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# An Investigation of Random Drug Testing as a Preventative Measure to Inhibit Drug Use in College Students

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AN INVESTIGATION OF RANDOM DRUG TESTING AS A  
PREVENTATIVE MEASURE TO  
INHIBIT DRUG USE IN COLLEGE STUDENTS

by

Drew Ludtke

Dissertation

Submitted to the Faculty of

Olivet Nazarene University

School of Graduate and Continuing Studies

in Partial Fulfillment of the Requirements for

the Degree of

Doctor of Education

In

Ethical Leadership

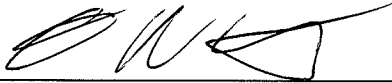
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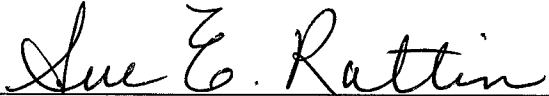
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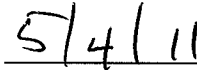
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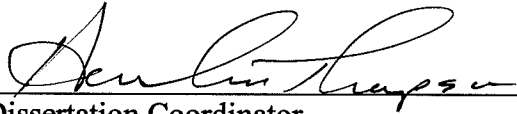
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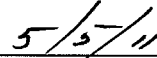
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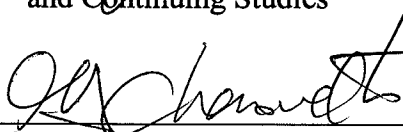
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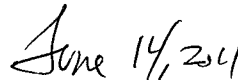
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## ABSTRACT

by

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The problem of drug use exists at most life stages. In particular, the problem of drug use exists in school settings. In a collegiate setting, students are independent from guardians for the first time and subjected to random drug testing (RDT). The difficulty in testing in a collegiate setting is finding ways to test the effectiveness of RDT. This study examined the effectiveness of an RDT program at a small Midwest university. Reports of drug use and attitudes were recorded before a RDT program was initiated and two years after. The results showed the RDT program was ineffective at preventing drug use. Slight increases in drug use and attitude were documented after the initiation of RDT.

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## CHAPTER I

### INTRODUCTION

College student success is a key concern for higher education administrators. A considerable amount of time and money goes into the recruitment and retention of each student. Searching for the best practices to keep students enrolled and on pace for a collegiate degree is a priority for administrators. Utilizing precious university financial resources efficiently is important to the university mission of serving students. University administrations have recognized the potential for academic failure existing for students who become involved in the use of drugs. These administrators have struggled over how to use academic resources effectively to help deter drug use among university students in order to see the success of the college student.

Random drug testing (RDT) has become a common practice for administrators to deter the use of drugs in athletes (Petróczi, 2007). However, there is little being done to deter the use of drugs in non-athletes even though the incidence of drug use is similar between athletes and non-athletes (Toohey & Corder, 1981; Yamaguchi, Johnston, & O'Malley, 2003). Administrators should be concerned if RDT is the best practice for retention and general health of their students, because RDT has not been proven to be effective as a deterrent (Random

drug testing spreads, 2007). Further, adopting congruent policies between athletes and non-athletes may prove to be effective for administrators in preventing drug use and in preventing academic failure for college students.

Retention in a higher education setting has become essential to the Higher Learning Commission in giving accreditation to higher education institutions; and, as parents are increasingly more involved in the decision of choosing to which institution to send their children, there has become an increased competition to obtain student enrollment. This being the case, university administrators must address the proper role of drug testing in a university setting as a moral obligation, retention objective, and as critical in the allotment of university finances.

The high cost of college and concern for the student's ability to finance college has administrators concerned with the best ways to allocate financial resources. Drug testing can be very costly; the average cost of a positive test is estimated to be between \$20,000 and \$77,000 in a workplace setting ("Workplace", 1992). As administrators deliberate on how best to allocate university finances to be most beneficial to the retention of students, drug testing has surfaced as an issue because of the cost and ultimate effectiveness of RDT.

In recent years, five considerations for administrators should be noted for RDT policy development. First, federal grants and new legislations have allowed for increased funding and expansion of RDT in schools ("Random drug testing", 2007). Second, because of evidence that RDT does not deter student behavior,

studies have questioned why RDT occurs at all (Yamaguchi, et al., 2003). Third, prevention efforts (not deterrent efforts) are estimated to save nearly \$10 for every dollar invested in RDT (Aos, Phillips, Barnoski, & Lieb, 2001; Pentz, 1998; Spooth, Guyull, & Day, 2002). Fourth, the relation of behavior, social, educational, financial, legal, and physical aspects of RDT emphasizes the multiple factors for administrators to consider (Sprague, 2008). Finally, there is a stated need for further systemic research and consideration of the effectiveness of drug testing (Strelan & Boeckmann, 2006).

#### Statement of the Problem

The complexities of random drug testing make administrators' decisions difficult. Often research is not grounded in sound theory. Research conflicts in whether attitude to predict behavior or reported behavior should be studied. The role of initiation of RDT and the effects on attitude and behavior have not been quantified in past literature. Further, collegiate research on drug use habits has focused on athletes and ignored non-athletes (Strelan & Boeckmann, 2006). Examining the drug use habits of all students is important for college administrators to understand the entire student body and to development solid drug prevention policy.

Research on the deterrent effects of RDT has also been contradictory (Diacin, Parks, & Allison, 2003). Diacin et al. reviewed five studies and found that RDT positively affects athletes' attitude and perceptions toward using drugs; however, there has been little systematic research to address how or if RDT

affects reported behavior (Strelan & Boeckman, 2006). In fact, there is only one systematic study on the effects of RDT and the effect on behavior (Gerada, 2005). In a key study of 76,000 students in 8<sup>th</sup>, 10<sup>th</sup>, and 12<sup>th</sup> grades, findings suggest no differences in marijuana or illicit drug use when students were subjected to RDT (Yamaguchi, et al., 2003). Further, in universities, there has been a failure to quantify if RDT deters future use (Sprague, 2008).

Summerfield (2006) suggests that when considering a criminal behavior, people will search for techniques to avoid detection. This system of producing illegal and undetectable drugs has been named the underground pharmacy to represent the secretive nature of avoiding drug detection (Kayser, Mauron, & Miah, 2007). In addition to undetectable drugs, masking agents are produced which cover up a substance that could normally be detected in a drug test. The results are additional harmful side effects for the individual and the potential to disable the effectiveness of RDT.

Research has shown that even adolescents can use modern technology such as the internet to change drug use behaviors (Levy, Sherritt, Vaughan, Germak, & Knight, 2007). In fact, a Google search on September 22, 2009 for “passing a drug test” reveals about 3,500,000 hits. One such example to beating a drug test is to dilute your urine sample by simply drinking excessive amounts of water. In one study of at-risk participants, 17% used the dilution technique (Levy et al.) and 99% of the examining physicians misidentify one or more banned

substances in a RDT (2007), thus solidifying the need for further research in the effectiveness of RDT and its effects on reported behavior.

### Background

A review of literature suggests three theories that are of interest in current drug prevention research: Perceptual Deterrence Theory (PDT), the Theory of Reasoned Action (TRA), and the Theory of Planned Behavior (TPB). The three theories are important to the study because research suggests drug testing does not work and that a drug user would have considerable control over a positive test. The first two theories suggest that drug testing should work, while the latter theory gives some explanation for why drug testing has not deterred drug use.

There is a need to examine these theories in relation to two groups: athletes and non-athletes. Athletes are typically the first group subjected to RDT, while non-athletes are typically not required to submit to RDT. Athletes and non-athletes were surveyed using the Core Survey, which is a standardized nationwide survey given to college students. A short review of literature on athletes and non-athletes will be examined as well as information on the Core Survey.

### Perceptual Deterrence Theory

Perceptual deterrence theory was founded from ancient principles of having a strength or skill over someone weaker (Summerfield, 2006). Justice systems have evolved from this power to establish a fear of punishment to act as a strong deterrent. The modern judicial system in the United States of America was established based on the deterrence theory with a belief that an appropriate

punishment or threat will control an individual's desire to commit a crime. In random drug testing, punishments for students can be loss of eligibility, loss of games played, or expulsion from school. In a review of deterrence theory, Summerfield noted that even with harsher punishments and finding unique ways to discipline, crimes continued and still continue today.

Acting as a theoretical framework grounded in criminal research, PDT focuses on broad prevention of an offense by making an example of an individual offender, for the rest of the society to contemplate before committing a similar offense. Therefore, deterrence has two main components: (a) to present a specific punishment to the wrong doer to dissuade them from committing the crime again, and (b) to discourage other individuals from committing a crime out of fear of punishment (Summerfield, 2006).

Random drug testing in schools seeks to monitor behavior occasionally and to apply a consequence or deterrent. In modern times, drug preventative efforts have used deterrence methods to establish penalties for many crimes, including drug crimes (Summerfield, 2006). Recent Supreme Court rulings approved such deterrence methods to allow RDT of athletes in schools in 1995 and students in extra-curricular activities in 2002 (Yamaguchi, et al., 2003).

Deterrence theory modified to include attitudes or perceptions is named PDT. This theory seeks to examine the attitudes of a deterrent affecting an individual or a group behavior. PDT was only recently applied specifically to RDT with a study by Strelan and Boeckmann (2006). In the field of drug testing,

a theoretical framework for research was lacking. In this first and currently only study on PDT and RDT, Strelan and Boeckmann emphasized their research as “a long-overdue theoretical framework, perceptual deterrence, to predicting the banned drug-use decisions” (p. 2909). Findings indicated that fear of consequence was only a factor when considered apart from other factors. When considered with moral reasoning and health outcomes, the fear of consequence basically disappeared from an individual’s attitude. Moral reasoning and health outcomes were the most important deterrent to participants.

#### *Theory of Reasoned Action*

“A measure of the likelihood that a person will engage in a given behavior may be termed behavioral intention” (Ajzen & Fishbein, 1980, p. 2). Behavioral intention is a part of the Theory of Reasoned Action (TRA) which was introduced in 1975 by Ajzen and Fishbein. Ajzen and Fishbein produced the model out of frustration of other behavioral models that were poor predictors of behavior. Ajzen and Fishbein’s model indicated that attitude was a major factor (as was social norms) in predicting behavioral intention. Behavioral intention would indicate the likelihood of a behavior. It is this idea of behavioral intention that drives the vast majority of research relating to random drug testing. TRA has three basic components: behavioral intention (BI), attitude (A), and subjective norm (SN). In equation form,  $BI = A + SN$ . According to Ajzen and Fishbein, A and SN can have different weights depending on the situation.



### *Theory of Reasoned Action*

Theory of Reasoned Action has been used in drug testing literature to draw connections from attitude to behavioral intention then to behavior. In fact, most of the literature has focused on attitude leading to behavioral intentions (Diacin et al, 2003; Strelan & Boeckmann, 2006). Literature focusing on attitude toward RDT has led research to conclude behavioral intentions are strongly against drug use, though; few studies have specifically referenced TRA in their testing models (Strelan & Boeckmann).

The problem with the Theory of Reasoned Action is that attitude does not necessarily produce the actual behavior, just a behavioral intention. Further, Sheppard, Hartwick, and Warshaw (1988) emphasized a limiting condition of the TRA model, the choice among alternatives, meaning that having a choice may significantly change the behavioral intention. Thus, a fear of RDT may cause the attitude to change, but the knowledge of ways to beat a drug test may still allow the drug use behavior to take place.

Attitudinal research assumes perceptions of RDT as a predictor of drug use (Ajzen, 1991; Lucidi, Grano, Leone, Lombardo, & Pesce, 2008; Petróczi, 2007). Attitude as a predictor of behavior is congruent with the Theory of Reasoned Action. However, TRA has recently proven to be a poor predictor in human health interests. Further, factors such as threat or punishment are not considered in TRA (Ajzen, Albarracín, & Hornik, 2007; Dutta-Bergman, 2005). Thus, TRA was challenged and extended by Ajzen himself with a revised theory

call the Theory of Planned Behavior which allows for an individual's perceived control or actual control to influence behavior (Ajzen, 2002).

### *Theory of Planned Behavior*

The TPB originated because TRA was unable to account for an actual change in behaviors in some circumstances (Ajzen, 1985). TPB was designed to understand the relationship between attitudes and actual behavior when TRA could not account for the behavior, such as health issues. TPB was an addition to TRA that allowed for perceived behavioral control (Ajzen). TPB was meant to counter TRA as studies showed behavioral intention did not always lead to behavioral change (Ajzen). It is the perceived behavioral control that becomes an interest in RDT, because athletes have such a high amount of control in beating drug testing. In models such as PDT and TRA, use should be deterred simply because of a consequence in the end, but TPB allows for control of other factors in RDT. TPB allows one explanation to the studies that indicate RDT does not deter reported use, even though attitude does shift when threat of RDT is present.

General TPB research helps to account for actual behavior controls, which are the skills, resources, and intangibles that may be desired to account for a specific behavior (Ajzen, 2002). From Ajzen's (2009) website at the University of Massachusetts, behavior does not just depend on intention, but also on an adequate amount of behavioral control. Both the perceived and the actual behavioral control influence decision making (Ajzen). For example, with RDT it may be easy for students to perceive that they can beat the drug test or to have an

actual behavior control to beat the drug test. The actual controls may inhibit the effectiveness of the deterrence methods and reduce fear of detection. The TPB helps explain the contradictions in studies and attitudinal research (TRA), and helps explain the results from Yamaguchi et al. (2003).

Tricker and Connolly (1997) combined the Theory of Reasoned Action and the Theory of Planned Behavior into one model for purposes of their study. Considering perceived behavioral control was added to TRA in order to account for a lack of prediction in actual behavior in the early model; the theories have become distinctly different. For purposes of future studies, these theories should not be used as the same model but rather as separate when focusing on attitude (TRA) and reported behavior (TPB). Perceived and actual behavioral control become an interest to RDT, because students can beat RDT in many ways. The many ways to beat RDT may allow students to feel they have behavior control and/or actual behavior control, which work together to predict actual behavior in TPB.

#### *College Athletes vs. Non-Athletes*

Drug test research has focused almost completely on athletes (National Household Survey Drug Abuse, 2001; Pope, Katz, & Champoux, 1988). Little attention has been given to non-athletes, which is the majority of the college population and has been shown in demographic studies to be significantly involved in performance enhancing drugs (PEDs) and other drug use (Berning, Adams, DeBeliso, Stamford, & Newman, 2008). Berning et al. put emphasis on

evaluating the non-athlete college student because little research had been done in this area. Similarly, when rating reasons to use steroids (for example) appearance and performance have had similar power as a reason to use (Berning, et al.) and psychometric reasons to use were similar between athletes and non-athletes (Martens, Brown, Donovan, & Dude, 2005).

Green, Uryasz, Petr, & Bray (2001) emphasized that studies comparing athletes and non-athletes have been inconclusive. Research has shown a similar amount of drug use among athletes and non-athletes (Toohey, 1978; Toohey & Corder, 1981; Yamaguchi et al., 2003). Further, it has been suggested that athletes may be less likely to use recreational drugs due to the negative performance effects; however, athletes may be more prone to using performance enhancing substances to improve performance (Green et al.) than their non-athlete peers.

Research and media state a widespread problem from professional, to collegiate, and high school athletics. However, most of the drug testing effort concerns athletes with much less impact on amateur sports and the general public (Petróczi, 2007). The Supreme Court has essentially ruled in favor of RDT as a deterrent for athletes and extra-curricular activities (Yamaguchi, et al., 2003). Questions remain if RDT works as a deterrent. Further questions include whether or not RDT should be used anywhere in the school system, if RDT should be used only on suspected users, and if RDT should test all students or just specific groups (Yamaguchi, et. al.).

### *The Core Drug and Alcohol Survey*

The Core Drug and Alcohol Survey was developed in the late 1980s by the U.S. Department of Education and advisors from several universities and colleges. The survey is used by universities and colleges to determine the extent of substance use and abuse on their campuses. The survey is now administered by the Core Institute at Southern Illinois University - Carbondale (SIUC) and participation by individual schools is widely followed as a way to ensure consistency nationwide, rather than each institution administering their own version of a survey (Core Institute, 2009).

The Core alcohol and drug survey is given to college students nationwide and asks general demographic information in addition to a wide range of questions about perceptions, attitudes and drug use. Attitude about alcohol or drugs at parties, knowledge about campus alcohol and drug policy, and perceptions of alcohol and drug use on various campus groups are addressed in the Core survey. The reported behavior of alcohol, tobacco, and other drugs used in the last month or past 12 months is surveyed. Other factors are included in the Core survey that relate to collegiate life, including participation in athletics (Core Institute, 2009).

### Research Questions

1. Are there differences in the extent to which college athletes and non-athlete college students report using drugs?

2. Are there differences in the attitudes college athletes and non-athlete college students report about using drugs?
3. Is there a relationship between the extent to which college athletes and non-athlete college students report using drugs and the reported attitudes of these two groups of students?
4. Are there differences between the reported drug use and attitudes about drug use between athletes and non-athlete college students before and after the implementation of RDT when only athletes are randomly drug tested.

*Description of Terms*

*Attitude.* Readiness of the psyche to act or react in a certain way.

*Behavioral Intention.* “A measure of the likelihood that a person will engage in a given behavior” (Ajzen & Fishbein, 1980, p. 2).

*Masking Agent.* A drug used with the purpose of hiding another drug during a random drug test.

*Performance Enhancing Substances.* Drug that is orally ingested or injected into the body with the purpose of helping the person to improve athletic performance.

*The World Anti-Doping Agency (WADA).* The international independent organization created in 1999 to promote, coordinate, and monitor the fight against doping in sport in all its forms. Composed and funded equally by the sports movement and governments of the world, WADA coordinated the development

and implementation of the World Anti-Doping Code, the document harmonizing anti-doping policies in all sports and all countries (WADA, 2007).

### Significance of the Study

A university should be most concerned with the welfare of the students. Administrators look for the best way to reduce drug use to protect students' physical and mental health, to aid in retention, and to maintain a good reputation. Finding the best practices for prevention of drug use is a key to the success of our collegiate institutions. The relationship between the changes in behavior and the initiation of RDT is a key to understanding the best practices possible for reducing collegiate drug use. The relationship between athletes and non-athletes is a key link to understanding effectiveness of one commonly used method for reducing use, RDT. Finally, more studies need to have information on use and attitudes and the relation to all college students, not just athletes.

The cost of college tuition is rising making each dollar the university spends more important. Due to the heavy costs associated with one positive RDT test, policy considerations will be given to an entire student body population, not just athletes. The efforts of one small Midwest University were reported in this study.

### Procedure to Accomplish

A small Midwest university began athletic drug testing in the Fall of 2006. This university administered the Core Drug and Alcohol Survey to students in April of 2006, and April of 2008. Core data were collected by individual colleges

and universities across the country and maintained by Southern Illinois University at Carbondale (SIUC). The data from the small Midwest university was obtained from SIUC. The timeline was important as it allowed for data collection on athletes attitudes and use comparatively before and after the initiation of drug testing.

To address the research questions, this research analyzed data from the Core Drug and Alcohol Survey that was administered in 2006 and 2008. Data was analyzed to look for correlations between the baseline testing of the Core drug and alcohol survey in 2006 and for differences in 2008 (the dates were before and after drug testing was initiated). The data was analyzed to examine the effects of initiation of RDT on one small private school's drug use and perceptions. Student responses were analyzed using SPSS version 18. Descriptive statistics such as means and standard deviations were analyzed for each year of testing and each group (athlete and non-athletes). Data was analyzed using Pearson Chi-Square tests at alpha level of .05.

To obtain access to the data, the small Midwest University granted approval in writing to the Core Institute. Data were coded with participant numbers so names of participants could not be matched with their answers. Confidentiality was maintained through assigning participant codes and matching data with these codes.

Pearson Chi-Square tests were used to examine differences in the non-athletes' and athletes' responses. Collection of data before the initiation of RDT



data and after RDT data allowed correlations to test each research question and an examination of significant differences in variables. Of interest, was the establishment of baseline data prior to the initiation of RDT with Spring 2006 data. The Core survey will allow both attitude toward campus policy and reported use of drugs to be analyzed in addition to other variables.

The data gathered on athletes were compared to data gathered on non-athletes. Prior to 2006 both athletes and non-athletes were not subjected to RDT. In 2006 athletes only were required to be randomly screened for drug usage. Non-athletes had not been subjected to random drug testing in any of the years of the Core survey. The data gathered allowed for examination of the effectiveness of the RDT on the athlete population. Data gathered were used to examine differences in attitude between athletes and non-athletes. Data evaluated if attitudes change differently for athletes and non-athletes when only athletes were subjected to RDT.

Though studies have examined attitudes toward RDT, no study has evaluated attitude and reported use before and after the initiation of RDT. This study will examine the behavior of drug use and the relationship to attitudes. This study will check the reported drug use and attitude on three occasions, each two years apart. Further, examination of reported use and attitudes before and after the initiation of RDT on a college campus will aid in understanding current research practices of studying attitude toward RDT and using attitude to predict behavior. Additionally, most research indicates no difference in drug use between athletes

and non-athletes, so consideration of the drug use habits of both groups before and after the initiation of RDT is important to understanding student behavior. A triangulation of data between behavior and attitude, before and after the initiation of athletics drug testing will give insight into the effectiveness of RDT. This triangulation will aid research in understanding the connection between behavior, attitude and theoretical models.

## CHAPTER II

### REVIEW OF THE LITERATURE

#### Introduction

A significant amount of effort has been directed toward athletic drug testing, though some athletes still choose to use drugs and resort to using masking agents to cover up detection, thus wasting the time and money involved in testing. The initiation of drug testing for athletes appears to have done little to change the frequency of drug use when comparing use between athletes and non-athletes (Yamaguchi, et al., 2003). Though athletes have received the majority of the drug testing in high school and collegiate settings, it could be possible that non-athlete college students use a similar amount of drugs as student athletes (Berning, et al., 2008).

The various measures used in drug testing in both university and high school settings have evolved quickly in the last two decades. Expanding drug testing to more schools and to a more diverse population within schools was a pattern in the past and a foreshadowing for the future (Lineburg, 2005). However, research findings suggest that drug testing has done little to deter student drug use (DuPont, Campbell, & Mazza, 2002). This literature review gives an overview of some of the issues related to drug testing, including: university concerns, physical and mental health consequences of drug use, stakeholders opinions, history of drug use, history of drug use in athletics, history of athletic drug testing, drug testing in schools, drug testing policy at a small Midwest university, attitude and

drug testing, actual drug use, summary of theory, differing perspectives, and other arguments opposing random drug testing.

### *University Concerns*

Dvorak (2003) stated “It is only with chemical free minds and bodies that students can make school a part of their quality world and reach their fullest potential” (p. 1). The reduction in the use of drugs has helped colleges achieve mental and physical health in an increasing amount of students. Administrators have striven for mental and physical health to ensure the retention of students at their school. Many universities have imposed stringent drug prevention methods in an effort to reinforce the value of a drug free setting. This prevention effort has proved the value schools put on the whole student and the overall wellness of the individuals in the school system. The education of a chemically-altered mind and body has been one of the top challenges for a university in pursuit of academic excellence (Dvorak).

The average cost of tuition to a university for the 2009-2010 school year was \$26,273 for a private institution and \$7,020 for a public institution (Gordon, 2009). Tuition alone accounts for a large amount of revenue for a university, resulting in the importance of finding the best retention strategies in order to secure financial success. It has been important for every institution to use the tuition dollars as productively as possible. Universities want to retain students in attendance in order to keep tuition dollars flowing to the school, and schools are genuinely concerned with using the student tuition dollars to help every student

succeed. Further, schools are interested in the success of the individual student so that each student is not wasting time or money on college in cases where the chances of success are minimal. As schools are operating on limited budgets, particularly in the current economic recession, finding the most efficient use of these limited university resources is of utmost importance to administrators, and decisions to implement drug testing in schools becomes increasingly important due to the high costs of administering drug screens.

School districts are continually striving to provide the best education possible. In today's challenging educational climate, it is important to care for the whole student so each individual has an optimal chance for success both in the collegiate setting and later in a career setting. Administrators should be concerned with more than just academic success. Consideration for a students' mental and physical health has been the basis for drug prevention and helping students as a whole. Drug prevention could be an administrator controlled intervention in a college setting used to assist whole student development.

Williams (1974) explained that performance-enhancing drug (PED) use has become one of the major ethical problems confronting administrators of athletic governing organizations, prompting them to ban substances and test athletes. Administrators need to consider the effects of random drug testing for their student body in order to be the most effective in helping the whole student. Williams emphasized that random drug testing had not been limited to athletes, but has also provided problems for a range of administrators including coaches,

athletic directors, administrators, school presidents, and institutions (Williams). College administrators believed that random drug testing may inhibit the use of drugs with their students, aid student learning, decrease drug use, and assist with academic success (Velasquez, 2008). Among the goals of administrators is to decrease drug use, which would aid the mental and physical health of students (Schmidt, 2008). The decrease in mental and physical problems in students would increase academic performance and success.

### *Consequences of Drug Use*

Students have been known to use drugs for a variety of reasons such as to obtain a mental or physical advantage or to create a “high,” to temporarily shift a person’s mood. However, drugs typically come with effects that are short-lived. The long-term, damaging effects on the human body should be considered when administrators establish drug use policies. Some of the androgenic side effects of drug use are well documented. Hinkle (2008) cited dozens of serious side effect complications including alterations to physical appearance, increased aggressiveness, abnormal physical changes of sex organs, various cancers, and harmful fetal effects. The side effects are extensive and the drugs can be addictive and detrimental both mentally and physically. Administrators are often aware of some of these side effects when making decisions to initiate a drug testing program.

### *Stakeholders*

A political debate grounded in the pros and cons of PDT further argues if RDT has any effect on future use by students and who should be performing the testing (Stover, 2004). Speaking in favor of PDT is the White House Office of National Drug Control Policy (ONDCP) by calling for increased funding for drug tests and is considering increasing funding in the future (McKenna, 2007).

Contrarily, The American Academy of Pediatrics (AAP) spoke clearly against RDT arguing against RDT. The AAP cited a lack of evidence and inappropriate setting, preferring a hospital setting if testing should occur (Levy, et al., 2007). Both arguments cited research to support their positions (McKenna), with the former supporting RDT school testing and the later supporting testing in a medical setting.

In support of RDT is Bertha Madras, deputy director for demand reduction at the ONDCP. Madras supported drug testing and argues flaws of the University of Michigan study, insisting that random drug tests were lumped together with suspected users. For those in favor of testing, there were limited studies supporting drug tests acting as a deterrent from future use (McKenna, 2007).

Calling against current funding of federal school drug testing was Sharon Levy, Director of the Adolescent Substance Abuse Program at Children's Hospital Boston. Levy believed that the White House sponsored program ONDCP exaggerates the success of drug testing. The American Academy of Pediatrics (AAP) spoke clearly against RDT in a school setting. The AAP cited a lack of

evidence to support drug testing and the University of Michigan study that found no differences in drug use where RDT takes place (Yamaguchi, Johnston, & O'Malley, 2003).

In contrast to both the AAP and ONDCP is a presumption that RDT and punishments could create more problems than they solve and thus drug use should be allowed (Kayser, et al., 2007). Similar to prohibition of alcohol, the prohibition of illegal drugs causes athletes to hide, mask, or use undetectable and more harmful substances (Kayser et al.). The doping behavior has been pushed “underground” and has come to a point where use of drugs could not be monitored. Allowing drug use was theorized to make side-effects safer and monitored by physicians for side-effects (Kayser et al.).

### *History of Drug Use*

For thousands of years, performance enhancing substances have been used by societies around the world to promote vitality and strength (“a short doping history” n.d.). In particular, the use of steroidal hormones pre-dates their identification and isolation. For example, testosterone, as an extract from testicles, began in the late 19th century for medical use. In 1889, while its effects on strength were still being studied, a 72-year-old British neurologist, Charles-Édouard Brown-Séquard, injected himself with dog and guinea pig extract from testicles and reported at a scientific meeting that these injections had led to a variety of beneficial effects (Kuhn, 2002). Later replications of this study



indicated the amount of testosterone obtained was too low to have a significant effect (Cussons, Bhagat, Fletcher, & Walsh, 2002).

The apparent need for RDT has evolved from many centuries of drug use and experimentation by mankind. Modern technology has allowed both the synthesis of new drugs and the tools to detect when the human body has used many forms of drugs. Though issues involving drug detection is a recent debate, the use of drugs and the ethical or moral concerns over drugs, such as alcohol, have been documented as early as Biblical times and documented in research as early as the 1820's when Protestant ministers in the United States preached about the evils of rum (Prokop, 1970). By the 1830's a call for the abolition of alcohol was heard and the prohibitionists of 1881 in Kansas won a battle on the sale of alcohol, followed by the national Prohibition movement in 1920. The legal consequence of the ban on alcohol appeared to be a win for prohibitionists, though data showed that the average alcohol consumption increased from 1881 to 1920 during the times of prohibition (Donnelly, 2008). This increase in alcohol use during the time of prohibition could be similar to modern day RDT. Though RDT has been a recent phenomenon, this is one example of history showing that sanctions on drug use had not dissuaded people from using drugs.

This ill effect of legislation on drugs has been documented in another circumstance. In the Harrison Act of 1914, opiates were essentially banned from distribution. This legislation was documented as the beginning of the "War on Drugs" (Brecher, 1972). After Congress passed this legislation, the side effects

included addicts who could not get their regular prescription drugs. They turned to the streets to buy their drugs from new dealers who then sold the drugs illegally and for a much higher price. These underground dealers sought two to three times the money and caused violent or other criminal behavior to take place (Brecher).

Though the examples of prohibition and alcohol are not identical to the policies of RDT, they do show the adverse and perhaps even illogical side effects of legislation or deterrence methods on a drug or health-related behavioral issue. The deterrent effects of RDT in schools were not well document when legislation allowed for more drug testing (“Supreme Court,” 2008). It would be beneficial for administrators and politicians to further consider the side effects of new legislature or new school policies.

#### *History of Drug Use in Athletics*

Drug use through history has largely been spread among the entire population, not concentrated to a specific group of people based upon race, gender, education, athletic participation, etc. Additionally, drug use in a long-term historical sense was not specifically highlighted as something athletes do more than non-athletes. It was through modern media and modern medicine that athletes have been pointed to as the main group needing RDT in schools at both the high school and collegiate levels.

Though historical evidence of drug use by athletes exists prior to the 1900’s, the modern use of drugs among athletes was first documented in 1954 during the World Games in Moscow, Russia. A United States doctor named John

Ziegler attended the games and brought back information about the wide spread use of steroids by the Russian athletes. Ziegler spread this information across the United States in an educational setting (Voy, 1991). Soon after, Russia showed dominance in the 1956 Winter & Summer Olympics by winning more medals than the rest of the 32 competing countries combined. Of interesting note, was this was Russia's first time competing in the Winter Olympics ("Winter Olympics," n.d.).

The dominance of Russia and the strong desire for other elite athletes to achieve similar greatness caused an escalation in use of PEDs. As early as 1958, Ziegler had worked with a pharmaceutical company to develop a synthetic testosterone (Goldman, Klutz, & Goldman, 1987). Following this pharmacological discovery was evidence suggesting organized systematic use of PEDs in sports and manipulations of chemicals to create more drugs (Berning, Adams, & Stamford, 2004).

The spread of drug use from Russia in the 1950's to modern day athletes has trickled down to all levels of play. Youth, high school, college and recreational athletes have joined the elite level athletes in the use of PEDs and illicit drugs. In a 2001 study on collegiate hockey players, 58% admitted a willingness to using ephedrine or pseudoephedrine to enhance performance. 19% confessed that they planned to use banned substances at some point in their collegiate careers and 33% said they would use banned substances if it would get them into the NHL (Green, Uryacz, Petr, & Bray, 2001).

Throughout the 1960s and into the 1970s, anabolic androgenic steroids (AAS) use was confined largely to elite athletes (Wade, 1972). In the Soviet Union training program, coaches were infamous for requiring the use of steroids. In the United States, sports physicians were still insisting that AAS were ineffective in helping athletes gain an athletic advantage. Early drug manufacturers marketed steroids with claims that the drug did not enhance athletic ability (Wade). Though physicians and drug manufacturers downplayed the effectiveness of AAS, the use of AAS spread quickly into a variety of sports where muscle gain and quickened recovery were desired (Kanayama, Hudson & Pope, 2008).

At the end of the 1960's, Wade published a study on the positive muscle building side effects of Dianabol on athletes. By 1971, O'Shea successfully replicated previous research showing the muscle building properties of Dianabol in a double blind design (Wade, 1972). Shortly after these findings, the International Olympic Committee (IOC) and National Collegiate Athletic Association (NCAA) reported the use of AAS as unethical, but these organizations had no means of testing the athletes for possible use at this time.

Gilchrist (2007) highlights a scenario in which elite athletes were asked two questions.

1. You are offered a banned performance enhancing substance, with two guarantees: you will not be caught, and you will win.

2. You are offered a banned performance enhancing substance, with three guarantees: you will not be caught, and you will win every competition for the next five years, and then you will die from the side effects of the substance (p. 14).

The elite athletes were asked if they would take the performance enhancing drug in each of the scenarios. An alarming 195 out of 198 athletes said they would take the PED in question one. Question number two produced a similarly surprising number with over 50% of the participants indicating they would take the PED (Gilchrist, 2007).

Though much attention has been given to the elite level of athletics, there has still been a wide spread use among younger people. A 2003 Blue Cross/Blue Shield survey revealed that 1.1 million youth between the ages of 12 and 17 have taken PEDs or other drugs (Gilchrist, 2007). Gilchrist was unable to determine if the elite athlete drug use mentioned above began from youth drug use and subsequent addiction or if drug use among elites developed after the completion of their collegiate careers.

The National Center on Addiction and Substance Abuse at Columbia University conducted a nationwide survey on the illicit drug use rates of high school students (2001). Of interest was the percentage of use of varying types of drugs. Marijuana use was most popular at 38.1%. Following marijuana use was cocaine (7.2%), ecstasy (6.3%), methamphetamine (4.4%), AAS (3.9%), and

heroin (2.4%). These numbers represent 9.5 million high school and 5 million middle school students nation-wide who report using these drugs.

In college, the Core Institute surveys college students nationwide. The goal of the Core Institute is to assess the usage rates and consequences on college campuses. Most recently, in 2006, the Core Alcohol and Drug Survey examined the reported use of 71,189 undergraduate students nationwide. Across the country, 134 colleges were surveyed. Each university employed methods to insure a random and representative sample of their students. The Core institute reported the following usage rates for college students nationwide: Tobacco (38.5%), Alcohol (84.1%), Marijuana (30.1%), Cocaine (5.2%), Amphetamines (6.2%), Sedatives (4.2%), Hallucinogens (3.5%), Opiates (1.3%), Inhalants (1.2%), Designer drugs (2.9%), and Steroids (0.6%) (Core Institute, 2006).

#### *History of Athletic Drug Testing*

The history of modern drug use has directly affected the development of drug testing procedures at professional, collegiate, and high school levels. Drug testing was first initiated through techniques of punishment for the offender in an effort to deter the future use of drugs in athletics. Drug testing has been uniquely linked to sporting events because media attention focused on athletes, as original testing was established to combat athletic cheating (Beckett & Cowan, 1979). Actual punishments for testing positive have varied, but generally a removal from competition has been included as a punishment.

This first single nation to initiate drug testing was Britain in 1965 at the cycling event, the Tour of Britain. This was followed by the first international testing in 1966 at the World Cup (1966), which was also in Britain. The International Olympic Committee banned some substances in the 1960's and the International Amateur Athletic Federation (IAAF) made a banned substance list in 1972 (Tricker & Connolly, 1997).

Today's most commonly used RDT, urinalysis, began in 1972 with the IAAFs medical committee producing testing for PEDs (Tricker & Connolly, 1997). In 1976, at the Olympic Games in Montreal, Canada, there were eight positive tests for use of banned substances. Performance enhancing drug use was believed to reach a peak at the 1983 Pan America Games in Caracas, Venezuela because of the expansion of drug testing. It was noted that better testing and an announcement of testing just prior to the games caused many athletes to withdraw from competing for fear of being caught with drugs in their samples (Tricker & Connolly, 1997). Even with numerous withdrawals, fifteen athletes tested positive for PEDs at these games (Tricker & Connolly).

Since the initiation of athletic drug testing in Britain, there has been a spread of RDT to high school, collegiate, workplace and military settings. Most of the literature revolves around the high school setting, but controversy in RDT has been present at the collegiate level. In 1987, the NCAA announced intention to begin drug testing in national championship tournaments despite lacking court approval (Goodwin, 1987). In 1990, colleges began RDT in a campus setting

(Lapchick, 2006). Several lawsuits followed with authority granted by the Supreme Court for universities to carry out RDT on college athletes.

In 1990, the Athletic Director at the University of Montana stated that RDT works as a deterrent (Ranney, 1990). Further, the Athletic Director stated that not only is RDT a good deterrent, but it is a good excuse for athletes to tell their friends they are not going to use drugs (Ranney). This opinionated response was similar to those in support of RDT, such as the media and administrators who looked to deter drugs through methods such as RDT.

### *Drug Testing in Schools*

Drug testing has been widely debated in schools. There are five main reasons to support drug testing in schools. First, supporters state that administrators should do everything possible to stop the use of drugs with drug testing as one option. Second, it is believed that early prevention is a key to deterrence later in life. Third, by targeting athletes, supporters believe they are creating a fair and safe playing field by preventing injuries on the playing field. Fourth, administrators believe they can gain community support by doing everything possible to prevent drug use. Finally, supporters believe that schools are safer when drug testing is administered (Lineburg, 2005).

However, the opposition for drug testing seems equally as vocal. Critics do not believe drug testing would reduce the demand for drugs. Further, there is no scientific data showing a relationship between drug testing and decreased student use. Additionally, Barrington (2007) emphasized that many school



districts have only recently began to add drug testing programs without knowledge of the outcome. Lastly, opponents of drug testing argue that it strips students of their constitutional rights and teaches that civil liberties can be taken away simply because administrators have the power to do so (Berry, 1998). Russo (2001), questioned whether the power of administrators should be used to permit drug testing.

Despite the arguments on both sides, there has been a rapid increase in school drug testing due to two Supreme Court decisions. The first was that of *Vernonia v. Acton* (1995) that allowed for the RDT of all athletes. The second was *Pottawatomie v. Earls* (2002) that allowed for legal testing of all students in extra-curricular activities. Both Supreme Court decisions will be outlined below.

For the purposes of this study, it is important to look at court decisions regarding drug testing. In 1995, the Supreme Court ruled that high schools could legally test athletes. Further, the 2002 Supreme Court ruling allowed testing of all extra-curricular school activities (Yamaguchi, et al, 2003). Thus, the recent history of RDT has allowed an expansion of RDT into the school systems while simultaneously increasing the number of participants that can be tested and the number of drugs that RDT could detect (Lapchick, 2006). The Supreme Court rulings are essentially a ruling in support of RDT.

Prior to 2002, athletes were the only students permitted to be randomly tested in high schools. However, *Pottawatomie v. Earls* (2002), Supreme Court ruling allowed for schools to drug test all students participating in extra-curricular

activities. This ruling has been criticized citing the lack of scientific evidence that drug testing decreased student drug use (Yamaguchi, et al., 2003). In addition to research not backing the effectiveness of drug testing, more research began to surface that did not show differences in drug use between athletes and non-athletes (Levy, et al., 2007). Thus, theories that drug testing was effective and that athletes used more drugs than non-athletes began to be challenged (Berning, et al., 2008).

Since the 2002 Supreme Court ruling, a rapid increase in drug testing has occurred at the high school level. There has been a shift from testing athletes only to allowing testing for all students in extra-curricular activities (McKenna, 2007). This shift to testing some non-athletes has opened the door for more research in the area of non-athletes and has been recommended in research literature to focus on non-athletes as well as athletes (Berning et.al, 2008).

Drug testing at all levels in the last ten years has increased dramatically. In 1995, prior to the two Supreme Court decisions, there were fewer than 20 high schools across the country testing for drugs. In 2002, there were over 1,000 schools testing nationwide and the additional passing of *Pottawatomie vs. Earls* (2002) allowed for even more schools to test and opened the doors for school districts to test not just student athletes, but also students in extra-curricular activities. Yamaguchi et al. (2003) cited 19% of schools perform at least one type of drug testing (i.e. testing based on suspicion, activities or athletics).

The NCAA adopted the first drug testing program in 1986 (Copeland, 2002). The NCAA has expanded drug testing by requiring schools in its membership to test their athletes randomly. The NCAA initially began testing at national championship events. Eventually the NCAA mandated schools in its membership to RDT their athletes. Currently the NCAA mandates that all D1 programs will be tested each year and all D2 and D3 program may be tested any given year (NCAA, December 14, 2009). The NCAA consistently updates the drug testing and prevention policies to keep up with research in the area and have also included an educational component (Jones, 2009).

Further expansion of drug testing has occurred at all levels, including the World Anti-Doping Agency (WADA, 2007) which was created in 2001 to combat elite level athletic drug testing. Athletic drug testing has been heavily influenced by WADA's President, Dick Pound. Pound has taken a strong stance against elite athletes invoking claims of drug use by famous athletes and has pointedly stated the reasons to expand drug detection. Among one of the top reasons was a list of thirteen elite athletes who's deaths were related to a direct link to drug overuse in a two-year period from 2003 to 2005 (Gilchrist, 2007). Pound supported drug testing at international events and has helped lead the way in a global battle against PED use among elite athletes.

In summary, RDT has been controversial and drug use has continued. The recent rulings from the Supreme Court allowed for the legal testing of athletes and students in extra-curricular activities and has allowed for the expansion of RDT in

schools. Thus, only recently has research on RDT been quantified (Strelan & Boeckmann, 2006). With the expansions allowed for by law in both a collegiate and high school setting, combined with the debate in the literature, the question remains: Does drug testing work as a deterrent?

#### *Drug Testing Policy at a Small Midwest University*

The drug testing policy at this small Midwest university is similar to many of the others mentioned above. Random drug testing does take place at least once a year with a possibility of testing taking place more than one time. Testing for suspicion of drug use is possible. Only athletes are drug tested. A positive test results in no legal sanctions, only suspension from games and counseling which is consistent with other collegiate policies, research recommendations, and legal decisions. Follow up testing for a positive test is a requirement.

#### *Attitude and Drug Testing*

One of the purposes of this paper was to investigate two types of drug testing research and to find the best method to evaluate the effectiveness of RDT. The first and most widely used type of research investigates a person's attitude about drug use when there is fear of a consequence. This type of research is attitude research and is used widely under the theoretical construct of the Theory of Reasoned Action (TRA) mentioned in Chapter 1. The second type of research investigates the link between attitude and behavior and will be discussed in the next section and was also summarized in Chapter 1.

There was a battle going on in RDT research. On one hand was the TRA synonymous with attitude research that supports the role of RDT in schools. On the other hand there was research on actual behavior that suggested that RDT does not influence the behavior of students. The 1990's produced multiple pieces of literature indicating the effectiveness of drug testing based on attitude changes in students. Stefkovich and O'Brien (1997) contended that the strongest indicator of future drug use was a student's attitude toward drugs. This type of research on attitude has continued and transformed in the literature. For example, in Jones (2009) it was believed that student attitudes toward drug testing would strongly influence future behavior.

Tricker and Connolly's (1997) research on attitude found the predominant reasons athletes do not use drugs is due to the legal penalties and the fear of getting caught, rather than personal health consequences. This literature supported deterrence theory, stringent controls, and increased school drug testing. Tricker and Connolly found external influences like drug testing and legal consequences would deter drug use based on student's perceptions.

Tricker and Connolly (1997) were supported by other literature examining attitude. The general theme of the review of literature was that drug testing would change the attitude of a person. The change in attitude was believed to cause a change in the actual behavior, thus decreasing the reported behavior of drugs following the initiation of a drug testing program. Further, factors such as threats

or punishment are not considered in TRA (Dutta-Bergman, 2005; Ajzen, Albarracin, & Hornik, 2007).

Research on attitude assumed that the perceptions or attitude act as a predictor of behavior (Ajzen, 1985; Petróczy, 2007; Lucidi, et al., 2008). Attitude as a predictor of behavior was congruent with the TRA. TRA indicates that attitude influenced behavior intention; behavior intention influenced the actual behavior. For the purposes of this section, it was important to note that attitude research involving RDT indicated that behavior occurred less when RDT was present.

The formerly mentioned research on attitude had been used to predict a decline in drug use when RDT was initiated. A review of literature showed that this attitude research had been prevalent in the epistemology of RDT since the 1980's. This type of research was consistent with the TRA presented by Azjen (1985). Though the theory was typically backed up with research, Azjen noted that TRA was flawed when dealing with other health areas (for example, a smoker's attitude could be to quit smoking, but the behavior may continue). Though the TRA from Azjen was refined, many researchers continued to give support for RDT by doing research on attitude. There was a long line of research that went without a theoretical framework (Strelan & Boeckmann, 2006). However, most recently two studies showed that actual behavior as judged by reports of various types of drug use was not influenced by RDT (Strelan & Boeckmann; Yamaguchi, et al., 2003). These two recent studies correlate with the

Ajzen literature called the Theory of Planned Behavior (TPB). These theories allowed for an individual's perceived control or actual control to influence behavior (Ajzen, 2002; Strelan & Boeckmann; Yamaguchi et al., 2003).

Though research in non-health fields emphasized a strong relationship between attitude and behavior, research in health fields did not show a strong relationship between attitude and behavior (Fishbein & Azjen, 1975). Fishbein and Azjen's (1975) work on attitude concluded "the best single predictor of an individual's behavior will be a measure of his intention to perform that behavior" (p. 369). Fishbein & Azjen's conclusions were in line with the TRA which was highlighted earlier. A person's behavioral intention is consistent with attitude and the two are closely linked throughout RDT literature as predictors of behavior. Tricker and Connolly (1997) cited a review of literature that continued the emphasis on attitude as important in the formation of a behavior.

Historically, attitude research on has been shown as a great predictor of behavior (Ajzen & Fishbein, 1980; Ajzen & Madden, 1986; Sheppard, Hartwick, & Warshaw 1988; Madden, Ellen, & Ajzen, 1992). However, with time Azjen (1991) modified his original theory to fit health behaviors. Azjen found that attitude research was not a good predictor of behavior when health areas are involved. Though Azjen modified the theory, drug prevention research has continued to focus on attitude as a key predictor of drug use.

Despite Azjen's (1991) modification of TRA, research on attitude toward drug testing continued after the 1990's. A review of literature from Diacin, Parks,

and Allison (2003) showed some studies that justified RDT. These studies focused on athlete's perceptions of drug testing and not the actual behavior (Diacin et al.). Though much research had supported RDT influencing attitude (Tricker & Connolly, 1997; Diacin et al.), evidence of actual change in behavior had not been found. Attitudinal research continued as the most popular way of supporting RDT and the most popular form of research.

Petróczi (2007) questioned the validity of attitude research suggesting that changes in attitude are a futile approach unless they can prove to be an actual predictor of future use. The model Tricker and Connolly (1997) used in their research was not used simultaneously with other factors such as moral beliefs, social costs or health concerns and thus was limited (Strelan & Boeckmann, 2006). Other studies were conducted without a theoretical framework to guide variables and to build hypothesis (Strelan & Boeckmann).

Though much research on RDT has been on attitude, TRA had demonstrated a poor predictor in human health interests in a general sense (Azjen, 1991). Drug testing research had not adequately examined the effects of RDT on the actual behavior, rather, research had relied on attitude research that showed the initiation of a RDT policy should decrease drug use based on TRA. Knowing that the TRA had not been a great predictor in health interests, there had been a need for more research to examine drug use without the involvement of attitude. A research design to show reported drug use before and after the initiation of RDT will add great insight into the effectiveness of RDT.



Considering that perceived behavioral control and actual behavioral were added to TRA in order to account for a lack of prediction in actual behavior in the early model, the theories have become distinctly different. Under the revised model, a person would have control. This control changes the original theory because the behavioral intention or attitude does not predict the behavior (Ajzen, 1991). In Ajzen's modified theory, the behavior intention could be bypassed if the behavioral control directly influences the behavior. Thus, under the Theory of Planned Behavior (TPB), the behavior intention could have less meaning and could even be meaningless under certain conditions (Ajzen). The perceived behavioral controls may require further examination in future research. When considering what perceived behavioral controls are, it is important to consider the following ideas from current literature: underground pharmacy, masking agents, guessing the test day, and knowledge of which drugs are being tested.

To summarize, research on the effectiveness of RDT has been a relatively new line of research dating back to the 1990's. The effects of RDT and drug use have not been established. There is a need for more research in the area and an examination of the effects of RDT on future behavior. There is a need to examine whether attitude toward RDT is actually an indicator of future use or if attitude is not an effective tool. An assessment of the correlation between attitude and future use will help researchers understand if the research on attitude is accurate or if new data collection methods are needed.

### *Reported Behaviors and Drug Testing*

With history in context, we know that RDT has expanded since the 1990's and continued expansion due to recent legislation. This growth of RDT has led to two key studies on actual behavior. The first key study by Strelan and Boeckmann (2006) examined situations which would decrease or increase the use of drugs and found RDT or a legal consequence to be less significant than personal health or moral reasoning. One key study was able to produce reports on actual behavior that suggested drug testing had no influence on the use of drugs in 8<sup>th</sup>, 10<sup>th</sup> and 12<sup>th</sup> grade students (Yamaguchi, et al., 2003). These two studies are the reasons why researchers are currently having trouble distinguishing if RDT is an important key to the prevention of drug use. There are only two systematic studies that examine the affects of RDT on subsequent drug use. These studies will be reviewed below. Both studies devalue the importance of RDT as a deterrent.

Strelan and Boeckmann (2006) examined an attitude model on elite athletes. Strelan and Boeckmann found attitude to be an important indicator of drug use. Strelan and Boeckmann added to the research conducted by Tricker and Connolly (1997) with a focus on multiple issues in each scenario instead of each issue separately, as was the case with Tricker and Connolly and other reviews of literature (Strelan & Boeckmann). Strelan and Boeckmann included hypothetical models in which moral reasoning, health consequences and legal consequences are considered simultaneously.

Contradicting Tricker and Connolly (1997) and other research on attitude, Strelan and Boeckmann (2006) found athletes would initially consider moral beliefs, then fear of negative health consequences, and finally possible legal ramifications. Of note, when the behavioral model included health consequences and moral beliefs, the possibility of legal ramifications practically disappeared from consideration as a reason to not use drugs (Strelan & Boeckmann). Thus, Strelan and Boeckmann concluded when athletes consider whether or not to use a drug, RDT had very little impact on whether or not a drug was used.

Strelan and Boeckmann's (2006) research downplays the significance of RDT and fear of a consequence influencing drug use behavior. The participants in this study did not take into consideration the legal consequences or only considered the legal ramifications to a very minor degree. In a second scenario athletes were questioned about drug use with no legal threats or sanctions. In this scenario the athletes significantly demonstrated taking advantage of lack of legal controls, in their opinion supporting PDT. However, in real life RDT, athletes have many controls that prevent detection of drug use, which are not mentioned in Strelan and Boeckmann's writing, that hinder the role of PDT in the RDT field of research.

Strelan and Boeckmann's (2006) research supports the University of Michigan (Yamaguchi, et al., 2003) study that found RDT did not affect future drug use in high school students. Yamaguchi et al.'s study was the largest systematic study of the relation between drug testing and use. Over 76,000 8<sup>th</sup>,

10<sup>th</sup>, and 12<sup>th</sup> grade students from across the country were studied. School administrators were surveyed to exam the school drug testing policies present on their campuses.

Yamaguchi et al. (2003) concluded that any type of drug testing (urine sample, mouth swab, or other) did not reduce student marijuana use in the past 12 months. The study compared student responses of schools that had drug testing with student responses from schools that did not have drug testing. The lack of a significant difference in marijuana use was similar under any type of drug test, such as suspicion, athletic or extra-curricular. Yamaguchi et al. cited a self criticism in their study with emphasis on schools that drug tested may have had higher levels of drug use prior to the initiation of their drug testing policy. When the drug testing policy was implemented, the schools that test had higher levels of drug use that decreased upon the implementation of the drug testing. This study lacked an evaluation of drug use rates before and after the implementation of RDT.

To summarize, the literature indicates that attitude has been affected when considering RDT. What is not clear is if drug use behavior is decreased in a drug testing setting. However, based upon the only two systematic studies on behavior when RDT is present, the Yamaguchi et al. study (2003) and Strelan and Boeckmann (2006), indicate attitude toward RDT does not affect the reported behavior. Due to both the increase in RDT program initiation in schools and the decreased support in the limited literature, it is important to get more information

prior to making further decisions. Additionally, a review of literature by Sprague (2008) found that there was not sufficient quantitative data to support RDT as an effective deterrent. Sprague contends that even though RDT is spreading, there was still much debate on if it is effective.

There is limited research on the actual or reported use of drugs in a setting where RDT is administered. More research on reported use of drugs needs to be performed. To address Yamaguchi et al.'s (2003) self-criticism from earlier in this writing, a research design that looked at the same body of participants before and after the initiation of a drug testing policy would support their claim that drug testing policies seem to do little, or even nothing, to deter future drug use behaviors. In this review of literature, no studies were found to examine athlete or student attitude and reported behavior of drugs before and after drug testing was initiated. Results from past studies were inconclusive. Sprague (2008) emphasized the problem with the research, "At a time when drug testing is expanding in schools, precisely how well it works in reducing drug use among middle and high school students is a much-debated topic" (p. 5).

#### *Summary of Theory*

The TRA and attitudinal research seemed to support the role of RDT in schools. The TPB and perceived behavioral control and actual behavioral control were of interest with literature suggesting RDT did not change drug use

(Yamaguchi et al., 2003). Further, the theories may find perceived behavioral control and actual behavioral control useful for understanding the psychology of the drug user and the amount of control the offender had in the situation of RDT.

Azjen & Fishbein's (1980) TPB allows for a control mechanism having greater value than attitude. Azjen & Fishbein have noted in their research that attitude did not influence behavior in health fields. Azjen (2009) described actual behavioral control in this way:

Actual behavioral control refers to the extent to which a person has the skills, resources, and other prerequisites needed to perform a given behavior. Successful performance of the behavior depends not only on a favorable intention but also on a sufficient level of behavioral control. To the extent that perceived behavioral control is accurate, it can serve as a proxy of actual control and can be used for the prediction of behavior. ("Actual Behavioral Control" 2007, para. 1).

The following writing will emphasize some of the actual control methods that may be used for prediction of behavior. Specifically, this section will examine ways a person could still use drugs in cases where they may be drug tested. The intention of this section is to show actual controls in which a person may employ to pass a drug test. This is important for both the theory and the application to understand how drug testing effects drug use.

A control mechanism may help a person continue to take drugs without fear of being caught under the threat of RDT or other consequences. A student may continue take a drug for social, addictive, mental, or physical reasons. Those

who know they will be subjected to drug testing, but want to continue to take a drug(s) have options which will be outlined below.

Two ways to pass a drug test include substituting another person's urine into the test vial or by chemically cleaning a hair sample. Indeed it is plausible that almost any "unclean" drug user can pass a drug test. Additionally, some students will just play the odds and take drugs in the Summer or athletes may take drugs in the offseason or pre-season when they believe they would not be tested.

Further, taking drugs that are undetectable are possible. The underground pharmacy was one method that may be used for cheating on a drug test. Taking drugs from the underground pharmacy is a method for drug users to always be one step ahead of the testers. The substances from the underground pharmacy are chemically altered so that testers and the drug test do not know the chemical make-up. The testers can only look for substances that they are aware exists and have a test to combat. The underground pharmacy is infamous for always being ahead of the testers, meaning they always have a drug that the test cannot detect. By the time testers find out about a new substance, the underground pharmacy already has another substance they are using to cheat the test (Tricker & Connolly, 1997).

Masking agents are easy to find at any supplement store. Essentially, a masking agent is another drug that covers or masks the use of the first drug used. Taking a masking agent is dangerous amounting to doubling of the amount of drugs taken into the body. Both the original substance taken and the masking

agents have side effects that can harm a person physically and mentally short term or long term.

Lack of reliability exists in drug testing. In a study by Levy et al., adolescent known users, up to 17% out of 710 tests showed evidence that adolescents tampered with their urine samples. Known users were able to excessively hydrate or use other methods of diluting the sample. This dilution can cause trace levels of drug use to be too low to detect. Further, 85 of the 710 samples (12%) were open to misinterpretation, either from being positive or negative. Thus nearly one in every five users would tamper with the sample and another one in every eight participants would have a test that was opposing the actual behavior (Levy, et al. 2007).

#### *Differing Perspectives on RDT*

On one end of the continuum it seems plausible that prevention and education efforts should begin prior to peer pressure and experimentation which can lead to addiction and future use (Sprague, 2008). On the opposite end of the continuum, adult work place evidence has been highly in favor of drug testing for financial savings. These workplace savings were emphasized by research completed at the Career Management International of Houston in a review from Delevett (1997).

Delevett documents the financial savings of drug testing in time off, workman's compensation, job errors, lost production, and medical bills. According to Delevett, drug users miss two times as many work days, take five



times more sick leave, have less job retention, demand more from management, cause friction with other workers and could be to blame for theft or damage to company property or equipment. The evidence in the work place is easy to see because the financial savings of companies that drug test are documented apparently without challenge. In the middle of the continuum between knowing preventive effort is good and knowing drug testing is effective in the workplace, is a gray area aloft with high school and collegiate research that seems to leave many stones unturned. This study looked at both sides of the issue by examining current theory from a research perspective.

Further literature emphasizes this current theory of uncertainty. Supporters of drug testing say that it gives students an excuse to tell their peers they do not want to take drugs (“Random Drug Testing”, 2007). On the opposite side of the argument is the fact that tests are invasive and costly. Furthermore, it was argued that drug testing does not deter future drug use and drug tests can be beat even if drugs are in their system. Both sides of the issue can point to research that supports either position (“Random Drug Testing”).

Sprague (2008) emphasized the conflicts of drug testing. Sprague focused on high school research and the arguments for and against testing. There is still strong support for testing and against testing. Both sides can cite recent research for their arguments. Regardless of either position on drug testing, the Federal government is financially supportive of initiatives to increase and further study

the effects of testing in schools. Though Federal funding is available, the debate remains on if drug testing helps prevent future drug use.

Theoretical differences between the student-athlete and non-student athlete have changed as the landscape of drug testing and research has evolved. There has been a missing link in the research to address attitudes of student-athletes versus non-athlete college students. Because some of the first venues for testing in the late 1980's were in athletics, there were, in presumption, many more athletes using drugs. Theory in this area has shifted as some evidence that drug use among student athletes and non-student athletes has shown similar user levels. Cultural contexts help shape an individual's attitude toward drug use, so the culture of an athlete's setting was once perceived to be different than his/her non-athlete peers. More research was needed to investigate the differences in student-athlete and the non-athlete college student and relation to drug use in a college setting. This was important because a significant amount of the prevention effort at the high school and collegiate level is directed toward athletes, though high schools have shifted toward testing more extra-curricular activities due to the 2002 Supreme Court ruling and subsequent government grants to aid the testing costs. Though much time and money has been put into athletic testing and prevention, the use of drugs continues. Finding the best solution to drug testing or prevention was still at the forefront of the U.S. Government as significant recent grants have been made to increase funding in schools and to perform research on the effectiveness of drug testing.

To further confound the theory, despite more stringent drug testing, students still choose to use the drugs and were capable of using masking agents to cover up detection, thus wasting the time and money involved in testing by creating an appearance of non-usage. Research had shown non-athlete college students use a similar amount of drugs, albeit possibly a different set of drugs, than a varsity athlete (Berning, et al., 2008).

Students are confused on what is right and wrong. For example in the article titled “Our Drugs Are Better than Your Drugs” Finley (2007) shared the similarities and the differences of drug prevention policy. Finley related drug prevention policy to the hand-out of amphetamines by school administrators. Finley emphasized the school’s anti-drug message vs. the school’s distribution of drugs. Amphetamines and other drugs were prohibited from student use, while at the same time the school nurse was handing out amphetamines to students who were prescribed to use by their doctor. In addition to the confusing message on drugs, was the addiction and abuse of the prescription drugs. The abuse of prescription drugs was the 2<sup>nd</sup> most common way to abuse drugs. Prescription drugs were second only to marijuana use by people age 12 to 24. Finley outlined the similarities between prescription drug use and marijuana use. Finley noted similarities in attitude, ease of access, reason for use, and the culture around them.

Groups such as the Office of National Drug Control Policy (ONDCP) and the Adolescent Substance Abuse Program at Children’s Hospital Boston have vast interest in knowing whether drug testing is successful at prevention. The

American Academy of Pediatrics argues against testing citing that testing should take place with parents in a medical setting (McKenna, 2007). Thus research on attitude examining RDT and effectiveness should be discounted until more research is done on actual or reported behavior and this relationship to RDT. Therefore, more emphasis on examining reported behavior of drugs while RDT is present is much more beneficial.

#### *Arguments Opposing RDT*

In addition to the lack of reliability, there is a debate on who should administer RDT. Levy et al. (2007) specifically cites a 2005 survey that found 80% of United States physicians who specialize in pediatric, family or adolescent medicine disagreed with the ONDCP policy that all adolescent students be tested for drugs. John Knight, from the Children's Hospital in Boston, stated that only limited support existed in past literature which showed a slight decrease in marijuana use or no change in behavior. Strelan and Boeckmann (2006) and Yamaguchi et al. (2003) verified Knight's position against the use of RDT.

McKenna (2007) further reported on the inaccuracies of drug testing, emphasizing that tests can flag clean students and tests can miss the actual drug users. McKenna cited a need for accuracy in testing and the difficulty in understanding or interpreting the results. Though strategic re-test plans are in place for federal employees who test positive, there are no such plans in place for students who test positive because of the extensive costs involved to the school district.

Positive tests peaked and began to decrease in the early 1980's, which caused support for RDT and people believed RDT was decreasing drug use (Tricker & Connolly, 1997). Drug testing was thought to be unquestionable in deterring use. However, the underground pharmacy, first documented in 1971, began to conflict whether deterrence theory was effective in RDT (Tricker & Connolly) or if athletes were learning new methods to avoid detection. It was hypothesized in the underground pharmacy model that drug use continued in an undetectable manner, thus eliminating the effectiveness of RDT (Tricker & Connolly). Also, confounding the drug testing results was more capability to cover up drug use or to take a masking drug to pass the drug tests. This method in which criminals learn how to commit a crime without being caught was consistent with deterrence theory highlighted in chapter 1. The drug users find a way to avoid being punished for the crime (Summerfield, 2006).

Although literature stated that drug detection peaked in 1983 (Tricker & Connolly, 1997), we now have specific examples of the use of the underground pharmacy. Exemplifying the problems with RDT, Marion Jones, one of the most famous track and field athletes in history, was one of a number of athletes who alleged to have taken PEDs from the underground pharmacy. Marion Jones was tested 160 times for PED use and never tested positive. Jones eventually admitted to the use of PEDs for many years after being convicted of lying to Congress about her drug use (WADA, 2007). The director of the World Anti-Doping

Agency emphasized the difficulty in workable testing, given a public fact that Jones had multiple negative tests prior to the 2000 Olympic Games (WADA).

The World Anti-Doping Agency asked to review all drug tests provided by Marion Jones, winner of Five Olympic medals in 2000, to see if the United States anti-doping agency had accurately performed the tests. Jones was convicted of lying to Congress and sentenced to six months in jail after evidence was given of her knowingly taking PEDs. Dick Pound, the director of WADA emphasized the difficulty in workable testing by stating, "It's not much fun to find out that someone who has been tested 160 times later admits to having been using these substances prior to the Olympics in Sydney in 2000" (Wada push for review of fallen Jones' drug tests, 2007, pg 1). Jones was most probably undetected because of using drugs produced in the underground pharmacy. In the underground pharmacy, chemists have manufactured new drugs that were undetectable. These underground chemists produce a revolving door of new drugs much faster than the International Olympic Committee (IOC) and ethical doctors who produce the drug detection technology. When a drug test becomes sufficient to detect a new drug, there are usually other drugs for athletes to take that are undetectable.

In addition to drug tests not actually detecting drugs or chemists producing undetectable drugs, Tricker and Connolly's (1997) research showed that attitudes of some student athletes indicated that they would "use drugs if they perceived that there was little or no chance of detection with severe penalties for using illegal drugs" (p. 117). Tricker and Connolly emphasized a potential cleverness of

athletes to beat the system, but that the extent to which an athlete would go to is open to future questions. Tricker and Connolly focused their research on the student-athlete, and concluded that “educational strategies that encourage at-risk student athletes to develop stronger internally motivated reasons for resisting illegal ergogenic aids and other psychoactive drugs” (p. 117) are the most effective strategies.

Finding a proactive way to develop the stronger, internally motivated reasons to resist drug use seems to be the best route for stopping use (Hinkle, 2008). Peer education and proper attitude toward drug use were lacking. For example, 96% of American youth said they were aware of potential health hazards of PED use (Hinkle). However, only 70% of the youth and 50% of adults could identify potential effects of PED use (“Alarming number”, 2001). Drug use still continues at alarming levels and thus looking for the best decision making strategies for all organizations in a position to aid in prevention and testing is important. At the university level, there may be a need to focus efforts campus-wide, rather than just on athletes.

There was anecdotal evidence of principals stating drug testing and claiming that less students use drugs. The strengths of having a drug testing program include creating a culture that disapproves of drug use, promoting and educating on tests that will inevitably occur in future employment, sends a message that the school is serious about deterring use, can improve academics and health, increased chance of getting to college, decreases absences, and is less

likely if someone is watching. These are all anecdotal strengths to support drug testing, but not proving that drug testing prevents student use. This subjective evidence has not yet been supported by research (Yamaguchi, et al., 2003).

The various ways to cheat the drug testing have caused Sprague (2008) to emphasize that drug abuse prevention be encouraged prior to peer pressure and possible experimentation with the drugs. Additionally, Sprague emphasized beginning awareness at home, in school and possibly in a religious setting. Sprague's review cited lack of quantifiable research to support RDT. Hinkle (2008) concluded that performance enhancing substance use was prevalent and escalating due to media, pressure, and appearance.

Jones' case took years of work to find a conviction and to get an admission of use. Jones was one of many athletes who have been shown to use drugs, but have never tested positive. This hurts the case justifying the cost of drug testing as even college or high school athletes can gain knowledge about and access to undetectable drugs (WADA wants review of Marion Jones drug tests, 2007).

In addition to the "undetectable drugs" theorized to be used at all levels of athletics, masking agents have played a unique role in drug history. Athletes may be taking a PED and a masking agent; thus, these users are effectively doubling the drugs taken and doubling multiplying the side-effects. To counter the risk involved with adding the drugs put into an athlete's body, one theory suggests allowing drug use in competition. This would effectively make other sports



similar to the steroid body building shows that allowed the athletes to take the steroids without testing (Berning, et al., 2008).

### Conclusions

It was the hope that the initiation of RDT in a school setting decreased the use of drugs. The research on attitude suggested that RDT would influence attitude. Research examining reports from principles suggested that no change or very little change in use of drugs occurred when RDT was presented. A fear of a consequence was the last thing a person considered when deciding whether or not to use drugs. The research on attitude may not be considered an optimal manner to address behavior in health fields. The literature had limited studies on the role of RDT and the use of drugs.

Recent studies have explored effectiveness of RDT through examinations of positive tests and benefit the literature on reported behavior. The problem existed that RDT may not prevent drug reports as reported by principles. Due to the confounding outlined above with students having the ability to avoid detection in multiple ways, a study that addressed the use of the drugs from a different viewpoint would benefit schools. The researcher examined one school and the changes that have occurred in both attitude and reported behavior both before and after the implementation of a RDT program. This study examined student self-reports of drug use that occurred both before and after the initiation of a RDT program. This study was the key to adding knowledge to the existing literature

and gaps in the research. The study addressed if attitude and behavior were equally or differently impacted when RDT was initiated.

In chapters 3 and 4 the researcher explored the relationship between reported behavior and attitude in attempt to understand past research which was typically studied by examining either reported behavior or attitude, but not both. Understanding the relationship between reported behavior and attitude will help understand the past research and where to direct future research. The researcher also examined both attitude toward drugs and reported behavior of drugs before and two years after the implementation of RDT. This method of evaluating both attitude and reported behavior before and after RDT also has not been used. Understanding this relationship is important to understanding the data from other research and could shed light on the best practices of research in this area. The differences between athlete and non-athlete drug use were examined, as well as the difference between attitudinal research and reported behavior research and the recent research that down plays the importance of RDT as a preventative measure.

## CHAPTER III

### METHODOLOGY

#### *Introduction*

The review of literature in Chapter II offered research on student athlete willingness and ability to find and use drugs. Past research was questioned on the effectiveness of random drug testing. Research had conflicting results as attitudes suggested random drug testing was effective (Tricker & Connolly, 1997) while other studies that examined reported behaviors found that random drug testing did not actually influence reported drug use by high school students (Strelan & Boeckmann, 2006; Yamaguchi, et al., 2003). There has been less information available on collegiate students and the effects of random drug testing on the prevention of drug use.

Chapter II discussed some of the alarming drug use rates such as the indicated 1.1 million of our current youths having had taken PEDs or other drugs (Gilchrist, 2007). Another startling finding was a reported 195 out of 198 youth who indicated that they would use a banned PED if they would not be caught and if it would increase their chances of winning (Gilchrist). The review of literature suggests that random drug testing may not be effective. Therefore, research needs to find the best ways to be proactive in fighting the war on drugs. The goal of this chapter is to lay out the methodology so that researchers at other universities can replicate the study with their own students and find an effective method in reducing drug use among college students and student-athletes.

Of particular interest in replicating the study are those universities that have a random drug testing program in their school and also regularly administer the Core Alcohol and Drug Survey or a similar survey. As noted in the following pages, the key to this methodology was to have Core Survey data before the implementation of random drug testing and to have the same data after the random drug testing. Individual schools could add to this research by examining the deterrent effects of their own students. Additional data would allow school practitioners necessary data in which to make educated decisions regarding their students.

The methodology reflected in this chapter was designed to help assess the best ways to fight college student drug use. Information on the effectiveness of random drug testing on both attitude and reported use has been gathered using this methodology. Data from other research has focused on the influence of random drug testing on attitude or on reported behavior. This methodology allows for examination of random drug testing, attitude and reported behavior with the same population of students at the same school. The longitudinal approach was also important as other studies have captured perceptions at one time. This design has added to the literature with the attitudes and reported behavior being recorded both before and after the implementation of random drug testing. The data will help determine which methods of data collection are the most appropriate for examining the effectiveness of random drug testing.

Triangulation of results from the research questions to the methods has provided some insight into future prevention. Of particular interest in this design was to find out if the reported use changes after the initiation of drug testing. Also of interest was exploring if student attitude changed after the initiation of drug testing. Chapter II suggested some discrepancies in the research and also suggested that attitude would change, but that reported behavior would not change.

Chapter III is a review of the research questions, research design, population, data collection, analytical methods and limitations as related to the effectiveness of RDT on attitude and behavior. Data was collected to answer the following research questions:

1. Are there differences in the extent to which college athletes and non-athlete college students report using drugs?
2. Are there differences in the attitudes college athletes and non-athlete college students report about using drugs?
3. Is there a relationship between the extent to which college athletes and non-athlete college students report using drugs and the reported attitudes of these two groups of students?
4. Are there differences between the reported drug use and attitudes about drug use between athletes and non-athlete college students before and after the implementation of RDT when only athletes are randomly drug tested?

The Core Alcohol and Drug Survey was used because it was nationally recognized and easy to use as a longitudinal study before and after RDT was implemented. The Core Alcohol and Drug Survey was used on 134 campuses across the country, allowing for definite opportunities to reproduce this study. Over 70,000 students have been surveyed across the country (Core Institute, 2009).

Core Alcohol and Drug Survey as a survey was administered nation-wide and was collected from individual colleges and universities across the country. The surveys were collected by either mail or electronically from individual universities to the Core Institute at the Southern Illinois University at Carbondale. Once a university participates in the survey, the data becomes property of the university who administered the survey. In this case, the data was owned by the small Midwest university which administered the survey.

Information on the reliability and validity of the Core Alcohol and Drug Survey data was provided by the Core Institute of Southern Illinois University at Carbondale. Test-retest reliability for the Core data was considered high. Test-retest reliability for age of first use indicated a high correlation ranging from .61 to 1.00. The test was shown to be reliable on almost all questions, including those used in this research design. The test retest reliability was similarly shown to be reliable across other factors such as use in the last month and use in last 12 months (Core Institute, 2009).

Content related reliability was the measure that addressed whether the questions from the survey were appropriate for measuring what the test said it would measure. A panel assigned by the Core Institute used their professional judgment to choose the content and the scoring system for each question. The raters had an agreement of 1.00 on the inter-rater item inclusion.

### Research Design

The research design used in this study was implemented to address the conflicting results from past research. The review of literature has shown that research with attitudinal changes has given evidence that random drug testing is effective. In contrast, the same review of literature has revealed that research on reported use revealed no change in participant's responses of reported drug use after the initiation of random drug testing.

This design has allowed the researcher to look at attitude and reported use with the same populations. This method was a key because it incorporated both attitude and reported use, before and after the implementation of random drug testing. The study has helped increase the understanding of the effectiveness of random drug testing. This method also added to previous research by giving a better understanding of which type of research is the better method for future studies on drug prevention. The goal of the design was to give proper acknowledgment to one of the two common methods of researching the effectiveness of random drug testing (attitude or reported use).

To obtain access to the data, the small Midwest university's contact person with the Core Institute had to write a release letter to give the researcher access to the data. The Core Institute granted written permission to the university and the researcher to use the data. The data was then sent from the Core Institute directly to the researcher for analysis.

The researcher obtained approval from two separate Institutional Review Boards. The researcher obtained approval from both the doctoral degree granting institution and the institution which had implemented random drug testing. Both institutions were required to grant approval through the Institutional Review Board. In this case, the degree granting institution had to provide approval prior to the institution through which the data was gathered. An agreement with the institution that granted use of the data was made, stating that the data used in the research would not be identified with the institutions name in the research or other media sources.

Data were coded with participant numbers so names of participants could not be matched with the data. Participant's names or identification numbers were not available on the data returned to the researcher from the Core Institute. Participant's names were not coded on the initial survey and there was no way for the researcher to have access to the participant's names when the data was received from the Core Institute.



### *Designating Questions on Attitude and Reported Use*

The Core Alcohol and Drug Survey had various demographic questions. The Core Alcohol and Drug Survey had numerous questions relating to attitude and reported use. Distinguishing between questions studying attitude and questions studying reported use was important to address the 3<sup>rd</sup> and 4<sup>th</sup> research questions. The researcher distinguished which questions were related to attitude and which questions were related to reported behaviors. Examples of these questions are given in the following two paragraphs and will help for replication studies.

An example of a question that addressed attitude was question 35: “How much do you think people risk harming themselves (physically or in other ways) if they...A. Try marijuana once or twice, B. Smoke marijuana occasionally, C. Smoke marijuana regularly,” etc. There were 16 similar sub questions (from A to P) that addressed attitude toward various drug use behaviors in question 35. Participants on these questions were asked to mark the best choice for each sub question by checking one of the following boxes: no risk, slight risk, moderate risk, great risk, or can’t say. The questions on the Core Alcohol and Drug Survey Long Form that the researcher designated as attitude included questions 19 (a,b,c,d,e,f,g,h,i,j,k, and l), 28 (a,b,c,d, and e), 29 (a and b), and 30 (see appendix A).

An example of a question that addressed reported use was question 37: “During the past 30 days, to what extent have you engaged in any of the following

behaviors?” There were eight sub questions (from A to H) including sub question A. “Refused an offer of alcohol or other drugs,” B. “Bragged about your alcohol or other drug use,” and C. “Heard someone else brag about his/her alcohol or other drug use.” The questions on the Core Alcohol and Drug Survey Long Form that the researcher designated as reported use included questions 14, 15, 17 (a,b,c,d,e,f,g,h,i,j,k, and l), 18 (a,b,c,d,e,f,g,h,i,j,k, and l), 33, and 34 questions (see appendix A).

### Population

The participants were college undergraduate students, freshmen to seniors. Students were recruited from the general population. The small Midwest university had a relatively large student athlete population, with approximately 30% of the students competing in athletics. This was a relatively large student athlete population compared to many schools which allowed for a larger sample of athletes. Other colleges and universities may have a much smaller percentage of student athletes and thus may require a larger sample on the Core Survey in order to obtain a sufficient number of athletes. For example, a university with only 3% of the students being student athletes would have to either recruit athletes specifically or have a much larger group of students take the survey.

Participation in the survey included 200 participants in April of 2006, and 113 participants in April of 2008. Students were recruited voluntarily from the general student population. Participation in the survey was asked of the general student population without targeting either athletes or non-athletes specifically.

The average age of the participants was normal for the college population ( $M = 22.06$ ,  $SD = 4.993$ ). The 2006 data represented 127 females and 57 males (16 unknown), while the 2008 data represented 82 females and 29 males (2 unknown).

Of particular interest to answer the research questions was having an adequate sample size of non-student athletes and student athletes. The student and student athlete populations for the 2006 data included 127 non-student athletes and 50 student athletes, with 23 unknown. In 2008, there were 72 non-student athletes and 38 student athletes, with 3 unknown.

#### Data Collection

The Core Alcohol and Drug Survey was administered to students on a small Midwest university campus. Students were asked to volunteer for the Core Alcohol and Drug Survey. Surveys were submitted electronically, although the option does exist to do a paper survey. Surveys were sent to the Core Institute for national use and permission was granted by the university's contact in the counseling department for the researcher to use the data. The Core Institute then gave the researcher access to the data through an electronic attachment via email.

Data collection included 200 participants in the Spring of 2006 and 113 participants in the Spring of 2008. Participants were initially asked to volunteer for the survey approximately March 15 of the respective years. Surveys were completed by the students in early April of each year.

The survey consisted of 39 main questions. The majority of the questions had sub-questions regarding various drugs of use, times or locations of use, and various demographics. For example, question 17 (see Appendix A) is “Within the last year, about how often have you used: A. “Tobacco (smoke, chew, snuff), B. Alcohol (beer, wine, liquor), C. Marijuana (pot, hash, hash oil),” and nine other types of drugs. The participants were asked to check one of the following: “Did not use,” “once/year,” “6 times/year,” “once/month,” “twice/month,” “once/week,” “3 times/week,” “5 times/week,” or “everyday.” The survey took approximately 25 minutes to complete (Core Institute, 2009).

The variables that were analyzed included questions relating to attitude, questions relating to behavior, and questions related to participation in athletics. Additionally, the first year of data from 2006 was collected without the presence of a random drug testing program at the university. The data from 2008 was collected with the presence of random drug testing for those who were student athletes.

The multiple questions on attitude from 2006 were compared to attitude from 2008 using Chi-Square tests. These were tested under the null hypothesis that there was no significant difference between the 2006 attitude of participants and the 2008 attitude of participants.

Multiple questions on reported behavior from 2006 were compared to reported behavior from 2008 using Chi-Square tests. These were tested under the

null hypothesis that there was no significant difference between the 2006 reported behavior of participants and the 2008 reported behavior of participants.

### *Analytical Methods*

To address the first two research questions, SPSS version 18 was used to analyze 2006 and 2008 data from the Core Alcohol and Drug Survey that was administered on campus. Data was analyzed using Chi-Square tests at alpha level of .05. Data was used from both 2006 and 2008. These dates were chosen because these dates were the nearest available dates before and after drug testing was initiated.

To address the third research question, athletes and non-athletes responses were compared using Chi-Square tests in both 2006 and 2008. Attitudes from 2006 for athletes and non-athletes were compared. Attitudes from 2008 for athletes and non-athletes were compared. Reported behaviors from 2006 for athletes and non-athletes were compared. Reported behaviors from 2008 for athletes and non-athletes were compared.

To address the fourth research question, athletes and non-athletes responses were analyzed using an Independent Sample t-test and Chi-Square tests in both 2006 and 2008. Of interest, was the athletes or non-athletes responses showed any difference in either attitude responses or reported use responses from 2006 to 2008 in which RDT was subjected to this group.

Specifically, Independent Sample t-test was used to analyze question 15 which allowed for a specific number value in the participant responses. The

participants were asked to give a specific number of alcohol drinks per week. The remaining questions were analyzed by using Chi-Square tests to test for significance. Pearson Chi-Square was used because the data was categorical. Questions 14, 15, 17 (a through l), 18 (a through l), and 33 of reported behavior were compared with the 2006 and 2008 responses, while questions on attitude 19 (a through l), 28 (a through e), 29 (a and b), and 30 were compared separated from the questions on reported behavior. For a complete list of the questions, please refer to the Core Survey in Appendix A.

This design was important because it combined several popular research designs into one study. No study has examined both attitude and reported use before and after the initiation of RDT. Finding answers to the research questions will aid drug prevention by giving insight into the better practices for RDT and the better methods to do research in this area. The triangulation of data will assist researchers in this area with understanding the connection between behavior, attitude and RDT.

### Limitations

This study was limited in scope to the collegiate level and to one small Midwest university. Utilizing every university which uses the Core Alcohol and Drug Survey was not possible in this research due to the time required to get written permission from each university and the resources available for the researcher.

There were limits to the number of years the survey was conducted. The Core Alcohol and Drug Survey was administered only every other year as was standard nation-wide practice (Core Institute, 2009). The student population could vary in the two year period.

The 2006 survey was administered approximately 4 months prior to the initiation of random drug testing, while the 2008 survey was approximately 20 months after random drug testing was initiated. The purposes of the study should still be reflected in the results, as one of the keys to the study is looking at the past 12 month reported use rates. The second survey had to be at least 12 months after the implementation of random drug testing to avoid conflict with survey questions that ask for past 12 month of reported use.

With any survey on a socially unacceptable issue, over-reporting or under-reporting of variables are possible. This study will be difficult to control for external factors such as media influences or new campus drug education programs. Many studies focus uniquely on a specific population. This research focuses solely on college students; it may not be relevant to other groups.

The sample of the athlete group was smaller than the sample of the non-athletes, which was to be expected; though the sample was large enough for the purposes of this exploratory study. Also, the participants from 2006 and 2008 could have been largely different participants; though the researcher has no reason to believe the two populations were largely different from each other based on the demographics presented in Chapter IV. There were several students who could be

“non-traditional,” for example a 53 year-old and several others older than the traditional college age students could have completed the survey.

### Summary

Colleges and universities play a key role in the development of their students. College is a transition time for students and the policy and practices of a university can play a key role in the development of the students and the successful transition from academia to a career. This study was a key to the university understanding prior research and theories and could help in establishing future policies.

This study was unique compared to a review of literature because the survey has addressed attitudes, perceptions and behaviors before and after the initiation of RDT. Potential exists to help administrators and future researchers to help answer questions related to athlete and non-athlete drug testing practices. This study can help address the best practices for administrators and can add to theoretical models that need practical research to help guide future models.



## CHAPTER IV

### FINDINGS AND CONCLUSIONS

#### *Introduction*

The purpose of this study was to test the effectiveness of random drug testing (RDT) on athletes and non-athletes. To examine the usefulness of RDT, the Core Institute survey was administered at the small Midwest university in 2006 and 2008. Data was collected from the respective years to explore what changes, if any, occurred after the implementation of RDT.

The two areas of interest in the research were attitudes and reported behaviors of drug use. The two groups of interest in the study were non-athletes and athletes. The student athletes were randomly tested for the use of drugs, while the non-athletes were not subjected to testing for drugs. The goal of this research was to find what differences, if any, occurred after the implementation of drug testing. Also of interest were differences, if any, in athletes and non-athletes that may have occurred when only athletes were subjected to RDT.

The first three chapters discussed the conflicting research in the field of RDT and the need for this study to help answer questions regarding the effectiveness of RDT. Past research on student attitude indicates that drug use would decrease with the implementation of RDT. While a change of attitude is historically consistent with a change of future behaviors, Azjen (1991) emphasized that attitude was not consistent with behaviors in health areas. Two recent studies had reported use of drugs was unaffected by the implementation of RDT in a school setting (Strelan & Boeckmann,

2006; Yamaguchi, et al., 2003), giving some support to Azjen's (1991) model that emphasized health behaviors may not change even though attitude changed.

The Chapter Four analyses examined the differences in attitude and reported behaviors between athletes and non-athletes both before and after the implementation of RDT for athletes. The specific survey questions that were analyzed in the findings of this chapter were recorded in chapter three in the procedures section.

### *Research Questions*

1. Are there differences in the extent to which college athletes and non-athlete college students report using drugs?
2. Are there differences in the attitudes college athletes and non-athlete college students report about using drugs?
3. Is there a relationship between the extent to which college athletes and non-athlete college students report using drugs and the reported attitudes of these two groups of students?
4. Are there differences between the reported drug use and attitudes about drug use between athletes and non-athlete college students before and after the implementation of RDT when only athletes are randomly drug tested?

### *Findings*

#### *Research Question I: How Did Athletes and Non-Athletes Differ in Reported Behaviors*

Research Question I was answered using Chi-Square tests, which tally the responses of each survey question based on the category. Chi-Square tests were used because the data was categorical in nature allowing for a tally to give the reader clear

understanding of participate responses. To answer the question two Chi-Squares tests were required. The first analysis tested for significant differences in athletes and non-athletes reported responses from 2006. The second analysis tested for significant data differences in athletes and non-athletes reported behavior responses from 2008. The cumulative significant and insignificant responses were then tallied. The “N” was the total sample number. The “df” was the Degrees of Freedom which was the number of groups in the Chi-Square minus one. The percentages of athletes and non-athletes who avoided drug use are given in table 1. The “*p*” values were set at a .05 level.

Table 1

*Comparisons of Athlete and Non-Athlete Reported Drug Use in 2006*

Core Question	Percent Avoiding				
	<i>n</i>	<i>df</i>	Athlete	Non-Athlete	<i>p</i>
14. Think back over the last two weeks. How many times have you had five or more drinks?	177	5	40.0%	62.2%	.038*
17b. Within the last year about how often have you used alcohol (beer, wine, liquor)?	175	7	2.0%	3.2%	.032*
17c. Within the last <u>year</u> about how often have you used marijuana (pot, hash, hash oil)?	175	8	12.0%	18.4%	.009*
17d. Within the last <u>year</u> about how often have you used cocaine (crack, rock, freebase)?	17	7	48.0%	61.6%	.021*
17k. Within the last <u>year</u> about how often have you used steroids?	175	1	95.9%	100.0%	.023*
18a-l During the past <u>30</u> days on how many days did you use all drugs?	2113	6	88.8%	91.3%	.029*

\* *p* < .05 indicates significant difference

There were six analyses showing significant differences in athlete or non-athlete reported behavior in 2006. Survey questions that were significant were the past year use of binge drinking, alcohol, marijuana, cocaine and steroids. Additionally, one survey question showed a significant difference in past 30 day use of overall drug use. Overall, the 2006 data regarding differences in behavior towards drug use between non-athletes and athletes resulted in an overall significantly greater use of drugs in athletes than in non-athletes.

Table 2

*Comparisons of Athlete and Non-Athlete Reported Drug Use in 2008*

Core Question	Percent Avoiding				
	<i>n</i>	<i>df</i>	Athlete	Non-Athlete	<i>p</i>
14. Think back over the last two weeks. How many times have you had five or more drinks?	110	5	31.6%	58.3%	.046*
17a-1 – During the past <u>year</u> what was your overall drug use?	1318	8	82.9%	86.8%	.014*
18a-1 – During the past <u>30</u> days what was your overall drug use?	1306	6	88.3%	89.3%	.012*
18b – Within the past <u>30 days</u> about how often have you used alcohol (beer, wine, liquor)?	110	5	18.4%	26.4%	.008*

\*  $p < .05$  indicates significant difference

There were four analyses showing significant differences in athlete or non-athlete reported behavior in 2008. In all four significant cases non-athletes reported using drugs less frequently than athletes. Survey questions that were significant were binge drinking in the last two weeks, the past year overall use drugs, past 30 day overall drug use and

past 30 day use of alcohol. Overall, the 2008 data regarding differences in behavior towards drug use between non-athletes and athletes resulted in an overall significantly greater use of drugs in athletes than in non-athletes.

In total there were 10 significantly different Chi-Square results that showed non-athletes reported using fewer drugs than their athlete counterparts. The results indicated overall less reports of drug use by non-athletes. Athletes reported higher drug use in all 10 significant survey questions.

The findings from Research Question I showed that non-athletes reported using drugs significantly less often than athletes in 10 out of 84 survey questions. There were 74 survey questions where athletes and non-athletes reported statistically similar usage rates. Overall, non-athletes reported less use than their athlete counterparts.

#### *Research Question II: Comparison of Athlete and Non-Athlete Attitude*

Research Question II was answered using Chi-Square tests. To answer the question using Chi-Squares tests required two analyses. The first analysis tested for significant differences in athletes and non athletes attitudes from 2006. The second analysis tested for significant data differences in athletes and non-athletes attitudes from 2008. The significant and insignificant responses were then tallied.

Table 3

*Comparisons of Athlete and Non-Athlete Attitude 2006*

Core Question	Percent Avoiding				
	<i>n</i>	<i>df</i>	Athlete	Non-Athlete	<i>p</i>
19a – I How often do you think the average student on your campus uses all drugs?	2089	8	46.9%	48.0%	.001*
28a –On this campus, drinking is a central part in the social life for male students?	172	1	8.0%	20.5%	.047*
28b –On this campus, drinking is a central part in the social life for female students?	173	1	18.0%	35.0%	.027*
28e –On this campus, drinking is a central part in the social life for athletes?	172	1	18.0%	37.4%	.013*
28a - e –On this campus, drinking is a central part in the social life of campus groups?	861	1	37.2%	51.6%	<.001*
29a – Does the social atmosphere on this campus promote alcohol use?	175	1	40.8%	69.0%	.001*
29a - b –Does the social atmosphere on this campus promote alcohol and drug use?	349	1	61.9%	80.2%	.001*

\*  $p < .05$  indicates significant difference

There were seven analyses showing significant differences in athlete or non-athlete attitude in 2006. Survey questions that were significant included the average student use, and the belief that drinking was central for males, females, athletes, and all campus groups. Also significant was the perception that campus promoted alcohol and alcohol and drug use. Overall, the 2006 data regarding differences in attitude towards

drug use between non-athletes and athletes resulted in an overall perception of greater use of drugs in athletes than in non-athletes.

Table 4

*Comparisons of Athlete and Non-Athlete Attitude 2008*

Core Question	Percent Avoiding				
	<i>n</i>	<i>df</i>	Athlete	Non-Athlete	<i>p</i>
28b – On this campus, drinking is a central part in the social life for faculty?	106	1	70.1%	86.8%	.047*
28e – On this campus, drinking is a central part in the social life for alumni?	106	1	52.6%	72.1%	.044*

\* indicates statistically significant differences.

There were two analyses showing significant differences in athlete or non-athlete attitude in 2008. Survey questions that were significant included the average student use, and the belief that drinking was central for males, females, athletes, and all campus groups. Also significant was the perception that campus promoted both alcohol and alcohol and drug use. Overall, the 2008 data regarding differences in attitude towards drug use between non-athletes and athletes resulted in an overall perception of greater use of drugs in athletes than in non-athletes.

There were seven statistics that were shown to be significant from the 2006 data. In all seven significant cases, non-athletes reported attitudes of using drugs less frequently than athletes. There were two statistics that were shown to be significant from the 2008 data. In both significant cases non-athletes reported attitudes of using drugs less frequently than athletes.

In total for 2006 and 2008 there were nine significantly different Chi-Square results that showed non-athletes reported using fewer drugs than their athlete counterparts. All nine analyses showed significantly less perception of use by non-athletes, it is important to note 13 variables were shown to be insignificant. Overall perceptions indicate a tendency of non-athletes to perceive less use of drugs than athletes. Athletes indicated perceptions of more drug use.

The findings from Research Question II showed that non-athletes had attitudes of less drug use on campus. There were nine survey questions in which non-athletes attitudes were significantly lower than athletes. Perceptions existed that athletes used more drugs than did non-athletes. Overall, non-athletes perceived less use than their athlete counterparts.

*Research Question III: Comparison of Athletes and Non-Athletes Reported Drug Use and Attitude*

Research Question III examined whether there was a difference in non-athlete and athlete responses for either attitude or reported behaviors toward drug use. This question was answered by comparing the significant responses from Research Question I, reported drug use, and Research Question II, attitudes toward drug use. Table 5 was used to assist with comparisons.

For each survey question, a tally mark was placed where the significance occurred. A tally was placed in the “Insignificant” column for each question that was reported statistically similar. A tally is placed in the Non-Athlete column for each survey question that showed significantly less ratings for Non-Athletes.



*Table 5 – Compilation of Research Questions 1, 2, & 3*

*Tally of Chi-Square Tests for Reported Behaviors and Attitudes*

	Which Group Avoided or Perceived Less Use?			Total
	Insignificant	Non-Athletes	Athletes	
Reported Behavior	74	10	0	84
Attitude	13	9	0	22

There were 10 variables that were statistically significant when examining non-athlete and athlete reported behaviors regarding drug use. In each of the significant variables, non-athletes reported lower usage of drugs than their athlete counterparts. There were 74 cases where the Chi-Square did not find a significant difference in reported behaviors between the athletes and non-athletes. There were zero cases where non-athletes reported using drugs more than athletes.

Similarly, when reporting significant results on attitude toward drug use, non-athletes perceived a lower usage rates in nine significant findings. Non-athletes reported both lower usage rates and lower attitudes of use than did their athlete counterparts. There were 13 cases where the Chi-Square did not find a significant difference in attitudes between the athletes and non-athletes.

In general, the findings from Research Question III shows that reported behavior and attitudes were related. Athletes reported more use than non-athletes, which was consistent with attitudes that athletes used more. Similarly, non-athletes reported less use than athletes, which was consistent with attitudes that non-athletes used less.

#### *Research Question IV: Non-Athletes and Athletes Reported Behavior and Attitude*

Research Question IV sought to find the differences between non-athletes and athletes on reported behaviors and attitudes toward drug use before and after the implementation of RDT. A comparison of non-athletes and athletes reported behaviors toward drug use as well as a comparison of non-athletes and athletes attitudes towards drug use was required to answer this question. The 2006 data was used to analyze reported behaviors and attitudes before the implementation of RDT. The 2008 data was used to analyze reported behaviors and attitudes after the implementation of RDT for athletes only.

Chi-Square analyses were used to find the number of significant changes in non-athlete reported behaviors from the 2006 data and the 2008 data. These were compared with the number of significant changes in athlete reported behaviors from the 2006 data and the 2008 data. Also compared was the number of significant changes in non-athlete attitudes from the 2006 data and the 2008 data with the number of significant changes in athlete attitudes from the 2006 data and the 2008 data.

The tables that follow represent the same group of participants (non-athlete or athlete), with the same test variables (attitude or reported behavior), with a both years (2006 and 2008). This is distinct from the tables above that compared the groups (non-athlete and athlete) with the same year (2006 or 2008). This method was required to answer the complex research questions.

Table 6

*Comparison of Non-Athlete Attitude changes from 2006 to 2008*

Core Question	Perceived Avoiding				
	<i>n</i>	<i>df</i>	2006	2008	<i>p</i>
19a – 1 – How often do you think the average student on your campus uses all drugs?	2343	8	46.9%	42.1%	<.001*
28a –On this campus, drinking is a central part in the social life for male students?	191	1	20.5%	5.8%	.007*
28b –On this campus, drinking is a central part in the social life for female students?	192	1	35.0%	14.5%	.002*
28e – On this campus, drinking is a central part in the social life for athletes?	191	1	37.4%	13.2%	<.001*
28a-e –On this campus, drinking is a central part in the social life for campus groups?	953	1	51.6%	38.3%	<.001*
29a - b –Does the social atmosphere on this campus promote alcohol and drug use?	2113	1	80.2%	69.3%	.015*

\*  $p < .05$  indicates significant difference

There were six analyses that showed a significant difference in non-athlete attitudes. Survey questions that were significant included the average student use, and the belief that drinking was central for males, females, athletes, and all campus groups. Also significant was the perception that campus promoted alcohol and drug use. Overall, the data regarding differences in attitude towards drug use of non-athletes resulted in greater overall perception in 2008.

*Table 7*

*Non-Athlete Tally Results of Chi-Square Tests for Attitudes*

	Insignificant Data	2006	2008	Total
Attitudes	5	6	0	11

Table 7 represents the attitudinal responses for non-athletes. The table has a tally for each survey question. The table also tallies each survey question into a category of either insignificant or significant. For significant data, a tally was placed for either 2006 or 2008. A tally was placed in the year where significantly more avoidance was perceived. In 2006 participants reported significantly less attitude of usage in six out of 11 surveys questions. The data from 2008 had no responses that showed lower attitudes than 2006.

Table 7 indicates that non-athletes attitudes of drug use increased after 2006. This means that from 2006 to 2008 non-athletes overall attitudes indicated that more drug use occurred on campus. Responses indicated that attitudes of drug use increased in 2008 in 6 out of 11 of the survey questions. There were five survey questions that indicated insignificant data. The insignificant findings indicate no change in attitude from 2006 to 2008.

Table 8

*Comparison of Non-Athlete Reported Behaviors from 2006 to 2008*

Core Question	Perceived Avoiding				
	<i>n</i>	<i>df</i>	2006	2008	<i>p</i>
17b – Within the last <u>year</u> how often have you used alcohol (beer, wine, liquor)	198	8	17.5%	12.5%	.049*

\*  $p < .05$  indicates significant difference

There was one analysis that showed a significant difference in non-athlete reported behavior. The survey question that was significant was the reported behavior for past year of alcohol use. Overall, the data regarding non-athletes differences resulted in greater use of drugs in 2006 in one survey question, while 41 survey questions showed no statistical differences.

Table 9

*Non-Athlete Tally Results of Chi-Square Tests for Reported Behaviors*

Insignificant Data		2006	2008	Total
Reported Behavior	41	1	0	42

Table 9 represents the reported behaviors for non-athletes. The table has a tally for each survey question. The table also tallies each survey question into a category of either insignificant or significant. For significant data, a tally was placed 2006 or 2008. A tally was placed in the year where significantly more avoidance was reported. In 2006 participants reported significantly less reported behavior in one out of 42 surveys

questions. The data from 2008 had no responses that showed lower reported behaviors than 2006.

Table 9 indicates that non-athletes reports of drug use increased after 2006 in one survey question. This means that from 2006 to 2008 non-athletes reported behaviors indicated that more drug use occurred on campus in two survey questions. Responses indicated that reported behavior of drug use increased in 2008 in one out of 42 of the survey questions. There were 41 survey questions that indicated insignificant data. The insignificant findings indicate no change in reported behaviors from 2006 to 2008.

Table 10

*Comparison of Athlete Attitude changes from 2006 to 2008*

Core Question	Perceived Avoiding				
	<i>n</i>	<i>df</i>	2006	2008	<i>p</i>
19a-l – How often do you think the average student on your campus uses all drugs?	1050	8	48.0%	42.1%	<.001*
28a-e –Drinking is a central part in the social life for campus groups?	1413	1	48.0%	35.0%	<.001*
29a-b –Does the social atmosphere on this campus promote alcohol and drug use?	573	1	67.9%	75.5%	.048*

\*  $p < .05$  indicates significant difference

There were three analyses that showed a significant difference in athlete attitude. Survey questions that were significant included the average student use for all drugs, and the belief that drinking was central for all campus groups. Also significant was the perception that campus promoted alcohol and drug use. Overall, the non-athletes

surveyed regarding differences in attitude towards drug use in 2006 and 2008 resulted in an overall perception of greater use of drugs in 2006 than in 2008.

Table 11

*Athlete Tally Results of Chi-Square Tests for Attitudes*

	Insignificant Data	2006	2008	Total
Attitude	8	3	0	11

Table 10 represents the attitudinal responses for athletes. The table has a tally for each survey question. The table also tallies each survey question into a category of either insignificant or significant. For significant data, a tally was placed 2006 or 2008. A tally was placed in the year where significantly more avoidance was perceived. In 2006 participants reported significantly less attitude in three out of 11 surveys questions. The data from 2008 had no responses that showed lower attitudes than 2006.

Table 10 indicates that non-athletes attitudes of drug use increased after 2006. This means that from 2006 to 2008 non-athletes overall attitudes indicated that more drug use occurred on campus. Responses indicated that attitudes of drug use increased in 2008 in three out of 11 of the survey questions. There were eight survey questions that indicated insignificant data. The insignificant findings indicate no change in attitude from 2006 to 2008.

Table 12

*Comparison of Athlete Reported Behaviors from 2006 to 2008*

Core Question	Perceived Avoiding				
	N	df	2006	2008	<i>p</i>
17b – Within the last <u>year</u> about how often have you used alcohol (beer, wine, liquor)?	1052	6	88.8%	88.3%	<.001*

\*  $p < .05$  indicates significant difference

There was one analysis that showed a significant difference in athlete reported behavior. The survey question that was significant was the reported behavior for past year of alcohol use. Overall, the data regarding athlete's differences resulted in greater use of drugs in 2006 in one survey question, while 41 survey questions showed no statistical differences.

Table 13

*Athlete Tally Results of Chi-Square Tests for Reported Behaviors*

	Insignificant Data	2006	2008	Total
Reported Behavior	41	1	0	42

Table 12 represents the reported behaviors for athletes. The table has a tally for each survey question. The table also tallies each survey question into a category of either insignificant or significant. For significant data, a tally was placed 2006 or 2008. A tally was placed in the year where significantly more avoidance was reported. In 2006 participants reported significantly less reported behavior in one of the 42 surveys



questions. The data from 2008 had no responses that showed lower reported behaviors than 2006.

Table 12 indicates that non-athletes reports of drug use increased after 2006 in one of the survey questions. This means that from 2006 to 2008 athletes overall reported behaviors indicated that drug use occurred nearly equally in 2006 and in 2008. Responses indicated that reported drug use did not increase in 2008 in 41 of the survey questions. The 41 insignificant findings indicate very little change in reported behaviors from 2006 to 2008.

Research Question IV examined non-athletes attitude and reported behavior from 2006 to 2008. Non-athletes perceived lower usage rates in 2006 on six survey questions. Non-athletes reported behavior relatively consistently from 2006 to 2008. Two survey questions showed lower reported usage in 2006. Overall, attitudes were influenced more heavily from 2006 to 2008 with six out of 11 survey questions describing an increase in perceived drug use; two out of 42 survey questions on reported behavior were significant showing less use in 2006, which indicates an increase in reported behavior in 2008. Attitudes and reported behaviors for non-athletes showed increases from 2006 to 2008. The increases indicate that RDT was not influential on this population of non-athletes for reducing either attitudes of drug use or reported behavior.

Research question IV examined athlete's attitude and reported behavior from 2006 to 2008. Athletes perceived lower usage rates in 2006 compared to 2008 on three survey questions. Athletes reported behavior did not change from 2006 to 2008. Despite the implementation of RDT after the 2006 survey, there was only one significant change

in the 42 survey question on reported drug use. For athletes, attitudes of drug use increased from 2006 to 2008, despite the implementation of RDT. This finding indicates that RDT was ineffective as a deterrent strategy.

Non-athletes were not subjected to RDT, while athletes were in a RDT program. Non-athletes reported significantly higher use rates on two survey questions, indicating that drug use may have gone up slightly for non-athletes from 2006 to 2008. Simultaneously, athletes showed no changes in reported behaviors. RDT at this university has produced no influence in the reported use of drugs from 2006 to 2008. Athletes continued to use drugs at the same rate, despite the implementation of RDT.

### Conclusions

This study showed that RDT at this small Midwest university produced very little change in reported behaviors in a multitude of survey questions despite intentions by administrators to use RDT as a deterrent strategy. Reported behaviors for this study were shown to be consistent with past research indicating that RDT does not reduce drug use. These findings are significant because RDT is implemented specifically as a deterrent method to decrease athlete drug use.

Not only did reported behavior increase, but perceptions of drug use increased after the implementation of RDT. Attitudes toward drug use actually became more favorable that more drugs were being used. The findings on attitudes toward drug use increasing after the implementation is contrary to past research that suggests RDT would influence attitude (Albrecht, Anderson, McGraw, McKeag & Hough, 1992). Past research on attitudes toward drug use had indicated that RDT should be effective when

administered to athletes (Issari & Coombs, 1998). Furthermore, perceptual research has indicated that RDT is a necessity in the prevention of performance enhancing drugs (Albrecht, et al., 1992).

The attitude research laid the ground work for beginning RDT. The initial perceptual studies were thought to be effective at deterring drug use; however, research on reported drug use showed that RDT was ineffective at deterring use. It was possible the consequences were not serious enough as some challenged and need to continue to be challenged by researchers as this study had verified previous research has shown RDT has not decreased drug use (Strelan & Boeckmann; Yamaguchi, Johnston, & O'Malley, 2003). Attitudes toward drug use were inconsistent with past research on attitudes when RDT is presented; however, this study was unique studying attitude over a period of time when RDT was actually presented to the population.

There is some speculation as to why RDT is ineffective. There is a possibility that athletes have no concern for getting schools give a warning for first offense and up to four offenses before expulsion from the team or university. Also, students may feel they can get away with drug use without being caught due to masking agents or using drugs that are not tested.

### Implications

The implications of the ineffectiveness of RDT reach throughout many organizations. First, college administrators need to understand RDT deficiencies to better understand how to prevent drug use. Additionally, athletic trainers, coaches, athletic directors, school administrators and others who implement drug testing to student athletes

need to understand the ineffectiveness of RDT. Finally, communities and parents can be better educated by both research and administrators so that effective and appropriate policies can be made at institutions.

The addictive properties and the harmful side effects of drug use make this study important for university administrators and for administrators at other stages of life.

Administrators in these venues should be weary of adding RDT as a new program. These administrators should examine existing RDT programs for possible improvements.

University officials should consider this problem with an open mind. It is important to carefully look at the recent research indicating that RDT is not influencing reports of drug use. Considerations for the needs of an individual university are important for administrators. Administrators may feel that RDT is a proactive measure, but this may not be the case. RDT could be considered a reactive measurement with student discipline occurring in stages too late to prevent use.

The impact of these findings can reach throughout the United States high schools and colleges. Additionally, other countries have been following the lead of the United States to initiate drug testing in schools making this a worldwide issue. With the growing trend to initiate RDT in schools, there needs to be more consideration for research demonstrating the effectiveness of the program.

The NCAA needs to consider these results for future RDT practices. The primary goal of the NCAA and most collegiate programs is to discourage drug use, considerations for the effectiveness need to be considered by administrators (NCAA, November 28, 2010). The NCAA RDT policy may not be living up to the primary goal of discouraging

drug use; therefore, it would benefit the NCAA to have an open mind about changing policies regarding RDT.

Future practitioners should consider the results from this study and recent research by Strelan and Boeckmann (2006) and Yamaguchi, et al., (2003). Administrators need to reconsider why random drug testing is given to athletes, either as a deterrent or as a way to help students who are addicted. Administrators should consider RDT to be a reactionary approach and should first consider more proactive methods as the best option for reducing drug use.

#### Recommendations

The recommendation for administrators at all levels is to implement proactive methods for drug deterrence. Proactive measures that have been cited as effective in research are student led initiatives coupled with discussion allowing both the pros and cons of using drugs. Though the authoritative style of “Say No to Drugs” is shown to be ineffective at deterrence, training student leaders can be an effective tool for schools considering a proactive method of reducing drug use (Sprague, 2008).

The study shows that the program at this small Midwest university is ineffective at decreasing drug use. This university should consider removing the existing RDT program in pursuit of other options. The university should establish better peer led programs and not rely on a threat of RDT as a main prevention method. This university should consider an additional examination of the Core Institute data base from 2004 and 2010 to look for additional patterns that may be applicable.

Currently, athletes are given one day notice prior to taking a drug test. First time penalties could include a warning and or a small suspension. When drug testing is implemented at this university or other institutions, more stringent penalties should be considered.

The NCAA should modify the current RDT programs and implement more proactive peer led programs to decrease drug use. The NCAA should research the effectiveness of their RDT programs through the surveying of reported behaviors of athletes mandated to RDT programs and those not mandated to RDT. Using reported behaviors before and after RDT should prove to be a more effective method of data collection. The NCAA could work with the Core Institute and universities who have implemented RDT to run similar research on effectiveness of their prevention programs.

In both the previous research (Strelan & Boeckmann, 2006; Yamaguchi, et al., 2003) and the current study conclusions were that RDT does not deter future drug use. In a time when budgets are tight and the cost of RDT programs are expensive, administrators may choose to remove some of their budgets currently used for RDT. Administrators may use the remaining budget to save for other purposes. Administrators may divert resources saved into preventative peer led programs, other programs which may prevent drug use, or completely different educational programs.

Administrators need to consider why these programs are ineffective. Current programs do not detect all drugs or do not detect the latest drugs. Additionally, current programs may test small percentages of athletes. The percentage of athletes chosen to participate in RDT may be too small; therefore, the students may perceive they will not

be chosen to participate in RDT and risk continued use of drugs. Also, students may perceive that they will not have harmful side effects or get addicted to the drugs and continue with the drug use.

Administrators should consider that RDT may not influence the use of drugs when making decisions to begin RDT in their school. Administrators should consider their reasons for implementing RDT and should educate their constituents about the recent research showing that RDT is not a preventative measure. Whenever possible, administrators should consider proactive methods to fight drug use.

The medical field should continue to update the accuracy of drug testing. If more accurate testing is developed that could detect each drug ingested, student athletes may feel more comfortable that the playing field is level. This could alleviate pressure to use drugs to compete for a starting spot with someone who might be using PEDs. This would also eliminate pressure to use drugs because perceptions exist that opponents may be using PEDs.

Though professional sports have a different system of drug testing, national and world governing bodies still provide RDT to their athletes. These professional organizations should consider the impact of this study. It may be plausible that these organizations are too reactive to drug use and need a more proactive stance to protect their athletes.

### Future Research

Future research should examine the attitudes of other groups. Coaches, athletic trainers, athletic directors and other sports administrator's attitudes about the use of

performance-enhancing drugs could benefit research regarding the effectiveness of RDT. The differing attitudes of administrators and athletes could provide insight into why drug testing programs are implemented.

Research examining the amounts of masking agents used by athletes to avoid a positive drug test will benefit the future decision making of administrators. Masking agents are a potential way to avoid testing positive. This method has side effects and is used to cover-up prohibited drugs. This research should examine how many people are taking the masking agents and what types of masking agents are being used. It is possible that implementing RDT only causes students to educate themselves on how to avoid testing positive through methods such as masking agents and using drugs that will not be tested. If masking agents are being used to cover up drug use when RDT is present then RDT may actually be doing harm to the student athletes because of the negative side effects of the masking agents.

Researchers may choose to use additional years of data collection to look for long-term patterns of behavior and the relationship to RDT. For example, if drug testing was implemented in 2005, a school may choose to use data from 2000 to 2010. This would provide more data to examine long-term patterns of the effectiveness of RDT with five years of data before and five years of data after RDT was implemented. There is potential for the effectiveness of RDT to change over time. The effects of RDT may have no effect on behavior initially as with the current study, but may cause a change of behavior over a longer period of time. Additionally, the implementation of RDT may cause those interested in using drugs to educate themselves more thoroughly and to use



more drugs long-term through masking agent possibilities. The question of long-term effects of the implementation of RDT on future drug use is important and should be considered in future research.

Universities are diverse, and the university used in this survey was a small private Midwest university. Universities that administer different drug and alcohol surveys could replicate this study with either the Core Institute survey or other instruments used at their institution. Specifically, university administrators could give future researchers permission to use the Core Institute data and additional data sources to more formally address future replications.

High schools use various surveys to address drug and alcohol use could use this method before and after the implementation of RDT. RDT is a relatively new deterrence method in high schools and colleges. The survey method used in the study could provide good data on the effectiveness of RDT.

The value of drug testing at collegiate championship events could be beneficial to study prevention of drug use. A future study could examine participant reported behaviors of drug use at national championship events. Comparing reported behaviors of drug use and levels of drug testing (such as mandatory, random, or none) could be a useful way to determine the success of championship drug testing. It would be of interest to examine participants reported behaviors leading up to the national championship events that either have drug testing or do not have drug testing. This would provide insight into the effectiveness of championship drug testing.

There are many recommendations and implementations that researchers can use to further this field of study. Future research has options to strengthen data relating to the effectiveness of RDT on athletes and non-athletes. Administrators are given recommendations for prevention efforts in their schools. The area of RDT and drug prevention should continue to be explored to provide our schools with the best possible outcomes for students.

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Appendix A  
Core Alcohol and Drug Survey





**17. Within the last year  
about how often have  
you used...**  
(mark one for each line)

	Did not use	Once/year	6 times/year	Once/month	Twice/month	Once/week	3 times/week	5 times/week	Every day
a. Tobacco (smoke, chew, snuff) . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
b. Alcohol (beer, wine, liquor) . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
c. Marijuana (pot, hash, hash oil) . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
d. Cocaine (crack, rock, freebase) . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
e. Amphetamines (diet pills, speed) . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
f. Sedatives (downers, ludes) . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
g. Hallucinogens (LSD, PCP) . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
h. Opiates (heroin, smack, horse) . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
i. Inhalants (glue, solvents, gas) . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
j. Designer drugs (ecstasy, MDMA) . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
k. Steroids . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
l. Other illegal drugs . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**19. How often do you  
think the average student  
on your campus uses...**  
(mark one for each line)

	Never	Once/year	6 times/year	Once/month	Twice/month	Once/week	3 times/week	5 times/week	Every day
a. Tobacco (smoke, chew, snuff) . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
b. Alcohol (beer, wine, liquor) . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
c. Marijuana (pot, hash, hash oil) . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
d. Cocaine (crack, rock, freebase) . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
e. Amphetamines (diet pills, speed) . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
f. Sedatives (downers, ludes) . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
g. Hallucinogens (LSD, PCP) . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
h. Opiates (heroin, smack, horse) . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
i. Inhalants (glue, solvents, gas) . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
j. Designer drugs (ecstasy, MDMA) . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
k. Steroids . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
l. Other illegal drugs . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**20. Where have you  
used...**  
(mark all that apply)

	Never used	On campus	Residence events	Residence hall	Bar/sorority	Where you live	In a car	Private parties	Other
a. Tobacco (smoke, chew, snuff) . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
b. Alcohol (beer, wine, liquor) . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
c. Marijuana (pot, hash, hash oil) . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
d. Cocaine (crack, rock, freebase) . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
e. Amphetamines (diet pills, speed) . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
f. Sedatives (downers, ludes) . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
g. Hallucinogens (LSD, PCP) . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
h. Opiates (heroin, smack, horse) . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
i. Inhalants (glue, solvents, gas) . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
j. Designer drugs (ecstasy, MDMA) . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
k. Steroids . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
l. Other illegal drugs . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**22. Have any of your family had alcohol or other  
drug problems: (mark all that apply)**

- |                                  |  |                                |
|----------------------------------|--|--------------------------------|
| <input type="radio"/> Mother     | <input type="radio"/> Brothers/sisters | <input type="radio"/> Spouse   |
| <input type="radio"/> Father     | <input type="radio"/> Mother's parents | <input type="radio"/> Children |
| <input type="radio"/> Stepmother | <input type="radio"/> Father's parents | <input type="radio"/> None     |
| <input type="radio"/> Stepfather | <input type="radio"/> Aunts/uncles     |                                |

**18. During the past 30 days  
on how many days  
did you have:**  
(mark one for each line)

	0 days	1-2 days	3-5 days	6-9 days	10-19 days	20-29 days	All 30 days
a. Tobacco (smoke, chew, snuff) . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
b. Alcohol (beer, wine, liquor) . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
c. Marijuana (pot, hash, hash oil) . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
d. Cocaine (crack, rock, freebase) . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
e. Amphetamines (diet pills, speed) . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
f. Sedatives (downers, ludes) . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
g. Hallucinogens (LSD, PCP) . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
h. Opiates (heroin, smack, horse) . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
i. Inhalants (glue, solvents, gas) . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
j. Designer drugs (ecstasy, MDMA) . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
k. Steroids . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
l. Other illegal drugs . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**21. Please indicate how often  
you have experienced  
the following due to  
your drinking or drug use  
during the last year...**  
(mark one for each line)

	Never	Once	Twice	3-5 times	6-9 times	10 or more times
a. Had a hangover . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
b. Performed poorly on a test or important project . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
c. Been in trouble with police, residence hall, or other college authorities . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
d. Damaged property, pulled fire alarm, etc. . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
e. Got into an argument or fight . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
f. Got nauseated or vomited . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
g. Driven a car while under the influence . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
h. Missed a class . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
i. Been criticized by someone I know . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
j. Thought I might have a drinking or other drug problem . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
k. Had a memory loss . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
l. Done something I later regretted . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
m. Been arrested for DWI/DUI . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
n. Have been taken advantage of sexually . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
o. Have taken advantage of another sexually . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
p. Tried unsuccessfully to stop using. . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
q. Seriously thought about suicide. . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
r. Seriously tried to commit suicide . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
s. Been hurt or injured. . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**23. If you volunteer any of your time on or off campus  
to help others, please indicate the approximate  
number of hours per month and principal activity:**

- |   |  |
|---|--|
| <input type="radio"/> Don't volunteer, or<br>less than 1 hour | <input type="radio"/> 10-15 hours      |
| <input type="radio"/> 1-4 hours                               | <input type="radio"/> 16 or more hours |
| <input type="radio"/> 5-9 hours                               | Principal volunteer activity is:       |

**24. Within the last year to what extent have you participated in any of the following activities?**  
(mark one for each line)

	Not involved	Attended	Active involvement, non-leader	Leadership position
a. Intercollegiate athletics	<input type="radio"/>	n/a	<input type="radio"/>	<input type="radio"/>
b. Intramural or club sports	<input type="radio"/>	n/a	<input type="radio"/>	<input type="radio"/>
c. Social fraternities or sororities	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
d. Religious and interfaith groups	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
e. International and language groups	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
f. Minority and ethnic organizations	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
g. Political and social action groups	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
h. Music and other performing arts groups	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
i. Student newspaper, radio, TV, magazine, etc.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**25. In the first column, indicate whether any of the following have happened to you within the last year while you were in and around campus. If you answered yes to any of these items, indicate in the second column if you had consumed alcohol or other drugs shortly before these incidents.**

	Happened to you			Consumed alcohol or drugs	
	yes	no		yes	no
a. Ethnic or racial harassment	<input type="radio"/>	<input type="radio"/>	→	<input type="radio"/>	<input type="radio"/>
b. Threats of physical violence	<input type="radio"/>	<input type="radio"/>		<input type="radio"/>	<input type="radio"/>
c. Actual physical violence	<input type="radio"/>	<input type="radio"/>		<input type="radio"/>	<input type="radio"/>
d. Theft involving force or threat of force	<input type="radio"/>	<input type="radio"/>	If yes	<input type="radio"/>	<input type="radio"/>
e. Forced sexual touching or fondling	<input type="radio"/>	<input type="radio"/>	→	<input type="radio"/>	<input type="radio"/>
f. Unwanted sexual intercourse	<input type="radio"/>	<input type="radio"/>		<input type="radio"/>	<input type="radio"/>

**26. How do you think your close friends feel (or would feel) about you...**  
(mark one for each line)

	Don't disapprove	Disapprove	Strongly disapprove
a. Trying marijuana once or twice	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
b. Smoking marijuana occasionally	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
c. Smoking marijuana regularly	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
d. Trying cocaine once or twice	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
e. Taking cocaine regularly	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
f. Trying LSD once or twice	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
g. Taking LSD regularly	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
h. Trying amphetamines once or twice	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
i. Taking amphetamines regularly	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
j. Taking one or two drinks of an alcoholic beverage (beer, wine, liquor) nearly every day	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
k. Taking four or five drinks nearly every day	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
l. Having five or more drinks in one sitting	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
m. Taking steroids for body building or improved athletic performance	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**27. Do you believe that alcohol has the following effects?**  
(mark one for each line)

	yes	no
a. Breaks the ice	<input type="radio"/>	<input type="radio"/>
b. Enhances social activity	<input type="radio"/>	<input type="radio"/>
c. Makes it easier to deal with stress	<input type="radio"/>	<input type="radio"/>
d. Facilitates a connection with peers	<input type="radio"/>	<input type="radio"/>
e. Gives people something to talk about	<input type="radio"/>	<input type="radio"/>
f. Facilitates male bonding	<input type="radio"/>	<input type="radio"/>
g. Facilitates female bonding	<input type="radio"/>	<input type="radio"/>
h. Allows people to have more fun	<input type="radio"/>	<input type="radio"/>
i. Gives people something to do	<input type="radio"/>	<input type="radio"/>
j. Makes food taste better	<input type="radio"/>	<input type="radio"/>
k. Makes women sexier	<input type="radio"/>	<input type="radio"/>
l. Makes men sexier	<input type="radio"/>	<input type="radio"/>
m. Makes me sexier	<input type="radio"/>	<input type="radio"/>
n. Facilitates sexual opportunities	<input type="radio"/>	<input type="radio"/>

**28. On this campus, drinking is a central part in the social life of the following groups:**  
(mark one for each line)

	yes	no
a. Male students	<input type="radio"/>	<input type="radio"/>
b. Female students	<input type="radio"/>	<input type="radio"/>
c. Faculty/staff	<input type="radio"/>	<input type="radio"/>
d. Alumni	<input type="radio"/>	<input type="radio"/>
e. Athletes	<input type="radio"/>	<input type="radio"/>
f. Fraternities	<input type="radio"/>	<input type="radio"/>
g. Sororities	<input type="radio"/>	<input type="radio"/>

**29. Campus environment:** (mark one for each line)

	yes	no
a. Does the social atmosphere on this campus promote alcohol use?	<input type="radio"/>	<input type="radio"/>
b. Does the social atmosphere promote other drug use?	<input type="radio"/>	<input type="radio"/>
c. Do you feel safe on this campus?	<input type="radio"/>	<input type="radio"/>

**30. Compared to other campuses with which you are familiar, this campus' use of alcohol is...** (mark one)

Greater than other campuses	<input type="radio"/>
Less than other campuses	<input type="radio"/>
About the same as other campuses	<input type="radio"/>

**31. Housing preferences:** (mark one for each line)

	yes	no
a. If you live in university housing, do you live in a designated alcohol-free/drug-free residence hall?	<input type="radio"/>	<input type="radio"/>
b. If no, would you like to live in such a residence hall unit if it were available?	<input type="radio"/>	<input type="radio"/>

**32. To what extent do students on this campus care about problems associated with...**  
(mark one for each line)

- |   | Not at all            | Slightly              | Somewhat              | Very much             |
|---|-----------------------|-----------------------|-----------------------|-----------------------|
| a. Alcohol and other drug use               | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| b. Campus vandalism                         | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| c. Sexual assault                           | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| d. Assaults that are non-sexual             | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| e. Harassment because of gender             | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| f. Harassment because of sexual orientation | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| g. Harassment because of race or ethnicity  | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| h. Harassment because of religion           | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

**33. To what extent has your alcohol use changed within the last 12 months?**

- Increased ☐
- About the same ☐
- Decreased ☐
- I have not used alcohol ☐

**34. To what extent has your illegal drug use changed within the last 12 months?**

- Increased ☐
- About the same ☐
- Decreased ☐
- I have not used drugs ☐

**35. How much do you think people risk harming themselves (physically or in other ways) if they... (mark one for each line)**

- |  | No risk               | Slight risk           | Moderate risk         | Great risk            | Can't say             |
|--|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| a. Try marijuana once or twice   | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| b. Smoke marijuana occasionally  | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| c. Smoke marijuana regularly   | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| d. Try cocaine once or twice   | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| e. Take cocaine regularly  | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| f. Try LSD once or twice   | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| g. Take LSD regularly  | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| h. Try amphetamines once or twice  | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| i. Take amphetamines regularly   | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| j. Take one or two drinks of an alcoholic beverage (beer, wine, liquor) nearly every day | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| k. Take four or five drinks nearly every day   | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| l. Have five or more drinks in one sitting   | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| m. Take steroids for body building or improved athletic performance                      | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| n. Consume alcohol prior to being sexually active  | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| o. Regularly engage in unprotected sexual activity with a single partner                 | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| p. Regularly engage in unprotected sexual activity with multiple partners                | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

**36. Mark one answer for each line:**

- |  | yes                   | no                    |
|--|-----------------------|-----------------------|
| a. Did you have sexual intercourse within the last year?             | <input type="radio"/> | <input type="radio"/> |
| <b>If yes, answer b and c below.</b>                                 |                       |                       |
| b. Did you drink alcohol the last time you had sexual intercourse?   | <input type="radio"/> | <input type="radio"/> |
| c. Did you use other drugs the last time you had sexual intercourse? | <input type="radio"/> | <input type="radio"/> |

**37. During the past 30 days, to what extent have you engaged in any of the following behaviors?**  
(mark one for each line)

- |  | Zero times            | One time              | Two times             | 3-5 times             | 6-9 times             | 10 or more times      |
|--|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| a. Refused an offer of alcohol or other drugs  | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| b. Bragged about your alcohol or other drug use  | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| c. Heard someone else brag about his/her alcohol or other drug use   | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| d. Carried a weapon such as a gun, knife, etc. (do not count hunting situations or weapons used as part of your job) | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| e. Experienced peer pressure to drink or use drugs   | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| f. Held a drink to have people stop bothering you about why you weren't drinking                                     | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| g. Thought a sexual partner was not attractive because he/she was drunk  | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| h. Told a sexual partner that he/she was not attractive because he/she was drunk                                     | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

**38. To what extent do you agree with the following statements?**  
(mark one for each line)

- |   | Strongly agree        | Agree                 | Neutral               | Disagree              | Strongly disagree     | Don't know            |
|---|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| a. I feel valued as a person on this campus   | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| b. I feel that faculty and staff care about me as a student                                 | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| c. I have a responsibility to contribute to the well-being of other students                | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| d. My campus encourages me to help others in need   | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| e. I abide by the university policy and regulations that concern alcohol and other drug use | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

**39. In which of the following ways does other students' drinking interfere with your life on or around campus? (mark one for each line)**

- |  | yes                   | no                    |
|--|-----------------------|-----------------------|
| a. Interrupts your studying  | <input type="radio"/> | <input type="radio"/> |
| b. Makes you feel unsafe   | <input type="radio"/> | <input type="radio"/> |
| c. Messes up your physical living space (cleanliness, neatness, organization, etc.)    | <input type="radio"/> | <input type="radio"/> |
| d. Adversely affects your involvement on an athletic team or in other organized groups | <input type="radio"/> | <input type="radio"/> |
| e. Prevents you from enjoying events (concerts, sports, social activities, etc.)       | <input type="radio"/> | <input type="radio"/> |
| f. Interferes in other way(s)  | <input type="radio"/> | <input type="radio"/> |
| g. Doesn't interfere with my life  | <input type="radio"/> | <input type="radio"/> |