for a school district is gathering support from the community and stakeholders when implementing RSDT (Hadland & Levy, 2016; Rathbun, 2011). Administrative leaders within a district can utilize this study to place focus on student feedback and perspective. Gathering perspective with regard to how student-

athletes feel about RSDT might create a positive attitude toward drug testing from the community (Hadland & Levy, 2016). Stakeholder acceptance of RSDT implementation not only generates a better chance of success, but builds trust between administrators, the community, and the student body.

Given the concern to establish RSDT success for many years, district administrators might want to gather perspective from student-athletes each year. Administrators might be able to use this feedback to make alterations to the RSDT process to improve protocols. Leaders may also ask for feedback from the community and stakeholders throughout the years to make additional improvements. From a societal relations standpoint, gathering of feedback about RSDT policies and protocol can also improve relationships and mutual respect among administration and community members.

Previous literature has not only shown a decrease in student-athlete drug use in the beginning of a research study, but follow-ups with subjects revealed an increase in a participant's ability to abstain from drug use in adult life (Kushnir et al., 2018; Stockings et al., 2016). Although previous research showed an inconsistent trend in decreasing drug use, this study revealed sport participation as reasoning for a student to deter from drug use. Administrative leaders might want to make changes to the survey questions and even follow-up with graduates to gather another perspective. The survey used in this research study can be completed after high school years, along with questions regarding drug use after graduation. If district administrators can successfully implement an RSDT program, the chances of a student using drugs after high school and into adult life tend to decrease (Montano & Kasprzyk, 2015). This type of statistical data might add justification as to why RSDT plays an important role in the student-athlete experience in the present, along with future success.

A district's introduction to RSDT into an athletic program creates an opportunity to utilize the Theory of Reasoned Action (TRA) and the Theory of Planned Behavior (TPB) for the good of each student-athlete. TRA and TPB focus on behavioral intention instead of actual behaviors and actions (Hagger, 2019). The greatest predictor of behavioral action is intention, which is the fuel for a student-athlete to engage or abstain from drug use (Kautonen et al., 2015). If an RSDT program is implemented, a student-athlete now must consider reasoning for why using drugs or alcohol is a risk. According to this study's data, sport participation was considered a good reason to not engage in drug use.

Based on previous research, school districts are reluctant to survey student-athletes to gather feedback regarding drug testing. This study used a student body and results provided motivation to consider RSDT implementation, but there is also a possibility to use the survey to evaluate and even share perception results. This study also gave justification for administrators to use the survey as a tool to evaluate present and future perception from not only student-athletes, but stakeholders as well. The survey tool can also be used to evaluate student-athletes after graduating and into adult years. Administrator encouragement for students to play sports generates a goal for a student-athlete, sense of belonging to a team, and a feeling of accountability and dependability to others (Hagger, 2019; Tuck & Riley, 2017). Administrator involvement of stakeholder and student-athlete perspective of RSDT assists in improving community relations, which creates support of RSDT. Decreasing drug use in the present has the wherewithal to improve health and wellness of each student-athlete not only in the present, but the future.

Conclusion

The study included statistical differences in perception of RSDT effectiveness between two sets of groups (athletes vs non-athletes and athlete RSDT participants and athlete non-RSDT participants). The significance of the study was to inform a school district's decision to implement RSDT, which may decrease student-athlete drug use. The study's survey results determined there was a statistically significant difference between athletes and non-athletes in RSDT perception in deterring drug use. Additionally, survey results revealed there was not a statistically significant difference between athletes who have had RSDT and athletes who have not. The study was based on the Theory of Reasoned Action (TRA) (Ajzen, 2015) and the Theory of Planned Behavior (TPB) (Yzer, 2017), each provided the frame for the study. The statistical results of this study were compared to similar research studies.

Because there was a statistically significant difference in perception due to sport participation (Research Question One), playing athletics was interpreted to potentially decrease student-athlete drug use. Because statistically significant differences were not found in perception due to RSDT participation (Research Question Two), athletes who have not been drug tested were interpreted to understand consequences for positive test results and may deter from drug use. Additionally, mean survey scores were also evaluated for each of the four groups (athletes, non-athletes, athlete RSDT participants, athlete non-RSDT participants). Results revealed athletes perceived RSDT to be effective more than non-athletes, and non-RSDT participants perceived RSDT to be effective more than athlete RSDT participants.

When administrators at a school district consider implementation, informing parents and stakeholders about the RSDT process important. Research has shown communication for testing protocol, how results are revealed and to whom, and consequences for failed tests to be

successful in terms of implementation (Chan et al., 2017). Additional reinforcement for deterring student-athlete drug use can be found in Drug Prevention Education (DPE) programs. DPE programs serve not only student-athletes who test positive, but potentially coexisting with RSDT for all student-athletes (Botvin et al., 1995). Utilizing other independent variables and surveying different age groups, genders, and even specific sports to get a stronger idea of student-athlete perception of RSDT effectiveness might assist in combating drug use. Due to this study's results, drug testing for the entire student body, not just student-athletes, may have a positive effect. Specific limitations included the number of participants meeting the power of 80% to sustain external validity (Moston et al., 2015), along with the survey challenge to internal validity being met by a Cronbach alpha score of over 70% for a reliability coefficient.

This study was utilized to reach a goal of facilitating the consideration of RSDT implementation among school districts. Understanding the perceptions of a student body in terms of the ability of RSDT to deter drug use is valuable in maximizing a student's experience academically and athletically. Promoting RSDT as a drug use deterrent may help student-athletes become more successful in present and future times.

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Appendix A

Likert-Scale RSDT Survey

Please answer the following questions:

Gender (circle one):

Male Female

Do you participate in sports? (circle one):

Yes No

If so, which sport(s):

Have you participated in Randomized Drug Screening at the high school? (circle one)

Yes No

Use the scale to answer the following questions about drug and alcohol use at your high school:

1) Strongly Disagree

10) Strongly Agree

1. There are student-athletes at school who use drugs or alcohol.

1 2 3 4 5 6 7 8 9 10

2. There are student-athletes at school who abuse drugs or alcohol.

1 2 3 4 5 6 7 8 9 10

3. Randomized Student-Athlete Drug Testing decreases alcohol and drug use among student-athletes.

1 2 3 4 5 6 7 8 9 10

4. Randomized Student-Athlete Drug Testing does NOT decrease alcohol and drug use among student-athletes.

1 2 3 4 5 6 7 8 9 10

5. Randomized Student-Athlete Drug Testing is helpful for students who are deciding whether or not to use alcohol.

1 2 3 4 5 6 7 8 9 10

6. I would not participate in extra-curricular activities and athletics if I had to submit to a random drug test in order to participate.

1 2 3 4 5 6 7 8 9 10

7. Randomized Student-Athlete Drug Testing will deter students from doing drugs and drinking alcohol.

1 2 3 4 5 6 7 8 9 10

8. Randomized Student-Athlete Drug Testing will NOT deter students from doing drugs and drinking alcohol.

1 2 3 4 5 6 7 8 9 10

9. Students who participate in athletics and extracurricular activities should be randomly drug tested.

1 2 3 4 5 6 7 8 9 10

10. Students who participate in athletics and extracurricular activities should NOT be forced to participate in randomized drug testing.

1 2 3 4 5 6 7 8 9 10

11. Randomized Student-Athlete Drug Testing has decreased the likelihood that I participate in drug use.

1 2 3 4 5 6 7 8 9 10

12. If Randomized Student-Athlete Drug Testing was not implemented at my school, it is likely I would participate in drug use.

1 2 3 4 5 6 7 8 9 10

Appendix B

Informed Consent for Research Participants

Study Title: Student-Athlete Drug Deterrence and Impact of Screening: A Quasi-Experimental Study

Research Investigator: Drew Mohr, [REDACTED] S&C Coach; HPE Teacher, [REDACTED] Schools

Contact information:

Office: (740) 657-4287

Email: [REDACTED]

Location: [REDACTED], [REDACTED], Health Room 1507/1509

What is this research about? We would like your child to participate in a research study about the effects of Randomized Drug Testing on student-athlete drug use. This portion of the study focuses on a 12-question survey to help gather student body perceptions toward randomized drug testing. Your child can ask a question at any time and they can stop participation at any time. We require a parental signature for your child to participate in the study, however, each participant has the choice to opt out at any time.

What will happen to your child in this research? Your child will be given a 12-question survey to assess their feelings in three different areas; 1) student-athlete drug use; 2) randomized drug testing increasing or decreasing drug use; 3) participation in athletics with the presence of randomized drug testing; your child will complete the 12 question survey using a paper and pencil. All survey questions are available for parent/guardians to view upon request.

How long will it take for your child to participate in the study? The testing will be completed within one 45-minute class period with the survey taking roughly 5-10 minutes.

What are the risks associated with participating in this study? We believe there are no known risks.

What are the benefits? The data from this study potentially has the power to motivate other school districts to implement Randomized Student-Athlete Drug Testing.

Does your child have other choices? Your child may choose not to participate in this survey at any time.

Will anyone know my child is participating in the research? As a participant, your child's name will be kept confidential from anyone not participating in the research study. Additionally, your child is not required to place his/her name on the survey before answering the questions. Whether your child chooses to place his/her name on the survey, all names are omitted from survey results.

Will your child be paid? No.

Who can I talk to about the research? You may contact Mr. Mohr.

What if your child does not want to do this? Your child does not have to be in this research study. Your child can say no at any time. No one will be upset with your child if they decide to not participate in the survey.

SIGNATURE CLAUSE

If you have any questions or issues with this survey, you may contact Drew Mohr with [REDACTED] at [REDACTED]. Thank you for taking the time to consider.

Do you want your child to participate in the survey?

☐ *Yes*

☐ *No*

Name of Student (Print)

Signature of Parent

Date

A copy of this form has been given to me _____ Subject's Initials

Appendix C**Child Assent Form for Minors Aged 13-17**

Study Title: Student-Athlete Drug Deterrence and Impact of Screening: A Quasi-Experimental Study

Research Investigator: Drew Mohr, [REDACTED] S&C Coach; HPE Teacher, [REDACTED]

Contact information:

Office: (740) 657-4287

Email: drew_mohr@olsd.us

Location: [REDACTED], Health Room 1507/1509

What is this research about? We would like you to participate in a research study about the effects of Randomized Drug Testing on student-athlete drug use. This portion of the study focuses on a 12-question survey to help gather student body perceptions toward randomized drug testing. You can ask a question at any time and may stop participation at any time.

What will happen to me in this research? You will be given a 12-question survey to assess their feelings in three different areas; 1) student-athlete drug use; 2) randomized drug testing increasing or decreasing drug use; 3) participation in athletics with the presence of randomized drug testing; You will complete the 12-question survey using a paper and pencil.

How long will it take me to participate in the study? The testing will be completed within one 45-minute class period with the survey taking roughly 5-10 minutes.

What are the risks associated with participating in this study? We believe there are no known risks.

What are the benefits? The data from this study potentially has the power to motivate other school districts to implement Randomized Student-Athlete Drug Testing.

Do I have other choices? You may choose not to participate in this survey at any time.

Will anyone know I am in the research? As a participant, your name will be kept confidential from anyone not participating in the research study. Additionally, you are not required to place your name on the survey before answering the questions. If you choose to place your name on the survey, all names are omitted from survey results.

Will I be paid? No.

Who can I talk to about the research? You may contact Mr. Mohr.

What if I do not want to do this? You do not have to participate in this research study. You may say no at any time. No one will be upset if you decide to not participate in the survey.

SIGNATURE CLAUSE

If you have any questions or issues with this survey, you may contact Drew Mohr with [REDACTED]. Thank you for taking the time to consider.

Do you want to participate in the survey?

☐ *Yes*

☐ *No*

Name of Student (Print)

Signature of Parent

Date

Signature of Person Explaining Assent

Date

A copy of this form has been given to me _____ Subject's Initials

Appendix D

School District Permission to Conduct Research

Study Title: Student-Athlete Drug Deterrence and Impact of Screening: A Quasi-Experimental Study

Research Investigator: Drew Mohr, [REDACTED] S&C Coach; HPE Teacher, [REDACTED]

Contact Information:

Office: (740) 657-4287

Email: [REDACTED]

Location: [REDACTED] Health Room 1507/1509

What is this research about? We would like freshman students in the Olentangy Liberty High School Health classes to participate in a research study about the effects of Randomized Drug Testing on student-athlete drug use. This portion of the study focuses on a 12-question survey to help gather student body perceptions in regard to randomized drug testing. Each participant can ask a question at any time and they can stop participation at any time. We require a parental signature for each child to participate in the study, along with a student signature on an assent form. Each participant has the choice to opt out at any time.

What will happen prior to taking the survey? Students in each of the six health classes (225 total students, no more than 30 per class) will be informed of the upcoming survey two weeks prior to the survey being administered. This information of the upcoming survey will be explained by a health teacher and roughly take 2-3 minutes of class time. Although the lead researcher (myself) is a health teacher at the research site, I will be recusing myself from administering the survey. An 'Informed Consent for Research Participants' (attached) will be sent home for parent/guardian signature two weeks prior to the survey in order for each student to participate or opt out of the survey. Those who received parent/guardian signature to participate will also fill out a 'Child Assent Form' (attached) one day prior to the survey being administered. The assent form allows a student to personally sign for participation or have the option to opt out. Additionally, the survey structure will be explained by a health teacher (not the lead researcher) one day prior to administering to address any questions from those participating ahead of time.

What will happen to a student who opts out the survey? The survey will take place during the Drugs/Tobacco/Alcohol Unit. It is anticipated the survey will take a total of 5 minutes to complete for those participating. The students who opt out will work on the 'ungraded' daily assignment centered on filling out a 'Drugs/Tobacco/Alcohol' note packet during class while using the 'Lifetime Health' textbook. Those students opting out will not be punished in any way for not participating and work on the assignment without interruption during class time. The assignment will not be scored in the gradebook and not count as points for each student in each class. Those students participating in the survey will complete the note packet after the survey has been submitted.

What will happen to a student during the survey? Each participant will be given a 12-question survey to assess their perceptions of the effects of randomized drug testing in three different areas; 1) student-athlete drug use; 2) randomized drug testing increasing or decreasing

drug use; 3) participation in athletics with the presence of randomized drug testing; each participant will complete the 12-question survey using a pen or pencil. All surveys are available for parent/guardians to view upon request.

How long will it take for a participant to complete the study? The survey will be completed within one 45-minute class period with the survey taking roughly 5 minutes.

What are the risks associated with participating in this study? We believe there are no known risks.

What are the benefits? The data from this study potentially has the power to motivate other school districts to implement Randomized Student-Athlete Drug Testing.

Does a participant have other choices? A student may choose not to participate in this survey at any time. A student does not have to be in this research study. A student can say no at any time. No one will be upset with a student if they decide to not participate in the survey.

Will anyone know a student is participating in the research? As a participant, a student's name will be kept confidential if not participating in the research study. The participant is not required to place his/her name on the survey before answering the questions. Whether a participant chooses to place his/her name on the survey, all names are omitted from survey results. The only person viewing and analyzing the results is the lead researcher (myself). The school district administration, high school administration, health teacher, parent of participant, and lead researcher will be the only parties knowing the survey is taking place.

What will happen to the results of the survey? The survey results will be placed inside a locked filing cabinet within the athletic director's office. Results will be stored for approximately three years and be discarded thereafter.

Will any participants be paid? No.

Who can be contacted about the survey? You may contact Drew Mohr.

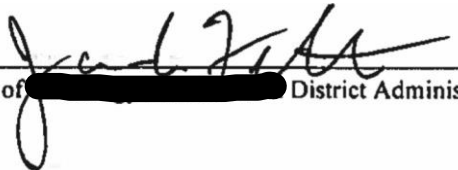

SIGNATURE CLAUSE

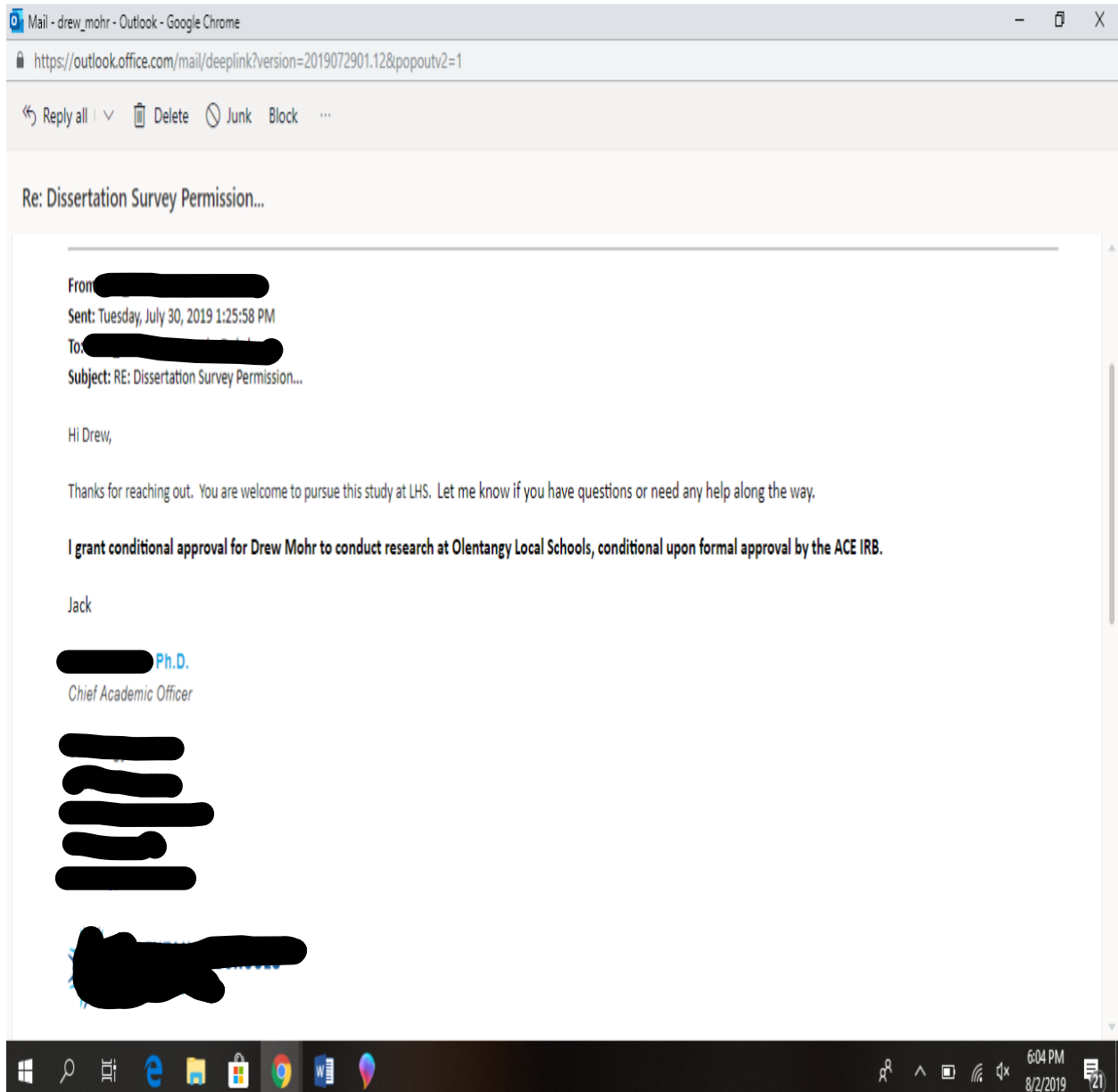
I grant conditional approval for Drew Mohr to conduct research at the Olentangy Local School District, conditional upon formal approval by the American College of Education IRB.

Name of Olentangy School District Administrator (Print)

Chief Academic Officer

Title of _____ Administrator (Print)


Signature of  District Administrator Date 12/20/19



Appendix E

Building Principal Permission to Conduct Research

Study Title: Student-Athlete Drug Deterrence and Impact of Screening: A Quasi-Experimental Study

Research Investigator: Drew Mohr, [REDACTED] S&C Coach; HPE Teacher, [REDACTED]

Contact Information:

Office: (740) 657-4287

Email: [REDACTED]

Location: [REDACTED], Health Room 1507/1509

What is this research about? We would like freshman students in the Olentangy Liberty High School Health classes to participate in a research study about the effects of Randomized Drug Testing on student-athlete drug use. This portion of the study focuses on a 12-question survey to help gather student body perceptions in regard to randomized drug testing. Each participant can ask a question at any time and they can stop participation at any time. We require a parental signature for each child to participate in the study, along with a student signature on an assent form. Each participant has the choice to opt out at any time.

What will happen prior to taking the survey? Students in each of the six health classes (225 total students, no more than 30 per class) will be informed of the upcoming survey two weeks prior to the survey being administered. This information of the upcoming survey will be explained by a health teacher and roughly take 2-3 minutes of class time. Although the lead researcher (myself) is a health teacher at the research site, I will be recusing myself from administering the survey. An 'Informed Consent for Research Participants' (attached) will be sent home for parent/guardian signature two weeks prior to the survey in order for each student to participate or opt out of the survey. Those who received parent/guardian signature to participate will also fill out a 'Child Assent Form' (attached) one day prior to the survey being administered. The assent form allows a student to personally sign for participation or have the option to opt out. Additionally, the survey structure will be explained by a health teacher (not the lead researcher) one day prior to administering in order to address any questions from those participating ahead of time.

What will happen to a student who opts out the survey? The survey will take place during the Drugs/Tobacco/Alcohol Unit. It is anticipated the survey will take a total of 5 minutes to complete for those participating. The students who opt out will work on the 'ungraded' daily assignment centered on filling out a 'Drugs/Tobacco/Alcohol' note packet during class while using the 'Lifetime Health' textbook. Those students opting out will not be punished in any way for not participating and work on the assignment without interruption during class time. The assignment will not be scored in the gradebook and not count as points for each student in each class. Those students participating in the survey will complete the note packet after the survey has been submitted.

What will happen to a student during the survey? Each participant will be given a 12-question survey to assess their perceptions of the effects of randomized drug testing in three different areas; 1) student-athlete drug use; 2) randomized drug testing increasing or decreasing drug use; 3) participation in athletics with the presence of randomized drug testing; each

participant will complete the 12-question survey using a pen or pencil. All surveys are available for parent/guardians to view upon request.

How long will it take for a participant to complete the study? The survey will be completed within one 45-minute class period with the survey taking roughly 5 minutes.

What are the risks associated with participating in this study? We believe there are no known risks.

What are the benefits? The data from this study potentially has the power to motivate other school districts to implement Randomized Student-Athlete Drug Testing.

Does a participant have other choices? A student may choose not to participate in this survey at any time. A student does not have to be in this research study. A student can say no at any time. No one will be upset with a student if they decide to not participate in the survey.

Will anyone know a student is participating in the research? As a participant, a student's name will be kept confidential if not participating in the research study. The participant is not required to place his/her name on the survey before answering the questions. Whether a participant chooses to place his/her name on the survey, all names are omitted from survey results. The only person viewing and analyzing the results is the lead researcher (myself). The school district administration, high school administration, health teacher, parent of participant, and lead researcher will be the only parties knowing the survey is taking place.

What will happen to the results of the survey? The survey results will be placed inside a locked filing cabinet within the athletic director's office. Results will be stored for approximately three years and be discarded thereafter.

Will any participants be paid? No.

Who can be contacted about the survey? You may contact Drew Mohr.

SIGNATURE CLAUSE

I grant conditional approval for Drew Mohr to conduct research at the Olentangy Local School District, conditional upon formal approval by the American College of Education IRB.

Name of _____ School District Administrator (Print)
Principal

Title of _____ (Print)

_____

Signature of  Local School District Administrator Date 12/20/2019

Appendix F

IRB Approval Letter



April 12, 2021

To : Drew Mohr

Barry Chametzky, Dissertation Committee Chair

From : Institutional Review Board

American College of Education

Re: IRB Approval

"Student-Athlete Drug Deterrence and Impact of Screening: A Quasi-Experimental Study"

The American College of Education on IRB has reviewed your application on, proposal, and any related materials. We have determined that your research provides sufficient protection of human subjects.

Your research is therefore approved to proceed. The expiration on date for this IRB approval is one year from the date of review completed on, April 12, 2022. If you would like to continue your research beyond this point, including data collection and/or analysis of private data, you must submit a renewal request to the IRB.

Our best to you as you continue your studies.

Sincerely,

Becky Gerambia

Assistant Chair, Institutional Review Board