USING THE THEORY OF REASONED ACTION
TO PREDICT THE INTENTIONS
OF YOUNG ADULT MALES
TO INITIATE STEROID USE

A Thesis
Presented in Partial Fulfillment of the Requirements for
the Degree Master of Arts in the
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DEDICATION

To my very patient husband
ACKNOWLEDGMENTS

My name may be on this paper, but there are a lot of people who deserve a lot of credit, too. Without my advisor, Dr. Kathleen Lux, this project would have never gotten off the ground—thank you for your insight, support, and guidance! And to my other committee members, thank you for the challenge. I'd like to mention all of the other Health Education students who listened, criticized, explained, and let me use their Personal Health students for my pilot study! I also must thank the Statistical Consultation staff for their patience and availability! Finally, I'd like to thank the Oberteuffer Research Fund for the financial support of this research project.
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FIELD OF STUDY

Major Field:  Health Education
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CHAPTER I

PROBLEM STATEMENT AND INTRODUCTION

Chapter One of this research study will explore the relevance of steroid use among physically active young adult males as a public health problem. Its significance to health education and promotion will be discussed as well. Also included are sections relating to the limitations, delimitations, definitions, and the specific research questions of the present study. The purpose of this study is to test the Theory of Reasoned Action to see if it can be used to predict the intentions of young adult males to initiate steroid use.

PUBLIC HEALTH RELEVANCE

Public Health Significance

In a review of the literature regarding steroid use, Yesalis (1993) concluded that the prevalence of use is spreading to younger populations as well as non-athlete populations. One study claims that in 1975, less than 1% of the high school student body was using steroids (Corder, Dezelsky, Toohey, & DeVito, 1975). However, in
1986 Polen, Schnider, Sirotowitz, and West determined that 18% of high school students were using steroids. Although the exact percentages of use vary in present studies, it is clear that the use of steroids is becoming more and more prevalent. Early studies claimed that steroid users were competitive Olympic-caliber or professional athletes. Now, researchers are finding that many college and high school athletes as well as some non-athletes are using steroids (Buckley, 1988; Chng & Moore, 1990; Pope, Katz, & Champoux, 1990).

Reported reasons for using steroids are no longer just "to be stronger," but now include "I want to look better" and "I want to win" (Chng & Moore, 1990; Evans, Weinberg, & Jackson, 1992; Tricker, O'Neill, & Cook, 1989). Several authors suggest that the culture surrounding today's sporting world provides an intense pressure to win and that athlete's have a win at all costs philosophy (English, 1987; Evans, Weinberg, & Jackson, 1992). In fact, bodybuilders reported feeling that steroids were needed in almost every individual instance to win competitions and that much of the pressure to use steroids comes not only from other bodybuilders, but from their friends outside the sport as well (Tricker, O'Neill & Cook, 1989). The athletes, coaches, spectators, parents, and friends must realize that steroids provide one with more risks than benefits (American College of Sports Medicine, 1987). Other studies have reported that people use steroids simply to look better and more attractive to potential sex partners (Chng & Moore, 1990; Munro, 1991).

Although steroid use is not a problem that affects everyone, the number of people it does reach is growing, perhaps as suggested by Ryan (1981) to epidemic
proportions within the at-risk population of young, physically active people. While there are a number of studies regarding the prevalence of steroid use in various populations, there seems to be a gap in the literature relating steroid use or non-use to characteristics, attitudes, and subjective norms of those people who are members of the at-risk populations.

**Prevalence of Steroid Use**

Despite the illegality and health risks associated with steroid use, many young people, mostly males, choose to use them. Based on a sample of 1,010 college age males, Pope, Katz, and Champoux (1988) found that 2% reported using steroids. Most of the using respondents also participated in some athletic activity. Because of the knowledge that most steroid users are physically active, Chng and Moore (1990) studied 222 college athletes. They found a 22% rate of steroid use among this sample. Munro (1991) surveyed students who attended Arizona State University and worked out in the campus Recreation Complex or in nearby private gyms. Approximately 12% of the respondents in this study reported steroid use. Several studies (Lindstrom, Nilsson, Katzman, Janzon, & Dymling, 1990; Tricker, O'Neill, & Cook, 1989) found that at least one-third of competitive bodybuilders report using steroids. The average age of a "user" was 24 years in these studies. The use of steroids seems to be primarily concentrated in the population of young, physically active males, with an estimated 2% to 22% of them reporting use.
Although the number of dollars spent annually on steroids does not provide a measure of rate of use, it does offer some insight regarding the demand for the drug. Black market sales of steroids averaged $300-500 million annually in 1991, compared with an estimated $100 million in 1986, according to the U.S. Food and Drug Administration.

Factors Associated with Risk

Research indicates that there is not a single factor, or even a combination of factors that guarantees that a person will or will not use steroids. However, some characteristics are more frequently associated with risk than others. Tricker, O'Neill, and Cook (1989) studied amateur bodybuilders and found 55% of the male and 10% of the female respondents used steroids. Other studies have obtained similar results (Chng & Moore, 1990; Pope, Katz, & Champoux, 1988). The median age for steroid use is reportedly between 22–25 years (Chng & Moore, 1990; Lindstrom, Nilsson, Katzman, Janzon, & Dymling, 1990; Pope, Katz, & Champoux, 1988; Tricker, O'Neill, & Cook, 1989). Also associated with use are the desires to improve appearance and performance in sport (Chng & Moore, 1990; Pope, Katz, & Champoux, 1988). Those who do use steroids are also more likely to work out more frequently and for longer durations than the nonusers (Lindstrom, 1990; Tricker, O'Neill, & Cook, 1989). Based upon previous research it can be said that the following characteristics are risk factors associated with steroid use: male, aged 22–25, physically active, desire to "look good", and desire to perform well athletically.
History of Steroid Development and Use

In 1937, Reichman and vanEuw observed that extracts of the adrenal glands had powerful effects on salt and water metabolism as well as the body's handling of carbohydrates and proteins. During World War II, isolated testosterone was given to Nazi soldiers to increase aggressiveness while others were using the compound for its anabolic effects on burn victims (Bergman & Leach, 1985). It was obvious even at this early date in its history, the use of the steroid testosterone had both positive and negative aspects.

Russian athletes were the first to use steroids. By 1959, an American doctor had recognized their use and began to conduct tests using United States athletes (Haupt, 1984). Steroids became increasingly popular, with their use limited to weight lifters and heavy throwers. Slowly the use of steroids spread to football players, swimmers, and track and field participants. The use of steroids was banned by the International Olympic Committee in 1968 and the first official Olympic drug testing took place in 1976. During the 1983 PanAmerican Games, 19 competitors were disqualified when their drug use was detected (Haupt, 1984). Today, the use of steroids is not limited by sport or age. It is not just the professional athletes who are using steroids, but high-school and college students as well (Buckley, 1988; Pope, Katz, & Champoux, 1988).
Chemistry and Physiology of Steroids

Testosterone is an androgenic hormone secreted by the Leydig Cells, which are located in the testes. Normal men produce 2.5 to 10.0 mg of testosterone daily. It is a natural and necessary hormone with anabolic and androgenic effects.

Many athletes with personal experience using steroids claim that they enhance athletic performance, increase muscle size and strength, and improve recovery time between workouts (Evans, 1992). Meanwhile, the medical and scientific communities doubt the positive effects of steroid use on athletic performance. Actually a large majority of the scientific communities regard steroids as dangerous, causing side-effects ranging from acne and increased aggressiveness to liver dysfunction and changes in the reproductive system (American Medical Association, 1980).

It is so far impossible to completely dissociate the anabolic from the androgenic effects of testosterone. Thus, the "anabolic steroids" of today still have some androgenic effects. Anabolic steroids can be taken orally or parenterally. Some oral steroids are Dianabol, Anavar, and Anadrol-50. Deca-Durabolics and Delatestryl are examples of intramuscularly administered steroids (Haupt, 1984).

Approved Medical Uses of Steroids

Anabolic steroids have two widely accepted medical uses. They are used in the treatment of certain types of anemia because of their ability to stimulate erythropoiesis (Haupt, 1984). Steroids are also useful in stimulating sexual development in hypogonadal males (Haupt, 1984). Some glucocorticoids such as
cortisone are used for their anti-inflammatory activity in the treatment of patients with rheumatoid arthritis. Medical communities do, however, continue to doubt that steroids improve an athlete's performance (A.M.A., 1980).

**Adverse Side Effects of Steroid Use**

The abuse of steroids may have a wide range of negative side effects. Among the "minor" effects are hirsutism, severe acne, oily skin, increased blood pressure, changes in libido, and increased aggressiveness (A.M.A., 1980). When used by young individuals, steroids may cause premature closure of the epiphyses, therefore reducing the attainable adult height (A.M.A., 1980). More serious side effects are liver damage, kidney damage, cardiovascular problems, and impairment to the reproductive system (A.M.A., 1980).

**Health Education Relevance**

Steroid use is a relevant topic for health educators, as the personal risk factors associated with use are fairly common, the number of users is growing, and the side-effects of use are potentially lethal. Because steroid use or non-use is a conscious decision made by the individual, it is a behavior that may be modified through the process of health education.

The U.S. government made steroid use illegal in an effort to curb its occurrence. The fact that the number of users is increasing and the money spent on steroids is going up, indicates clearly that this approach has not worked. Just as with
many other drugs, the illegality of steroids has pushed them into the blackmarket where there are no standards regulating their production, distribution, or use, making them even more dangerous (Stehlin, 1987).

The role of Health Education is not just making people more knowledgeable. Theory-based research is needed to help health educators understand the relationships between variables and behavior. The results of this study could help health educators gain insight into other variables (attitudes, behavioral beliefs, outcome evaluations, and subjective norms) that are related to health behavior change. To date no such research studies investigating characteristics related to the initiation of steroid use may be found in the health promotion literature.

All of these factors combine to make steroids and steroid use a topic of significance for health education. By better understanding attitudes and subjective norms regarding steroids, health professionals may be able to design relevant and effective educational programs for the at-risk population (Chng & Moore, 1990).
PURPOSE OF THIS STUDY

The purpose of this study was to test the Theory of Reasoned Action to see if it can predict steroid non-use, as measured by the first three stages in the Processes of Behavior Change, among physically active young adult males.

Research Questions

The following questions have been used to guide this study.

1) What are the attitudes, as measured by the components attitude toward the behavior, behavioral beliefs, and outcome evaluations of young adult males, ages 18–25, in four Central Ohio gyms who are steroid nonusers regarding anabolic steroid use?

2) What are the subjective norms, as measured by the components normative beliefs and motivation to comply, regarding anabolic steroid use among nonusers, according to young adult males, ages 18–25, in four Central Ohio gyms?

3) What are the associations between the attitude and subjective norms components and steroid non-use as measured by the non-using stages (Precontemplation, Contemplation, and Preparation) of the Processes of Change model as reported by young adult males, ages 18–25, in four Central Ohio gyms who currently do not use steroids?

4) To what degree do the attitude and subjective norms components account for variability in reported steroid non-use as measured by the non-using stages (Precontemplation, Contemplation, and Preparation) of the Processes of Change model as reported by young adult males, ages 18–25, in Central Ohio gyms who currently do not use steroids?

Limitations of this Study

This study has several limitations regarding its internal and external validity of which the reader should be aware.
The present study has low external validity. Because a non-random site selection process was used, the sample of respondents may not be representative of the exercising, young adult male population. A convenience sample was used and therefore the results of this study cannot be generalized beyond the sample studied. The respondents voluntarily completed the research questionnaire, therefore those who chose to complete the instrument may be different from those who chose to not complete the questionnaire. The sites selected for this study were all in the Columbus, Ohio area and the results may not be generalized to any other geographical area.

One of the major threats to the internal validity of this study is that the data were self-reported and the topic regarded a controlled substance. There is the chance that respondents lied about their use or attitudes for fear of being identified. In addition, survey respondents know they are being studied and this awareness may change their responses. Despite these threats to validity, self-administered forms produce less social desirability bias than do alternative forms, such as personal or telephone interviews (Aquilino & Losciuto, 1990).

Another threat to validity is that the instrument used in this study measures intentions rather than actual behaviors. Two studies (Burnkart & Page, 1982; Chassin, 1981) conducted health-related research based on Ajzen and Fishbein's Theory of Reasoned Action. These researchers found attitudinal and normative constructs to be antecedents of behavioral intentions.

The research tool used in this study was developed by the researcher. The scales measuring attitude toward steroid use, beliefs about the behavior, outcome

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evaluations, normative beliefs, motivation to comply, intentions, and demographics were reviewed by a panel of experts to achieve content and face validity and then pilot and field tested.

**Delimitations**

There are some boundaries within which this study has been conducted. First, only young adult males were chosen to participate in this study. This population was chosen because they are most frequently involved in the use of steroids. Secondly, the subjects are from one geographic region (central Ohio). Thirdly, all participants are males who attend the gymnasiums chosen for this study. Based upon these boundaries, the study results may not be generalized to a population other than physically active young adult males in central Ohio. Fourth, actual behaviors were not measured. Intentions to use or not use steroids served as the measures of behavior. Fifth, behaviors were self-reported and the possibility of unreliability that is inherent in self-reports was accepted. No checks of validity of the self-reported behaviors were conducted. Many of these delimitations have been set due to time, money, or access restraints.
Definitions

Steroid—synthetic derivative of the male hormone testosterone designed to enhance anabolic and minimize androgenic effects (Haupt & Rovere, 1984).

young adult—person between the ages of 18–25.

*operational* males who are between the ages of 18 and 25 and attend one of the four participating gyms in Columbus.

physically active—subject who attends and works out at one of the selected sites at least twice a week.

attitude—complex system comprising the person's beliefs about the object or action in question. Contains an evaluative component. Attitude is determined by assessing attitude toward a behavior, behavioral beliefs, and evaluation of outcomes (Ajzen & Fishbein, 1980).

*operational* rating accomplished through self-reported intensities of disagreement or agreement with thirty-two statements regarding steroid use. Mean attitude toward the behavior (#1–10), behavioral belief (#11–21), and outcome evaluation (#22–32) scores were used in the correlation and regression in this study.

attitude toward a behavior—person's interpretation of the characteristics, attributes, and qualities of an object or behavior (Ajzen & Fishbein, 1980). *operational* the degree to which steroid use is viewed as a generally positive or negative behavior. Questions 1–10 on the Anabolic Steroids Questionnaire assess beliefs regarding steroids. They are measured on a 6-point semantic differential.

behavioral beliefs—subjective probability that performing a behavior will result in a given outcome (Ajzen & Fishbein, 1980). *operational* the strength of the respondent's belief that various outcomes will occur if he uses steroids. This is measured on a 6-point semantic differential, using questions 11–21 on the Anabolic Steroids Questionnaire.

outcome evaluation—how confident a person is that a behavior does indeed lead to various consequences (Ajzen & Fishbein, 1980). *operational* the strength of the respondent's evaluation of the likelihood of various outcomes associated with the use of steroids. This is measured by questions 22–32 on the Anabolic Steroids Questionnaire using a 6-point semantic differential scale.

subjective norm—a person's perception that most people who are important to him think he should or should not perform a certain behavior (Ajzen & Fishbein, 1980). *operational* self-reported perceptions of whether people think steroid use is good or bad. The subjective norm is determined by multiplying each "Normative belief" score by its corresponding "Motivation to Comply" score.
normative belief— an individual's belief about another person's behavioral prescription for that individual (Ajzen & Fishbein, 1980).

**operational** respondent's interpretation of how certain individuals view the respondent's use of steroids. Seven statements (#39–#45 on the Anabolic Steroids Questionnaire) assess the normative beliefs using a 6-point Likert-type scale.

motivation to comply— degree to which an individual wants to do what others thinks he should do (Ajzen & Fishbein, 1980).

**operational** respondent's report of how much he tries to please various other people. Statements 46–52 on the Anabolic Steroids Questionnaire measure motivation to comply, using a 6-point Likert-type scaling method.

intention— whether a person plans to perform or not perform a behavior in question. Considered the immediate determinant of the behavior (Ajzen & Fishbein, 1980).

**operational** rating accomplished through self-reported plans to initiate steroid use. The intentions scale consists of sixteen statements on the Anabolic Steroids Questionnaire to which the respondent disagrees strongly (1) or strongly agrees (6). This scale was developed based upon Prochaska's (1992) five stages of behavior change. Respondents who were in the "Maintenance" or "Cessation" stages were considered users and were not included in this study.

Stages of Behavior Change— transtheoretical model in which people cyclicly move when modifying a behavior (DiClemente & Prochaska, 1991).

**operational** the first three stages of this model will be used. They are the non–using stages of Precontemplation, Contemplation, and Preparation. These will serve as the dependent variables.

precontemplation— person has never considered using steroids. This stage is measured by questions 53–56.

contemplation— person has though about using steroids. Questions 57–60 measure this stage.

preparation— person has taken steps to initiate steroid use, but has not performed the actual behavior of using steroids. This stage is measured with questions 61–63.

maintenance— person is using steroids on a regular basis. Questions 64–66 measure this stage.

cessation— person used to use steroids, but does not perform this behavior any longer. Questions 67–68 measure this.
Importance of this Study

The non-medical use of anabolic steroids seems to be spreading with no regard to age or activity (Buckley, Yesalis, & Friedl, 1988). Although the National Collegiate Athletic Association and International Olympic Committees have long since considered the use of steroids illegal, many athletes still attempt to fool the system—and many get caught and disqualified from future competitions. The Physician's Desk Reference (1984) states: "Warning: Anabolic steroids do not enhance athletic ability". The American College of Sports Medicine position statement (1987) claims that the administration of steroids does not in and of itself bring about any significant improvements in strength, endurance, lean body mass, or body weight, may result in liver disorders, and reduce testicular size and function. Serious and continuing efforts should be made to educate athletes, coaches, trainers, and physicians regarding the inconsistent effects and dangers of steroid use. Despite all of these warnings, many people still choose to risk everything and use steroids.

Although there are a few researchers who have conducted prevalence of use studies, many health education and sports researchers apparently are choosing to ignore the problem of steroid abuse. Educational programs in many other health related areas are now based on an understanding of a behavior (i.e., condom use, alcohol and drug abuse, smoking) but there have been no theory based studies regarding steroid use to provide insight into steroid use behavior. Health educators need theory–based studies on steroid use to effectively reach and teach the at-risk populations about steroids.
This study is an attempt to begin to explain the attitudes, behavioral beliefs, outcome expectations, and subjective norms surrounding the intentions of young adult males who do not use steroids. Study results can be used to help the health educator identify and effectively reach the at-risk young adult male population.

SUMMARY OF CHAPTER ONE

Although steroid use has occurred for quite some time in elite athletes, namely power lifters, heavy throwers, and football players, their use is spreading to younger and less professional athletes, as well as some non-athletes. Because steroid use has many dangerous, even deadly, side effects, the seemingly boundless spread of steroid use is becoming a health concern for broader and broader populations. While some studies report an estimated prevalence of use in various populations, none have attempted to use theory to explain, correlate, or predict steroid use in any population. If health education research in this area is conducted, health professionals will have a better understanding of why some people choose to use steroids while others do not. Therefore, health educators will be able to design and implement more effective education programs deterring young people from initiating steroid use.
CHAPTER II

REVIEW OF THE LITERATURE

Restatement of Purpose

The purpose of this study was to test the Theory of Reasoned Action to see if it can predict steroid non-use, as measured by the first three stages in the Processes of Behavior Change, among physically active young adult males.

The Review Process

A CD-ROM search was conducted using PsychLit (1/87–6/93) and SportDiscus (1975–June 1993). The descriptors used were steroid, drug, male, athlete, college, social support, social norms, theory, and reasoned action. It appears that much research regarding the physiology, chemistry, and biopsychology of steroid use has been completed. Experts in all fields agree that while having a few approved medical uses, steroids have much greater deleterious effects (Haupt, 1984). All articles found discussing the prevalence of steroid use, attitude toward use, application of theory to explain drug use, or applications of the Theory of Reasoned Action to behaviors of a young adult population were marked in the search and reviewed for relevance.
DESCRIPTIVE STUDIES OF STEROID USE

There were several research articles that attempted to estimate the prevalence of steroid use. They examined high school age, college age, and athlete populations.

Buckley, Yesalis, and Friedl (1988) reported finding a 6.64% prevalence of steroid use among twelfth-grade males. This study was designed to elicit descriptive data that may be used to establish guidelines for subsequent studies. The sample of males was drawn from 150 high schools across the United States. A questionnaire was sent to 6,765 senior male students and 3,403 of these students voluntarily participated, for a response rate of 50.3%. The instrument consisted of 23 questions regarding steroid usage and basic health behavior. Pilot studies established that the instrument could be used with this population without difficulty. No information regarding the validity or reliability of the instrument was available. The Chi-square statistic was used to test for significant differences between steroid users and non-users.

Only 9.5% of the self-reported steroid users had used the drugs for only one cycle. Approximately 44% of the users said they had used more than one anabolic steroid at the same time (stacking). Sixty percent of the users reported their source of anabolic steroids as "black market." The main reasons for reported use were "improving athletic performance" (41.7%) and "appearance" (26.7%).

A 1988 study conducted by Pope, Katz, and Champoux found 2% of male college students are using steroids. Pope, Katz, and Champoux mailed a one-page questionnaire to all male seniors, ages 21–23, attending three universities in the
eastern United States. Of the 3,275 males who received the questionnaire, 1,010 returned the completed questionnaire, for a response rate of 31%. Seventeen of the 1,010 respondents (2%) reported using steroids. Eleven of the 17 users were varsity athletes participating in football, lacrosse, shot put, or power lifting. Four of the 17 steroid users reported participating in recreational athletic activities only. Improving performance in sport and improving personal appearance were cited by users most often as the main reasons for choosing to use steroids.

Although half of the respondents commented on their increased irritability or aggressiveness when using steroids, most respondents expressed considerable satisfaction with their experience using steroids. There was no information given regarding the validity or reliability of the instrument used in this study. The low response rate obtained in this study was its main methodological limitation, therefore the prevalence of steroid use may be substantially underestimated or overestimated.

The researchers do report receiving lengthy notes on the instrument, cautioning that steroid users would not respond or would lie about the extent of their use, which also has direct implications regarding the validity of the study.

Chng and Moore (1990) mailed a five-page questionnaire to 222 volunteer subjects in Texas. The instrument was designed to measure knowledge, attitude, and prevalence of steroid use among college athletes. Items were reviewed by health professionals and student-athletes for appropriateness, relevance, and clarity. A pilot test was also conducted and revisions were made. The instrument was divided into three scales. The internal consistency coefficient alpha for scale I (attitude) was
estimated to be 0.88. An exploratory factor analysis was conducted. Fourteen questionnaire items were used to measure the attitude scale. After the factor analysis, 11 items were retained and 3 were dropped. Factor loading values for the retained items were all greater than 0.5 and the Eigenvalue was 4.58. The estimated KR–20 internal consistency reliability for scale II (knowledge) was 0.70. The eight items in scale III sought information regarding demographics, patterns, and motivation for steroid use.

Twenty–three percent of the sample reported use of anabolic steroids. Users had higher knowledge regarding use (dosage, side–effects, and long–term health consequences) than did the non–users (t=9.5, p,<.001). The mean attitude score of the users (31.7) was significantly more positive than the score of non–users (18.4) (t=11.9, p<.001). The mean age of respondents was 22. The major reasons cited for using steroids were "I want to be stronger" and "I want to look more muscular/attractive."

Despite the quality of the instrument used, participation was voluntary and data were self–reported which place limitations on the findings of this study.

In 1990, Lindstrom and Nilsson conducted a study to determine the frequency of and attitude toward anabolic–androgenic steroid use among body–builders. The sample consisted of the 138 male body–builders belonging to a private gymnasium in a Swedish city. The 49–item questionnaire was designed to gather information regarding use of steroids, knowledge and attitude concerning usage of steroids, and
social background of the participants. No measures of internal consistency or reliability were given.

Of the 138 subjects, 53 reported using steroids (38%). Users reported training more frequently and for longer periods than the non-users. Seventy-five percent of the body-builders taking part in competition reported using steroids. Users were found to be much better informed than non-users when tested on their knowledge about anabolic-androgenic steroids. Although 94% of the reported users considered steroids dangerous, 74% planned to continue using them. Eighty-one percent of the steroid users reported side-effects, which did not influence their intention to continue use in the future. The main motive for use was to increase muscle volume and most users cited experiencing this benefit of steroid use.

The high rate of response in this study may be explained by the fact that one of the researchers attended body building at the gym. However, the validity of this study has not been evaluated.

The purpose of the 1989 study by Tricker, O’Neill, and Cook was to determine the incidence of anabolic steroid use among competitive body builders. A questionnaire was sent to 380 competitive body builders in Kansas and Missouri and 176 of the body builders returned a completed questionnaire (46%). The instrument developed and used in this study was the Midwestern States Amateur Bodybuilding Questionnaire (MSABQ). Experts in the field reviewed the MSABQ and reliability was determined from a pilot study. Test/retest reliability was found to be 0.97.
The male respondents numbered 108 and 55% reported using steroids. The other 68 respondents were female and 10% were users. Both male and female users trained more often and for longer duration than their non-using counterparts. Users reported feeling that the use of steroids was necessary to win competitions. They support the belief that there is a positive relationship between use and lean muscle mass and strength. The steroid users also were more aware of health risks associated with use. While they reported this knowledge, they also reported that it did not deter them from using steroids.

Although the authors guaranteed anonymity, there may still be an information gap between actual and reported levels of steroid use among body builders because steroid use is not allowed in body building competitions. Respondents may have been afraid the anonymity and confidentiality of their responses could be compromised.

In 1991, Munro surveyed college students working out in private gyms and the Arizona State University Student Recreation Complex. A total of 454 male and female college age subjects participated on a voluntary basis. The instrument consisted of 43 True/False knowledge and attitude questions as well as several items gathering demographic information. The questionnaire required 15–20 minutes to complete. To assure the items in the instrument were consistent with similar research conducted on steroids, questionnaires used by other researchers were reviewed prior to the writing of the questionnaire. A pilot study was conducted to identify problems with the instrument. However, there were no measures of validity or reliability reported.
Approximately 12% of the respondents reported having used steroids. The highest mean knowledge score was obtained by anabolic steroid users who work out in private gyms. However, there was no significant difference in the scores obtained by the non-users or users (despite workout location) when the mean scores were tested through Analysis of Variance. The highest attitude mean was obtained by those who work-out in private gyms, indicating a positive attitude toward steroid use. There was no correlation found between knowledge and attitude or between knowledge and behavior.

Results indicated the correlation between attitude and behavior (0.599) was statistically significant, using the Pearson r. Attitude explained 36% of the variance in behavior which made it somewhat predictive of anabolic steroid behavior. Those who reported knowing at least one individual who used steroids were more likely to use steroids themselves. Again, all data were self-reported and there is a chance that respondents were giving socially desirable responses.
Summary: The following list summarizes the findings that are pertinent to the present research study.

- 6.64% of high school senior males have used steroids. Main reasons cited are for improving athletic performance and appearance (Buckley, 1988).

- 2% of college males use steroids. Major reasons are for improving performance and appearance. Most users participate in some athletic activity (Pope, 1988).

- 23% of college athletes have used steroids. The knowledge was higher and the attitude toward steroids more positive for users than non-users (Chng, 1990).

- 38% of body builders in a Swedish study report using steroids. Most users considered them dangerous and experienced side-effects, but this did not influence their intention to continue using the steroids (Lindstrom, 1990).

- 55% of male body builders reported using steroids. They were aware of the health risks, but felt use was necessary to win competitions (Tricker, 1989).

- 12% of students who work out in gyms at Arizona State University report using steroids. The highest attitude toward steroids was obtained by those who work out in private gyms, indicating a more positive attitude toward steroid use (Munro, 1991).
• The achieved response rate in these studies is consistently low. Due to the assured anonymity of the research, it is impossible to follow-up the non-respondents (Pope, 1988; Tricker, 1989).

• Most of the studies reported finding small numbers of reported steroid users, yet the researchers attempt to compare the users with the non-users (Pope, 1988; Munro, 1991; Tricker, 1989).

• Only two of the studies reviewed for this research reported measures of instrument reliability and validity. Only one of the studies reported any factor analysis or other appropriate statistic (Chng & Moore, 1990; Tricker, O'Neill, & Cook, 1989).

• Only one of these descriptive studies investigated correlates of behavior or predictors of behavior (Munro, 1991).
THEORY BASE FOR STUDY

While there are studies regarding the application of the Theory of Reasoned Action (TRA) to other behaviors (alcohol use, illicit drug use, and condom use) there were none dealing directly with steroid use. Reviewed here are the above-mentioned articles as well as several attitudinal studies. An overview of the Theory of Reasoned Action is also provided.

Attitudinal Studies

The purpose of the 1992 study by Evans, Weinberg, and Jackson was to explore the psychological factors associated with drug use in a group of college athletes. Of the 625 questionnaires mailed to athletes at eight Division I Universities, 544 were returned and usable. The subjects completed the Profile of Mood States (POMS) questionnaire, the Coopersmith Self-Esteem Test, and a questionnaire dealing with frequency, intensity, and duration of drug use. The categories of drugs included alcohol, amphetamines, anabolic steroids, barbiturates, cocaine, hallucinogens, and marijuana. The most widely used drug was alcohol (87.8%) and steroids were used by 7.6% of the respondents. Based upon the high prevalence of alcohol and marijuana, steroids as well as the other four drugs were not included in further statistical analysis. Alcohol users scored higher on POMS subscales of anger, fatigue, and vigor than non-users of alcohol. Alcohol users also reported feeling more pressure from coaches to perform well. Some athletes also reported using alcohol in response to social pressures.
English (1987) used several suggestions from the framework of Richard Jessor's concept of transitional proneness to address the issue of steroid use. This explanation of why athletes choose to use steroids is theoretical and includes no survey or descriptive data. There are four major concepts upon which this explanation is based. Athletes who experience blocked goals believe they possess inadequate natural ability, therefore they use steroids to enhance athletic ability. Expressing solidarity or gaining access to a peer group is sometimes accomplished by doing what the peers (or team members) are doing, although it is potentially dangerous. Athletes who fear failure may use steroids to enhance their performance, thereby reducing anxiety.

Athletes may often use steroids to overcome psychologically contrived inadequacies. When this occurs, steroids become a form of injectionable "self-esteem". English feels the "peer pressure is often intense and the arguments used to persuade the athlete to initiate drug use are compelling", so individuals should be provided with accurate information regarding costs and benefits of anabolic steroid use as well as trained in argument refutation and increasing their sense of reality and self-concept. There is no evidence provided that the concepts in this model are valid and appropriate. There are no recommendations for further research.
An Overview of the Theory of Reasoned Action

Fishbein and Ajzen's theory of reasoned action (TRA) is based on the assumption that human beings are usually quite rational and make systematic use of the information available to them. The ultimate goal of this theory is to predict and understand an individual's behavior. For a diagram of the Theory of Reasoned Action, see Figure 1.

Behavioral intentions may be defined as a measure of the likelihood that a person will engage in a certain behavior. According to the TRA, intentions to perform a behavior immediately precede the overt behavior. Therefore it is necessary to identify the determinants of intentions. A person's behavioral intention is a function of two basic determinants, the person's attitude and the subjective norms regarding the behavior (Ajzen & Fishbein, 1980).

Attitude is determined by three components: attitude toward the behavior, behavioral beliefs, and outcome evaluation. The attitude toward the behavior refers to a person's judgement that performing the behavior is generally good or bad. Attitudes toward any object or action are also determined by beliefs about that object or action. Beliefs are formed by associating it with various characteristics, qualities, and attributes. A person's life experiences lead to the formation of beliefs. To measure the strength of a person's belief, he can be asked to indicate the likelihood that performing a behavior will result in a given outcome. The outcome evaluation is the favorability or unfavorability of the total set of consequences that may be associated
Figure 1. The Theory of Reasoned Action adapted from Ajzen and Fishbein, 1980
with the object or action. The more positive the attitude, the more he will intend to perform the behavior (Ajzen & Fishbein, 1980).

The subjective norm refers to a person's perception that important others desire the performance or non-performance of a specific behavior. This perception may or may not reflect what the important others actually think he should do. According to the TRA, the more a person perceives that others think he should perform a behavior, the more he will intend to do so. A person's general motivation to comply with each referent also affects the subjective norm. By taking into account the motivation to comply, it is ensured that important referents are given proportionately more weight in determining the subjective norm (Ajzen & Fishbein, 1980).

In most instances it is likely that people hold favorable attitudes toward behaviors their important others think they should perform and negative attitudes toward behaviors their important others think they should not perform. Generally speaking, individuals will intend to perform a behavior when they hold positive attitudes toward it and when they believe that important others think they should perform it (Ajzen & Fishbein, 1980).
Studies Based on Theory of Reasoned Action

Ross and McLaws (1992) studied the applicability of the Theory of Reasoned Action to condom use. The researchers surveyed a convenience sample of 178 homosexually active men. The refusal rate was less than 10%. Attitude toward condoms and behavioral intentions were measured by a five-point Likert scale. Normative and behavioral beliefs were also measured. No information regarding the reliability or validity of the instrument was offered.

Pearson product-moment correlation coefficients were calculated for bivariate regression analyses. T-tests were computed between the strong and less strong intention groups on behavioral and normative belief items. Subjective norms accounted for most of the variance (B=0.43) associated with intention to use condoms. Strong evidence was found that sexual partners and peers play a much greater part in intentions to use condoms than do the family or people in the community.

Because this study was based on data gathered from a convenience sample, the researchers suggest that its generalizability to other groups cannot be assumed in the absence of confirmatory data. Although it is useful to know that the TRA can be used to explain various behaviors, one must be cautious when trying to apply findings based on one behavior to a different behavior.

London (1982) examined the attitudinal and social normative factors relating to intended alcohol abuse among pre-adolescents. The 650 subjects attended five schools in urban New Jersey. They were in fifth or seventh grade. Male subjects numbered 321 and there were 329 female subjects. Classroom teachers administered
the questionnaire to all students present in the classroom on the designated day. The instrument used a four-point scaling procedure to measure behavioral intentions, attitude toward the behavior, beliefs about consequences of the behavior, and evaluations of the consequences of the behavior. A five-point procedure was used to measure subjective norms, normative beliefs, and motivations to comply. A pilot study was conducted and the percentage of agreement between administration 1 and administration II was 89% for the fifth graders and 76% for the seventh grade.

When behavioral intention was predicted from the attitude toward the behavior and subjective norms, a multiple correlation coefficient of .36 was produced. This accounted for 14% of the variance in explaining the intention of the subject to abuse alcohol. Beliefs of the "intenders" and "non-intenders" were compared using t-tests. The t-tests indicated that there are significant differences regarding beliefs about alcohol abuse and their corresponding evaluations of the consequences of alcohol abuse. The researcher claimed that although the multiple correlation coefficients were of low magnitude, the fact that they were statistically significant supported the ability of the Fishbein model to predict behavioral intentions. When interpreting these results, however, one must keep in mind the effects of the large sample size on achievement of statistical significance. Although the anonymity of the subjects was guaranteed, it is possible that the self-reported data are not entirely reflective of the attitudes, beliefs, and norms of pre-adolescents due to the illegality of alcohol use for this age group.
The purpose of the 1983 study by McCarty, Morrison, and Mills was to compare attitude–behavior relationships as they relate to alcohol use. A random sample of 658 undergraduate students attending University of Massachusetts were mailed the Student Alcohol Survey. A total of 465 usable responses was obtained for a return rate of 70%. The ten-page instrument was designed to gather information in six content areas: 1) alcohol behavior, 2) attitude and beliefs about drinking, 3) perceived social influences on alcohol use, 4) knowledge about alcohol, 5) awareness of campus programs for prevention of alcohol misuse, and 6) demographic characteristics. There were no reported measures of validity or reliability, but the instrument was pre–tested and consequently revised.

The researchers found that self–reported alcohol consumption correlated with the attitude toward alcohol measures \((r=.50, t=4.26, p<.001)\) much more strongly than it did with beliefs about alcoholism \((r=.32)\). Using F–ratios to compare belief and belief evaluation scores of heavy and non–drinkers, substantial differences were found on almost every item. The heavy drinkers felt drinking six or more drinks was less likely to cause them to "act foolishly" or "injure myself" and more likely to result in an enjoyable experience than did the non–drinkers.

The researchers state that interventions that increase the perceived risk of personal injury, acting foolish, and losing control from heavy drinking may modify beliefs. Subsequent studies must test such applications.

Budd, Bleiker, and Spencer (1983) studied the application of reasoned action to predict and explain the marijuana use of young adults. The sample consisted of 99
students attending a British University. A range of disciplines were represented and the average age was 20.6 years. The questionnaire consisted of 47 items regarding personal drug experience, knowledge about marijuana, beliefs about use, and relating these beliefs to oneself. Most items were measured on a seven-point response scale and answers were self-reported. No measures of consistency or validity were given.

Respondents were divided into four categories labelled "never-user", "experimental user", "occasional user", or "regular user" based on a self-rating item. Mean scores and F-ratios were calculated for evaluations of the beliefs and normative beliefs. To explore which combination of evaluative belief and social norms best predicted a "regular user" or a "non-user", a step-wise discriminant analysis was carried out on the data. It was found that an absence of social disapproval together with an emphasis on the pleasurable qualities of marijuana are the belief and normative conditions that most characterize the regular users. Non-users behavior results from their perception of the potential harm of using the drug and their belief that others would expect them not to use it. The authors claim through the use of the methodology of Fishbein and Ajzen, drug use and non-use can be conceived of as reasoned actions. However, one must keep in mind the relatively small sample size and self-reported data.
Summary

The following list summarizes the findings that are pertinent to the present research study:

- There has been no previous published research using the Theory of Reasoned Action to predict steroid use in physically active young adult males.
- All of the studies found attitudes and subjective norms to be useful in predicting intentions.
- Subjective norms accounted for more of the variance in intentions to use condoms than did attitudes (Ross & McLaws, 1992).
- Attitudes and subjective norms worked together to account for 14% of the variance in intentions of pre-adolescents to drink alcohol (London, 1982).
- Attitude toward alcohol was found to be more strongly correlated with alcohol use than subjective norms, when studying college students (McCarty, Morrison, & Mills, 1983).
- Attitudes and beliefs worked together to predict the intentions of college students to use or not use marijuana. Significant differences exist between the attitude and norms scores of users versus non-users (Budd, Bleiker, & Spencer, 1983).
CHAPTER TWO SUMMARY

Through a review of the literature related to steroid use, it has been found that young, physically active males make up the population most likely to use steroids. Steroids are reportedly most commonly used to improve appearance or to improve performance in sports.

The TRA has had many applications, and Ajzen and Fishbein (1980) have reported in a number of health-related areas that this model provides high correlations between attitudes and subjective norms and behavioral intentions. As previously stated, there has been no published research applying the TRA to steroid use. Because the more one knows about the factors underlying a decision to perform or not perform a given behavior, the greater the probability that one can influence that decision, the goal of the present study was to determine the relationships between attitudes, subjective norms, and intentions involving steroid non-use in physically active young adult males.
CHAPTER III

METHODS

Restatement of Purpose

The purpose of this study was to test the Theory of Reasoned Action to see if it can predict steroid non-use, as measured by the first three stages in the Processes of Behavior Change, among physically active young adult males.

Research questions

1) What are the attitudes, as measured by the components attitude toward the behavior, behavioral beliefs, and outcome evaluations of young adult males, ages 18–25, who are steroid non-users, in four Central Ohio gyms regarding anabolic steroid use?

2) What are the subjective norms, as measured by the components normative beliefs and motivation to comply, regarding anabolic steroid use among non-users, according to young adult males, ages 18–25, in four Central Ohio gyms?

3) What are the associations between the attitude and subjective norms components and steroid non-use as measured by the non-using stages (Precontemplation, Contemplation, and Preparation) of the Processes of Change model as reported by young adult males, ages 18–25, in four Central Ohio gyms who currently do not use steroids?

4) To what degree do the attitude and subjective norms components account for variability in reported steroid non-use as measured by the non-using stages (Precontemplation, Contemplation, and Preparation) of the Processes of Change model as reported by young adult males, ages 18–25, in Central Ohio gyms who currently do not use steroids?
HUMAN SUBJECTS APPROVAL

The Ohio State University Human Subjects Review Committee approved this study on February 17, 1994. The protocol number is 94B0051. The Human Subjects Review approval form may be found in Appendix A.

RESEARCH DESIGN

The design of this research was an ex-post facto, or causal-comparative, static group comparison conducted with the purpose of investigating the relationships between variables (Rubinson & Neutons, 1987). This study was designed to show how four characteristics (attitude toward a behavior, behavioral beliefs, outcome evaluations, and subjective norms) vary together and to see how well the first three stages of behavior change regarding intentions to initiate steroid use can be predicted from knowledge of these four characteristics.

This study utilized descriptive self-reported data to assess the attitudes, subjective norms, and intentions to use steroids of physically active young adult males.

LIMITATIONS OF THIS STUDY

This study has several limitations of which the reader should be aware. The present study has low external validity. Because a non-random site selection process was used, the sample of respondents may not be representative of the exercising, young adult male population. A convenience sample was used and therefore the results of this study cannot be generalized beyond the sample studied. The
respondents voluntarily completed the research questionnaire, therefore those who chose to complete the instrument may be different from those who chose to not complete the questionnaire. The sites selected for this study were all in the Columbus, Ohio area and the results may not be generalized to any other geographical area.

One of the major threats to the internal validity of this study is that the data were self-reported and the topic regarded a controlled substance. There is the chance that respondents lied about their use or attitudes for fear of being identified. In addition, survey respondents know they are being studied and this awareness may change their responses. Despite these threats to validity, self-administered forms produce less social desirability bias than do alternative forms, such as personal or telephone interviews (Aquilino & Loscuito, 1990).

Another threat to validity is that the instrument used in this study measures intentions rather than actual behaviors. Two studies (Burnkart & Page, 1982; Chassin, 1981) conducted health-related research based on Ajzen and Fishbein's Theory of Reasoned Action. These researchers found attitudinal and normative constructs to be antecedents of behavioral intentions.

The research tool used in this study was developed by the researcher. The scales measuring attitude toward steroid use, beliefs about the behavior, outcome evaluations, normative beliefs, motivation to comply, intentions, and demographics were reviewed by a panel of experts to achieve content and face validity and then pilot and field tested.
DELIMITATIONS

There are some boundaries within which this study has been conducted. First, only young adult males were chosen to participate in this study. This population was chosen because they are most frequently involved in the use of steroids. Secondly, the subjects are from one geographic region (central Ohio). Thirdly, all participants are males who attend the gymnasiums chosen for this study. Based upon these boundaries, the study results may not be generalized to a population other than physically active young adult males in central Ohio. Fourth, actual behaviors were not measured. Intentions to use or not use steroids served as the measures of behavior. Fifth, behaviors were self-reported and the possibility of unreliability that is inherent in self-reports was accepted. No checks of validity of the self-reported behaviors were conducted. Many of these delimitations have been set due to time, money, or access restraints.

MEASURES

Independent Variables

The independent variables in this study were based on the constructs in the Theory of Reasoned Action. The four variables were Attitude toward the behavior, Behavioral Beliefs, Outcome Evaluations, and Subjective Norms.

Dependent Variables

This study had three dependent variables. They were based on the non-using stages of Prochaska and DiClemente's Processes of Behavior Change Theory. The
variables were the Precontemplation stage, the Contemplation stage, and the Preparation stage.

POPULATION AND SAMPLE

The target population for this study was physically active young adult males, ages 18–25, living in Columbus, Ohio. The accessible population consisted of members of four Central Ohio private gyms, whose owners agreed to give the members the opportunity to fill out the survey instrument. There were five gym owners in the Columbus area who did not agree to participate with the research project. The accepting sample for this study consists of male gym members who voluntarily filled out the questionnaire while they were at the gym. The data sample consisted of the gym members who correctly completed the instrument.

This population was chosen because the literature has suggested that those who are at risk for becoming steroid users are young, physically active, adult males (Munro, 1991; Pope, Katz, & Champoux, 1989). Although steroid use is more prevalent within the population of athletes, access to that group was virtually impossible. Because it is against NCAA guidelines, Olympic committee rules, and the rules of most professional sports associations, athletes, owners, and coaches have much to lose if steroid use is discovered. Thus, members of this population are reluctant to talk about steroids and some claim that no one on a college or professional sports team will tell the truth anyway (Pope, Katz, & Champoux, 1989). It was decided that the young men who attend gyms are physically active, yet they do not have nearly so
much to lose by openly discussing steroid use or attitudes toward steroid use as do members of sports teams.

SAMPLE SIZE

The appropriate sample size to use in a study is based upon several factors. One of these is the desired level of significance. The chosen alpha level in the present study is 0.05, resulting in a 0.95 confidence level. The estimated effect size ($R^2$) is equal to 0.10. This number is based on previous research, having practical and theoretical significance. The number of independent variables being measured is considered in the calculation as well. This study has four: the attitude toward a behavior, behavioral beliefs, outcome evaluations, and subjective norms. Lastly, the desired level of power is used. Desired power for the present study was 0.90 (Cohen & Cohen, 1975).

Following calculation, the necessary sample size in this study was 153. To see the computations necessary to determine the sample size for this study, see Appendix B.

DESCRIPTION OF THE INSTRUMENT

The 68-item written questionnaire used in this study was based on the format recommended by Ajzen and Fishbein (1980) for studies based on the Theory of Reasoned Action. Steroid non-users and users were identified using a variation of the Prochaska and DiClemente (1985) Process of Change scale. The specific items on the
The questionnaire were included based upon information found in the review of the related literature as well as through discussions with Health Education professionals. The survey instrument may be found in Appendix C.

The questionnaire had seven sections arranged in the following order: 1) Attitudes toward steroid use; 2) Behavioral beliefs; 3) Outcome evaluations; 4) Demographic data; 5) Normative beliefs; 6) Motivation to comply; and 7) Intentions to use steroids. Each section will be briefly described.

**Attitude**

Attitude toward a behavior was measured using ten statements. Respondents answered on a Likert-type scale with options ranging from Extremely Bad (1) to Extremely Good (6). This scale does not include the "no opinion" option.

**Behavioral beliefs**

Eleven statements measured behavioral beliefs regarding steroid use. This was measured on a 6-point Likert-type scale with Extremely Unlikely (1) to Extremely Likely (6) as the bipolar adjectives. There was no "no opinion" option.

**Outcome evaluation**

The eleven items in this scale corresponded to the eleven items measuring Behavioral beliefs. This scale was measured on a 6-point Likert-type scale with answers ranging from Extremely Bad (1) to Extremely Good (6).
Normative beliefs

This scale consisted of seven questions regarding the respondents perception of how he thinks other people around him view steroid use. This includes the perceived opinions of his friends, other gym members, family, the medical profession, and other people who are important to him. This scale was scored on a 6-point Likert-type scale with options ranging from Extremely Unlikely (1) to Extremely Likely (6).

Motivation to comply

The seven statements on this scale corresponded to the seven items measuring Normative beliefs. Respondents answered on a 6-point Likert-type scale with options ranging from Never (1) to Always (6).

Intentions

Intentions to initiate steroid use were measured with sixteen items pertaining to the respondent's intent to use steroids. Possible answers ranged from "Strongly Disagree" (1) to "Strongly Agree" (6) and were scored on a six-point Likert-type scale.

Demographics

There were five items gathering demographic information regarding the respondent's age, income, race, and measures of physical activity.
Scaling of the Instrument

One type of scale was employed in this survey questionnaire: Likert-type. This type of scale gathers data on the interval level.

The attitude, behavioral beliefs, outcome evaluations, normative beliefs, and motivation to comply sections were measured using a Likert scale with options ranging from 1 to 6. Subjects were to respond to each item with degrees of intensity of their feelings or beliefs regarding each statement. A higher score reflected, in this study, a more positive attitude toward steroid use, stronger beliefs that a certain outcome associated with steroid use would occur, and feelings that certain outcomes were good (Kerlinger, 1964; Rubinson & Neutons, 1987).

The semantic differential format was used to measure the components. This type of format was flexible and easy for the respondent to complete. A pair of bipolar adjectives were used to measure each scale (i.e., unlikely–likely or bad–good). There were six spaces between the poles. An "x" in the first space was assigned a value of 1, as an "x" in the sixth space was assigned a value of 6. Using this scoring scheme, there was no disadvantage of working with negative quantities (Kerlinger, 1964).

The survey instrument required about twenty minutes to complete. A copy of the instrument may be found in Appendix C.

Instrument Development

A panel of experts reviewed the survey instrument for content and face validity. This panel consisted of three people from the field of Health Education,
three experts on instrumentation, and three steroid/physical training experts. Changes that were recommended by two of three experts in a field or by a total of five of the experts were done. Appropriate changes were made in the instrument. For a copy of the panel of experts review form, see Appendix D.

The panel of experts was specifically asked to comment on the content validity of the instrument. It was determined that the items on the questionnaire were content valid.

The questionnaire was then administered to 33 males who were enrolled in and attended one of the undergraduate personal health courses (HE 103- Health in American Society) at The Ohio State University. This decision was made by the researcher in order to retain as many subjects as possible for usable data collection and in order to avoid the test/retest threat to validity. It was assumed that the respondents in the pilot study were similar to those at the local gyms regarding their age, income, level of physical activity, and TRA construct measures.

There were two major changes suggested by the panel of experts/pilot study. The first was the rewording of the items gathering information regarding demographics. These items were fill-in-the-blank and quite vague. More specific wording was chosen and the item about ethnic background was changed. In the pilot study, responses on this item ranged from Italian to Jewish. Therefore, the item was changed to include six options: African-American, Hispanic, Caucasian, American Indian, Asian, and Other.
The second change eliminated all questions in the scale designed to gather knowledge about steroids and steroid use. This was done because the Theory of Reasoned Action does not include knowledge as a component and the panel of experts felt that the knowledge series of items only lengthened the instrument without adding to the theoretical basis for the study.

Internal consistency of each section of the instrument was calculated using Cronbach's alpha. The resulting alpha coefficients may be found in Chapter Four of this study in the Discussion of the Independent Variable and Discussion of the Dependent Variable sections. The Grammatik V computer program was used to determine the readability of the instrument. The readability score was 74, meaning it was an average level for sixth to tenth graders. The grade level of the instrument was determined to be the fourth grade. The desired reading level was the eighth grade.

**DATA COLLECTION**

All data were collected by a self-administered questionnaire over a seven week period. Data collection began in April and was completed in June, 1994. The researcher was in a gym at least four hours for each of two days during one week. The hours of data collection varied each day in an attempt to reach as broad a range of members as possible.

Per the advice of the gym owners, the researcher sat behind the front desk of the gym lobby and asked each member who entered to fill out the questionnaire, put it in the provided envelope, seal the envelope, and then drop the envelope in a box.
which was also located in the lobby. Respondents were provided with an instrument, a pencil, a cover letter, a consent form, and the envelope in which to seal the completed questionnaire. The cover letter which explained the nature of the research and guaranteed anonymity and confidentiality was signed by the researcher and attached to each survey instrument. The instrument required approximately twenty minutes to complete.

For a summary of the verbal introduction and instructions given to each potential subject, see Appendix F. To see the cover letter and consent form used in this research, see Appendices G and H.

DATA CODING

Information gathered on each questionnaire was transformed to numerical values for purposes of data analysis. For a copy of the coding system used, see Appendix E.

DATA ANALYSIS

Descriptive and correlational statistics were used to analyze the collected data using SAS statistical software at The Ohio State University Computing Center. Scores for attitude toward the behavior, behavioral beliefs, outcome evaluations, and subjective norms were considered independent variables. To determine the subjective norms score, the responses on the "normative beliefs" scale were multiplied by the corresponding scores in the "motivation to comply" scale. The dependent variables in
this study were the reported stages of behavior change scores. Only the non-using stages were included in this study. Demographic information was used for descriptive purposes only.

Questionnaires that were returned and had no more than 25% unanswered were included as "respondents". Questionnaires that were returned, but not completed at least 75% complete (not including demographic items) were excluded from the data sample. These were considered as non-respondents when the response rate was calculated. An alpha level of .05 was selected a priori for all significance tests.

Pearson r Correlation Coefficients were calculated to determine the consistency of direction in the relation between the independent and dependent variables (Gravetter & Wallnau, 1992). The scale developed by Davis (1971) was used to measure the strength of the correlations. See Table 1.

<table>
<thead>
<tr>
<th>COEFFICIENT</th>
<th>DESCRIPTOR</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Perfect</td>
</tr>
<tr>
<td>0.70–0.99</td>
<td>Very high</td>
</tr>
<tr>
<td>0.50–0.69</td>
<td>Substantial</td>
</tr>
<tr>
<td>0.30–0.49</td>
<td>Moderate</td>
</tr>
<tr>
<td>0.10–0.29</td>
<td>Low</td>
</tr>
<tr>
<td>0.01–0.09</td>
<td>Negligible</td>
</tr>
</tbody>
</table>
In order to test the constructs of the Theory of Reasoned Action (TRA) to see how well they predicted intentions to use steroids, a reverse-stepwise multiple regression analysis was performed. The TRA, as applied in this study, had four independent variables (attitude toward the behavior, behavioral beliefs, outcome evaluations, and subjective norms) and all were included in the regression analysis despite their correlational values. Including as many variables as possible is important in Health Education because it deals with a diverse audience with a variety of needs and responses. Behavior and behavioral change are complex processes and using only a few constructs to begin to understand them would oversimplify the task. Programs developed based on as many variables related to health behavior change as possible would help to increase the effectiveness of Health Education programs. When more constructs to modify behavior are utilized, the chances of successfully changing behavior are increased.

**SAS COMMANDS USED FOR DATA ANALYSIS**

The SAS computer program available at The Ohio State University Instruction and Research Center was used for all data analysis.

**Internal Consistency of the Instrument**

Cronbach's Alpha was used to determine the internal consistency of the instrument used in this study. The SAS command used to do this was: PROC CORR ALPHA NOMISS. This command was repeated for each scale on the instrument.
Pearson r Correlations

In order to determine the degree of correlation between the independent and dependent variables, items measuring the same variable had to be combined. For example, items #11–#21 measured the second independent variable, Behavioral Beliefs. The command used to do this was: INDTWO = MEAN (OF BEHBEL11 BEHBEL12...). After this was done for each independent and each dependent variable, the PROC CORR command was used. This procedure requires that the variables being correlated be specified following the previous step. In this study, each independent variable was correlated with each dependent variable. The following example demonstrates how this was done for the first dependent variable, the Precontemplation Stage (DEPONE):

VAR INDONE DEPONE
VAR INDTWO DEPONE
VAR INDTHR DEPONE
VAR SUBINORM DEPONE.

Reverse Stepwise Regression

To determine the amount of variance accounted for by the Theory of Reasoned Action Constructs, a reverse stepwise regression was done. The alpha was set at 0.05.

A model was set up for each dependent variable and included all four independent variables. The SAS command to do this was: PROC REG;

MODEL DEPONE = INDONE INDTWO INDTHR SUBJNORM / SELECTION = BACKWARD SLSTAY = .05;
SUMMARY OF CHAPTER THREE

This causal-comparative study was conducted for the purposes of determining how well the four components of the Theory of Reasoned Action vary together and to see how well non-using stages of the Processes of Change Model may be predicted from knowledge of the four components. The self-reported data were collected from 157 young adult males (ages 18–25) who work out at one of four participating weightlifting gyms in Central Ohio. The 68-item written questionnaire developed by the researcher was reviewed by a panel of experts, a pilot study was conducted, and Cronbach's alpha coefficient was calculated for each of the nine scales. The SAS computer program available at the Ohio State University Computing Center was used for all data analysis, which included descriptive statistics, Pearson correlations, and reverse stepwise regression.
CHAPTER IV
FINDINGS

Restatement of Purpose

The purpose of this study was to test the Theory of Reasoned Action to see if it can predict steroid non-use, as measured by the first three stages in the Processes of Behavior Change, among physically active young adult males.

Research Questions

1) What are the attitudes, as measured by the components attitude toward the behavior, behavioral beliefs, and outcome evaluations of young adult males, ages 18-25, who are steroid non-users, in four Central Ohio gyms regarding anabolic steroid use?

2) What are the subjective norms, as measured the components normative beliefs and motivation to comply, regarding anabolic steroid use among non-users, according to young adult males, ages 18-25, in four Central Ohio gyms?

3) What are the associations between the attitude and subjective norms components and steroid non-use as measured by the non-using stages (Precontemplation, Contemplation, and Preparation) of the Processes of Change model as reported by young adult males, ages 18-25, in four Central Ohio gyms who currently do not use steroids?

4) To what degree do the attitude and subjective norms components account for variability in reported steroid non-use as measured by the non-using stages (Precontemplation, Contemplation, and Preparation) of the Processes of Change model as reported by young adult males, ages 18-25, in Central Ohio gyms who currently do not use steroids?
DESCRIPTION OF PARTICIPATING GYMS

The four gymnasiums that participated in this study were gyms designed primarily for purposes of strength training, weightlifting, and body building. The equipment in the facilities consisted mostly of free-weights and several stationary bicycles. None of the gyms had a pool, hot tub, sauna, or tennis or racquetball courts. Two of the gyms were located in the downtown area of Columbus and two of the gyms were in the suburbs in Central Ohio. Five private gyms in Columbus (one downtown, four in the suburbs) refused to participate in this study. They did not appear to differ from the gyms whose owners chose to participate in the study.

DESCRIPTION OF SAMPLE

Males at four gyms in central Ohio were asked to complete the 68-item questionnaire. A total of 251 potential subjects were approached. Two hundred five of those approached fell within the predetermined age bracket. Of the 205 subjects within the age bracket, 48 of them refused to participate. No further information was gathered from the 48 who refused. Many of them stated that they could not participate because they were short on time already. The remaining 157 males completed usable questionnaires, resulting in a 76% participation rate. There were no questionnaires less than 75% complete, so all questionnaires were used in the data sample. Therefore, in this case, the accepting sample was the same as the data sample.
Of 10,676 possible items on all 157 questionnaires in the data sample, 34 items were not completed. Sixteen of the 34 blank items were regarding race or income.

Because data were collected on a convenience sample basis, the percentages of usable questionnaires were not distributed equally among the participating gyms. Gym One represented 19.75% of the total, Gym Two represented 17.20%, Gym Three provided 17.83%, and Gym Four provided 45% of the total sample. See Table 2.

Table 2. Distribution of subjects across participating gyms*.

<table>
<thead>
<tr>
<th></th>
<th>APPROACHED</th>
<th>COMPLETED</th>
<th>REFUSED</th>
<th>NOT IN AGE GROUP</th>
<th>PERCENT OF USABLE SAMPLE</th>
</tr>
</thead>
<tbody>
<tr>
<td>GYM 1</td>
<td>40</td>
<td>31</td>
<td>4</td>
<td>5</td>
<td>19.75</td>
</tr>
<tr>
<td>GYM 2</td>
<td>50</td>
<td>27</td>
<td>7</td>
<td>16</td>
<td>17.20</td>
</tr>
<tr>
<td>GYM 3</td>
<td>45</td>
<td>28</td>
<td>5</td>
<td>12</td>
<td>17.83</td>
</tr>
<tr>
<td>GYM 4A</td>
<td>56</td>
<td>35</td>
<td>17</td>
<td>4</td>
<td>22.29</td>
</tr>
<tr>
<td>GYM 4B</td>
<td>28</td>
<td>16</td>
<td>7</td>
<td>6</td>
<td>10.19</td>
</tr>
<tr>
<td>GYM 4C</td>
<td>31</td>
<td>20</td>
<td>8</td>
<td>3</td>
<td>12.74</td>
</tr>
<tr>
<td>TOTALS</td>
<td>251</td>
<td>157</td>
<td>48</td>
<td>46</td>
<td>100</td>
</tr>
</tbody>
</table>

*Four of nine private gyms in Central Ohio agreed to participate in this study. Gym 4 was visited three times for data collection because the number of members there was much, much larger than the number of members at the other gyms.
Description of those not included in data sample

Of the 251 males approached by the researcher at the gyms, 46 did not fall within the age requirement (18–25). No other information was gathered about these people. Forty-eight of the 205 within the age window chose to not participate. No other information was gathered about these people. Often, one comment came from those who chose not to participate: I just don't have time.

Description of data sample

A total of 157 males were included in the data sample. The mean age of the sample was 21. See Table 3. The mean reported income was $9,210. See Table 4. The most often reported value for frequency of workout was three times per week, reported by 27% of the respondents. However, the mean frequency of workout was four times per week. The mean duration of consistent physical activity was 25 months. Eighty percent (120 subjects) reported their race as "Caucasian". See Table 5 for detail regarding "race".
Table 3. Frequency of reported age of subjects (n=157)

<table>
<thead>
<tr>
<th>AGE</th>
<th>FREQUENCY</th>
<th>PERCENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>18</td>
<td>15</td>
<td>9.6</td>
</tr>
<tr>
<td>19</td>
<td>25</td>
<td>15.9</td>
</tr>
<tr>
<td>20</td>
<td>33</td>
<td>21.0</td>
</tr>
<tr>
<td>21</td>
<td>19</td>
<td>12.1</td>
</tr>
<tr>
<td>22</td>
<td>18</td>
<td>11.5</td>
</tr>
<tr>
<td>23</td>
<td>17</td>
<td>10.8</td>
</tr>
<tr>
<td>24</td>
<td>15</td>
<td>9.6</td>
</tr>
<tr>
<td>25</td>
<td>15</td>
<td>9.6</td>
</tr>
</tbody>
</table>

Table 4. Frequency of reported income of subjects (n=157)

<table>
<thead>
<tr>
<th>INCOME</th>
<th>FREQUENCY</th>
<th>PERCENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>$0–$5,000</td>
<td>62</td>
<td>40.5</td>
</tr>
<tr>
<td>$6,000–$10,000</td>
<td>45</td>
<td>29.4</td>
</tr>
<tr>
<td>$11,000–$20,000</td>
<td>26</td>
<td>17.0</td>
</tr>
<tr>
<td>$21,000–$32,000</td>
<td>8</td>
<td>13.1</td>
</tr>
<tr>
<td>Missing</td>
<td>8</td>
<td></td>
</tr>
</tbody>
</table>
Table 5. Frequency of reported race of subjects (n=157)

<table>
<thead>
<tr>
<th>RACE</th>
<th>FREQUENCY</th>
<th>PERCENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>African-American</td>
<td>13</td>
<td>8.7</td>
</tr>
<tr>
<td>Hispanic</td>
<td>5</td>
<td>3.4</td>
</tr>
<tr>
<td>Caucasian</td>
<td>120</td>
<td>80.5</td>
</tr>
<tr>
<td>Asian</td>
<td>10</td>
<td>6.7</td>
</tr>
<tr>
<td>Other</td>
<td>1</td>
<td>0.7</td>
</tr>
<tr>
<td>Missing</td>
<td>8</td>
<td></td>
</tr>
</tbody>
</table>

Description of Participation in Sports

A large majority of the respondents, 98.7%, reported having participated in at least one organized sport or competition. Many of the respondents have participated in more than one sport. The sport with the highest frequency of participation was football. The sports which were not listed, but were indicated by respondents in the "other" option were: racquetball, rowing, billiards, and rugby. See Table 6. This item on the questionnaire did not specify a time-frame. It was possible subjects responded to this item if they had ever, during the course of their life, participated in the sport.
Table 6. Frequency of participation in sports (n=157)

<table>
<thead>
<tr>
<th>SPORT</th>
<th>FREQUENCY</th>
<th>PERCENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baseball</td>
<td>85</td>
<td>54.1</td>
</tr>
<tr>
<td>Football</td>
<td>99</td>
<td>63.1</td>
</tr>
<tr>
<td>Tennis</td>
<td>28</td>
<td>17.8</td>
</tr>
<tr>
<td>Wrestling</td>
<td>46</td>
<td>29.3</td>
</tr>
<tr>
<td>Basketball</td>
<td>62</td>
<td>39.5</td>
</tr>
<tr>
<td>Track &amp; Field</td>
<td>59</td>
<td>37.6</td>
</tr>
<tr>
<td>Volleyball</td>
<td>27</td>
<td>17.2</td>
</tr>
<tr>
<td>Softball</td>
<td>45</td>
<td>28.7</td>
</tr>
<tr>
<td>Swimming</td>
<td>25</td>
<td>15.9</td>
</tr>
<tr>
<td>Soccer</td>
<td>45</td>
<td>28.7</td>
</tr>
<tr>
<td>Power-lifting</td>
<td>31</td>
<td>19.9</td>
</tr>
<tr>
<td>Body-building</td>
<td>23</td>
<td>14.9</td>
</tr>
<tr>
<td>Other</td>
<td>26</td>
<td>16.9</td>
</tr>
<tr>
<td>No Sports</td>
<td>2</td>
<td>1.3</td>
</tr>
</tbody>
</table>

*Many respondents indicated they have participated in more than one sport, resulting in a frequency greater than 157.
DESCRIPTION OF THE INDEPENDENT VARIABLES

There were four independent variables in the Theory of Reasoned Action as it was applied in this study. They were attitude toward the behavior, behavioral beliefs, outcome evaluations, and subjective norms. The first three variables were components of the attitude construct and the fourth variable was measured by multiplying the two components of the subjective norm construct, normative beliefs and motivation to comply, as defined by Ajzen and Fishbein (1980).

Only responses of non-users were considered in the following calculations. Of the 157 respondents, 152 males fell into this category, therefore the n for each of the following tables is 152. These results show that there was a 3.1% rate of reported steroid use among the survey respondents.

The mean score for each item was determined by summing the response value for each subject and then dividing by the number of responses. The mean score for each scale was determined by summing the means for each item in the scale and then dividing by the number of items in the scale.

Description of Attitude toward the Behavior

The attitude toward a behavior was measured using ten statements to which respondents answered on a 6-point Likert-type scale. The bipolar adjectives Extremely bad and Extremely good were used for the attitude scale. Cronbach's Coefficient Alpha for this scale was equal to 0.867. The mean score for the scale was 2.11 with a Standard Deviation of 0.903. This indicates the general attitude toward
using steroids was quite bad. "Learning how to use steroids correctly is..." was the item that received the highest mean score (3.63, S.D.=1.92), indicating that respondents felt it was "somewhat good" to learn to use steroids correctly. Item #6, "Giving myself steroid injections is..." received the lowest mean score (1.53, S.D.=1.01) indicating that spending money to buy steroids is extremely bad. See Table 7 for a summary of response frequencies.

**Description of Behavioral Beliefs**

Behavioral beliefs were measured with 11 items scored on a 6-point Likert-type scale. A response of "1" corresponds to Extremely Unlikely and a response of "6" corresponds to Extremely Likely. The Alpha Coefficient for this scale was 0.750. The behavioral beliefs scale mean score was 4.19 (S.D.=0.744), indicating that respondents generally believed certain consequences, both good and bad ones, were likely to occur. Item #18, "Using steroids will increase my muscle mass", scored highest with a mean of 5.20 (S.D.=1.12), indicating beliefs that it was quite likely using steroids would increase the muscle mass of the user. Respondents indicated they believed they were "unlikely" to get in trouble with the law for using steroids, as reflected by a mean score of 3.41 (S.D.=1.73) on item #11. The frequency of responses is summarized in Table 8.
<table>
<thead>
<tr>
<th>Scale Mean = 2.11; Scale Standard Deviation = 0.903; alpha = 0.867</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
</tr>
<tr>
<td>---</td>
</tr>
<tr>
<td>1. Taking steroids to enhance my performance is...</td>
</tr>
<tr>
<td>2. Spending money to buy steroids is...</td>
</tr>
<tr>
<td>3. Taking steroids to enhance my appearance is...</td>
</tr>
<tr>
<td>4. Taking steroids is...</td>
</tr>
<tr>
<td>5. Purchasing steroids is...</td>
</tr>
<tr>
<td>6. Giving myself steroid injections is...</td>
</tr>
<tr>
<td>7. Swallowing a steroid pill is...</td>
</tr>
<tr>
<td>8. Initiating a conversation with someone about steroid use is...</td>
</tr>
<tr>
<td>9. Approaching someone about purchasing steroids is...</td>
</tr>
<tr>
<td>10. Learning how to use steroids correctly is...</td>
</tr>
</tbody>
</table>

* 1 = extremely bad; 2 = quite bad; 3 = somewhat bad; 4 = somewhat good; 5 = quite good; 6 = extremely good.
Table 8. Frequency, Mean, and SD of Responses on Behavioral Beliefs Scale (n=152).

<table>
<thead>
<tr>
<th>Scale Mean = 4.19; Scale Standard Deviation = 0.744; alpha = 0.750</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
</tr>
<tr>
<td>---------------------------------</td>
</tr>
<tr>
<td>11. Using steroids will get me in trouble with the law.</td>
</tr>
<tr>
<td>12. Using steroids will cause my face to break out.</td>
</tr>
<tr>
<td>13. Using steroids will make me stronger.</td>
</tr>
<tr>
<td>14. Using steroids will make me more attractive.</td>
</tr>
<tr>
<td>15. If I use steroids, I will have trouble performing sexually.</td>
</tr>
<tr>
<td>16. Steroid use will help me perform better in athletics.</td>
</tr>
<tr>
<td>17. If I use steroids, I'll be more aggressive.</td>
</tr>
<tr>
<td>18. Using steroids will increase my muscle mass.</td>
</tr>
<tr>
<td>19. Using steroids will cause my blood pressure to go up.</td>
</tr>
<tr>
<td>20. Using steroids will cause me to lose hair.</td>
</tr>
<tr>
<td>21. Steroid use will increase my muscle definition.</td>
</tr>
</tbody>
</table>

* 1=extremely unlikely; 2=quite unlikely; 3=somewhat unlikely; 4=somewhat likely; 5=quite likely; 6=extremely likely
Description of Outcome Evaluation

The Outcome Evaluation construct was measured with eleven items whose content correlated with the items in the Behavioral Beliefs scale. The bipolar adjectives used were Extremely Bad and Extremely Good. A score of 1 was assigned to the extremely bad response, 2 = quite bad, 3 = slightly bad, 4 = slightly good, 5 = quite good, and 6 = extremely good. The Coefficient Alpha for this scale was 0.882. The mean score of this scale was 2.29 (S.D.=1.006) which indicated respondents thought the consequences associated with steroid use were "Quite Bad". The highest scoring item was #32, "Having more muscle definition due to using steroids is...", with a mean of 3.29 and a Standard Deviation of 1.80. Item #26 received the lowest mean score (1.39, S.D.=0.877) indicating that "Having trouble performing sexually is..." extremely bad. See Table 9 for response frequencies.

Description of Normative Beliefs

Normative beliefs were measured by a seven-item scale scored using a six-point Likert type scale. The scoring was as follows: Extremely Unlikely = 1, Quite Unlikely = 2, Somewhat Unlikely = 3, Somewhat Likely = 4, Quite Likely = 5, Extremely Likely = 6. Cronbach's Coefficient Alpha for the Normative Beliefs scale was 0.900. The mean score for this scale was 1.42 with a Standard Deviation of 0.666. This means the respondents generally felt it was "Quite Unlikely" that a variety of people think they should use steroids. Item #41 scored the lowest mean (1.14, S.D.=0.42) indicating that it was "Extremely Unlikely" that "my family thinks I
should use steroids." Item #39, "My friends at the gym think I should use steroids," scored the highest mean (1.97, S.D.=1.29), meaning the respondents believed that of all the people listed in the questionnaire, their friends at the gym were the ones most likely to think they should use steroids. Response frequencies are summarized in Table 10.

Description of Motivation to Comply

The Motivation to Comply scale was measured using a six-point semantic differential format with the bipolar adjectives of Absolutely Never and Absolutely Always. The alpha coefficient for this scale was 0.822. The mean score of the scale was 3.43 with a Standard Deviation of 0.957. Item #52, "I try to do what pleases people who are important to me", scored the highest mean (4.37, S.D.=1.26). The lowest mean score (1.80, S.D.=1.10) was received by Item #46, "I try to do what pleases my friends at the gym". See Table 11.

Description of the Subjective Norms Variable

The fourth independent variable, subjective norms, was determined by multiplying each response in the normative beliefs scale by the corresponding response in the motivation to comply scale. The Mean and Standard Deviation for each subjective norm reference may be found in Table 12. The numerical value in this scale refers to the strength of the perception that the subject tries to do as the referent wishes.
Table 9. Frequency, Mean, and SD of Responses on Outcome Evaluation scale (n=152)

<table>
<thead>
<tr>
<th>Scale Mean = 2.29; Scale Standard Deviation = 1.006; alpha = 0.882</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
<tr>
<td>---</td>
</tr>
<tr>
<td>22. Getting in trouble with the law for steroid use is...</td>
</tr>
<tr>
<td>23. Having my face to break out because of steroid use is...</td>
</tr>
<tr>
<td>24. Being stronger because of using steroids is...</td>
</tr>
<tr>
<td>25. Being more attractive due to steroid use is...</td>
</tr>
<tr>
<td>26. Having trouble performing sexually is...</td>
</tr>
<tr>
<td>27. Improvement in athletic performance due to steroid use is...</td>
</tr>
<tr>
<td>28. Being more aggressive due to steroid use is...</td>
</tr>
<tr>
<td>29. Increasing my muscle mass by using steroids is...</td>
</tr>
<tr>
<td>30. Having a higher blood pressure from using steroids is...</td>
</tr>
<tr>
<td>31. Losing hair because of steroid use is...</td>
</tr>
<tr>
<td>32. Having more muscle definition due to using steroids is...</td>
</tr>
</tbody>
</table>

* 1=extremely bad; 2=quite bad; 3=somewhat bad; 4=somewhat good; 5=quite good; 6=extremely good
Table 10. Frequency, Mean, and Standard Deviation of Responses for Normative Beliefs scale (n=152)

<table>
<thead>
<tr>
<th>Scale Mean = 1.42; Scale Standard Deviation = 0.666; alpha = 0.90</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
</tr>
<tr>
<td>----------------</td>
</tr>
<tr>
<td>39. My friends at the gym think I should use steroids.</td>
</tr>
<tr>
<td>40. My friends outside the gym think I should use steroids.</td>
</tr>
<tr>
<td>41. My family think I should use steroids.</td>
</tr>
<tr>
<td>42. My dating partner(s) thinks I should use steroids.</td>
</tr>
<tr>
<td>43. People I'm interested in sexually think I should use steroids.</td>
</tr>
<tr>
<td>44. Health care professionals think I should use steroids.</td>
</tr>
<tr>
<td>45. People who are important to me think I should use steroids.</td>
</tr>
</tbody>
</table>

* 1=extremely unlikely; 2=quite unlikely; 3=somewhat unlikely; 4=somewhat likely; 5=quite likely; 6=extremely likely
Table 11. Frequency, Mean, and SD of Responses for Motivation to Comply scale (n=152)

<p>| Scale Mean = 3.43; Scale Standard Deviation = 0.957; alpha = 0.822 |
|---|---|---|---|---|---|---|---|---|</p>
<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>MISSING</th>
<th>(\bar{X})</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>46.</td>
<td>I try to do what pleases my friends at the gym.</td>
<td>84</td>
<td>35</td>
<td>16</td>
<td>13</td>
<td>4</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>47.</td>
<td>I try to do what pleases my friends outside the gym.</td>
<td>43</td>
<td>26</td>
<td>28</td>
<td>42</td>
<td>10</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>48.</td>
<td>I try to do what pleases my family.</td>
<td>14</td>
<td>7</td>
<td>15</td>
<td>49</td>
<td>52</td>
<td>15</td>
<td>0</td>
</tr>
<tr>
<td>49.</td>
<td>I try to do what my dating partner(s) thinks I should do.</td>
<td>17</td>
<td>18</td>
<td>33</td>
<td>44</td>
<td>29</td>
<td>11</td>
<td>0</td>
</tr>
<tr>
<td>50.</td>
<td>I try to do what pleases people I'm interested in sexually.</td>
<td>21</td>
<td>24</td>
<td>32</td>
<td>34</td>
<td>25</td>
<td>16</td>
<td>0</td>
</tr>
<tr>
<td>51.</td>
<td>I try do what health care professionals think I should do.</td>
<td>11</td>
<td>11</td>
<td>21</td>
<td>42</td>
<td>48</td>
<td>19</td>
<td>0</td>
</tr>
<tr>
<td>52.</td>
<td>I try to do what pleases people who are important to me.</td>
<td>6</td>
<td>9</td>
<td>15</td>
<td>38</td>
<td>59</td>
<td>24</td>
<td>1</td>
</tr>
</tbody>
</table>

* 1=absolutely never; 2=almost never; 3=somewhat never; 4=somewhat always; 5=almost always; 6=absolutely always
Table 12. Mean and Standard Deviation for Subjective Norms Variable (n=152)

<table>
<thead>
<tr>
<th>Norm Regarding...</th>
<th>X</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Friends at the gym</td>
<td>3.14</td>
<td>0.71</td>
</tr>
<tr>
<td>Friends outside the gym</td>
<td>3.90</td>
<td>0.71</td>
</tr>
<tr>
<td>Family</td>
<td>3.90</td>
<td>0.43</td>
</tr>
<tr>
<td>Dating partner</td>
<td>4.09</td>
<td>0.82</td>
</tr>
<tr>
<td>People interested in sexually</td>
<td>4.52</td>
<td>0.89</td>
</tr>
<tr>
<td>Health care professionals</td>
<td>3.85</td>
<td>0.41</td>
</tr>
<tr>
<td>People who are important</td>
<td>4.65</td>
<td>0.58</td>
</tr>
<tr>
<td>Scale totals</td>
<td>4.00</td>
<td>1.13</td>
</tr>
</tbody>
</table>

*1=negligible; 2=very weak; 3=weak; 4=somewhat; 5=strong; 6=very strong
DESCRIPTION OF THE DEPENDENT VARIABLE

The dependent variable in this study measured the respondents' intentions to not use steroids. The scale was a six-point Likert-type with rankings ranging from 1 (Strongly Disagree) to 6 (Strongly Agree). The items in the scale were written to correspond to Prochaska and DiClemente's Stages of Behavior Change Theory.

This research project was concerned only with the respondents who were, at the time of data collection, steroid non-users (precontemplation, contemplation, or preparation stages). Non-users were considered to be those respondents whose mean score for Items 53–63 was greater than 3. Of the 157 respondents, 152 males fell into this category. Users were considered to be those respondents whose scores on the maintenance and cessation items (#64–68) had a mean equal to or greater than 4. Of the 157 respondents, five fell into this category, resulting in a 3.1% reported use rate.

The three dependent variables were determined using the responses from all subjects who did not have a mean score equal to or greater than 4 on items #64–68, as such a score would have put them into the "User" category. All subjects scores were used to determine the mean and standard deviation for each of the three dependent variables, which were Precontemplation (#53–56), Contemplation (#57–60), and Preparation (#61–63).
Description of the Precontemplation Responses

Four items measured the Precontemplation stage of behavior change.

Cronbach’s Coefficient Alpha for this part of the scale was 0.917. A summary of frequency of responses may be found in Table 13.

Table 13. Frequency, Mean, and SD of Responses on Precontemplation items (n=152)

<table>
<thead>
<tr>
<th>Item</th>
<th>Frequency</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>53. I have never considered using steroids.</td>
<td>33, 27, 11, 11, 18, 52, 0</td>
<td>3.72</td>
<td>2.04</td>
</tr>
<tr>
<td>54. I have never considered discussing steroid use with friends.</td>
<td>48, 28, 14, 17, 12, 33, 0</td>
<td>3.11</td>
<td>1.96</td>
</tr>
<tr>
<td>55. I have never considered contacting someone who supplies steroids.</td>
<td>35, 16, 13, 5, 11, 72, 0</td>
<td>4.03</td>
<td>2.14</td>
</tr>
<tr>
<td>56. I have never considered purchasing steroids.</td>
<td>35, 17, 12, 2, 20, 66, 0</td>
<td>4.01</td>
<td>2.12</td>
</tr>
<tr>
<td>TOT</td>
<td>151, 88, 50, 35, 61, 223, 0</td>
<td>3.72</td>
<td>1.86</td>
</tr>
</tbody>
</table>

* 1=strongly disagree; 2=disagree; 3=slightly disagree; 4=slightly agree; 5=agree; 6=strongly agree
Description of the Contemplation Responses

There were four items which measured the Contemplation stage of behavior change. The Cronbach's alpha coefficient was 0.945. See Table 14 for a summary of the frequency of responses.

Table 14. Frequency, Mean, and SD of Responses on Contemplation Items (n=152)

<table>
<thead>
<tr>
<th>Item</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>MISSING</th>
<th>X</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>57.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>66</td>
<td>12</td>
<td>9</td>
<td>16</td>
<td>20</td>
<td>28</td>
<td>1</td>
<td>2.97</td>
<td>2.04</td>
</tr>
<tr>
<td>58.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>85</td>
<td>13</td>
<td>10</td>
<td>11</td>
<td>10</td>
<td>23</td>
<td>0</td>
<td>2.45</td>
<td>1.94</td>
</tr>
<tr>
<td>59.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>73</td>
<td>11</td>
<td>13</td>
<td>12</td>
<td>20</td>
<td>23</td>
<td>0</td>
<td>2.76</td>
<td>1.98</td>
</tr>
<tr>
<td>60.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>80</td>
<td>14</td>
<td>10</td>
<td>16</td>
<td>13</td>
<td>19</td>
<td>0</td>
<td>2.51</td>
<td>1.88</td>
</tr>
<tr>
<td>TOT</td>
<td>304</td>
<td>50</td>
<td>42</td>
<td>55</td>
<td>63</td>
<td>93</td>
<td>1</td>
<td>2.67</td>
<td>1.86</td>
</tr>
</tbody>
</table>

* 1=strongly disagree; 2=disagree; 3=slightly disagree; 4=slightly agree; 5=agree; 6=strongly agree
Description of the Preparation Responses

Three items, numbers 61–63, measured the Preparation stage of behavior change. The Cronbach's alpha for this part of the scale was 0.856. The response frequencies may be found in Table 15.

Table 15. Frequency, Mean, and SD of Responses of Preparation items (n=152).

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>MISSING</th>
<th>X</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>61.</td>
<td>I am in the process of saving money so I can buy steroids.</td>
<td>130</td>
<td>6</td>
<td>2</td>
<td>4</td>
<td>5</td>
<td>5</td>
<td>0</td>
<td>1.44</td>
</tr>
<tr>
<td>62.</td>
<td>I am in the process of talking with someone about which steroid to use.</td>
<td>132</td>
<td>6</td>
<td>3</td>
<td>1</td>
<td>4</td>
<td>6</td>
<td>0</td>
<td>1.40</td>
</tr>
<tr>
<td>63.</td>
<td>I am actively looking for a contact/supplier of steroids.</td>
<td>133</td>
<td>10</td>
<td>1</td>
<td>3</td>
<td>2</td>
<td>3</td>
<td>0</td>
<td>1.29</td>
</tr>
<tr>
<td>TOT</td>
<td>395</td>
<td>22</td>
<td>6</td>
<td>8</td>
<td>11</td>
<td>14</td>
<td>0</td>
<td>1.38</td>
<td>1.14</td>
</tr>
</tbody>
</table>

* 1=strongly disagree; 2=disagree; 3=slightly disagree; 4=slightly agree; 5=agree; 6=strongly agree
Description of User Responses

Five questions (Items #64–68) were designed to measure the Maintenance and Cessation stages of behavior change. The Coefficient Alpha was 0.790. The mean score for this section of the scale was 1.16. This score indicates that the respondents "Strongly Disagree" with statements and behaviors that are associated with steroid use. See Table 16 for a summary of frequencies.

Table 16. Frequency, Mean, and SD of Responses on User Items (n=152)

<table>
<thead>
<tr>
<th>RESPONSE</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>MISSING</th>
<th>X</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>64. I devote some of my income to buy steroids.</td>
<td>140</td>
<td>9</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>1.13</td>
<td>0.54</td>
</tr>
<tr>
<td>65. I have a supplier/source of steroids.</td>
<td>133</td>
<td>7</td>
<td>1</td>
<td>3</td>
<td>2</td>
<td>6</td>
<td>0</td>
<td>1.37</td>
<td>1.15</td>
</tr>
<tr>
<td>66. I currently am using steroids.</td>
<td>144</td>
<td>5</td>
<td>1</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1.13</td>
<td>0.66</td>
</tr>
<tr>
<td>67. I used steroids in the past but no longer do so.</td>
<td>144</td>
<td>4</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>1</td>
<td>0</td>
<td>1.13</td>
<td>0.70</td>
</tr>
<tr>
<td>68. I am currently between steroid cycles.</td>
<td>145</td>
<td>3</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>1.04</td>
<td>0.28</td>
</tr>
<tr>
<td>TOTALS</td>
<td>706</td>
<td>28</td>
<td>3</td>
<td>6</td>
<td>5</td>
<td>8</td>
<td>3</td>
<td>1.16</td>
<td></td>
</tr>
</tbody>
</table>

* 1=strongly disagree; 2=disagree; 3=slightly disagree; 4=slightly agree; 5=agree; 6=strongly agree
DESCRIPTION OF RESPONSES BY BEHAVIOR STAGE

The Stage of Behavior Change for each subject was determined by first summing his responses to the items in each scale and then dividing the sum by the number of items in that scale. If a subject's mean score was four (4) or greater for any scale, he was considered to be in that stage. There were 89 subjects whose scores placed them in the Precontemplation Stage, 44 whose scores placed them in the Contemplation Stage, 19 whose scores placed them in the Preparation Stage, 5 whose scores placed them in the User category, and none whose responses included the subject in zero or more than one stage. The five subjects who were in the User stage were dropped from all analyses. The mean scores for each component of the TRA are examined in the following sections.

Precontemplation Responses

There were 89 subjects whose scores on the dependent variable items placed them in the Precontemplation Stage of behavior change. See Table 17 for information regarding the scores of these subjects on the Independent variables.
Table 17. Component Mean Scores for the Precontemplation Stage \( (n=89) \)

<table>
<thead>
<tr>
<th>VARIABLE</th>
<th>MEAN</th>
<th>STD. DEV.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attitude</td>
<td>1.71</td>
<td>0.636</td>
</tr>
<tr>
<td>Behavioral Belief</td>
<td>4.39</td>
<td>0.827</td>
</tr>
<tr>
<td>Outcome Evaluation</td>
<td>2.10</td>
<td>0.96</td>
</tr>
<tr>
<td>Subjective Norm</td>
<td>3.96</td>
<td>0.66</td>
</tr>
</tbody>
</table>

Contemplation Responses

There were 44 subjects whose scores on the dependent variable scales placed them in the Contemplation Stage of Behavior Change. Their mean scores for the components of the TRA are summarized in Table 18.

Table 18. Component Mean Scores for the Contemplation Stage \( (n=44) \)

<table>
<thead>
<tr>
<th>VARIABLE</th>
<th>MEAN</th>
<th>STD. DEV.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attitude</td>
<td>2.46</td>
<td>0.82</td>
</tr>
<tr>
<td>Behavioral Beliefs</td>
<td>4.28</td>
<td>0.69</td>
</tr>
<tr>
<td>Outcome Evaluation</td>
<td>2.84</td>
<td>0.89</td>
</tr>
<tr>
<td>Subjective Norms</td>
<td>4.68</td>
<td>0.43</td>
</tr>
</tbody>
</table>

Preparation Responses

The scores of 19 subjects placed them in the Preparation Stage of Behavior Change. See Table 19 for a summary of their scores on the four component scales.
Table 19. Component Mean Scores for the Preparation Stage (n=19)

<table>
<thead>
<tr>
<th>VARIABLE</th>
<th>MEAN</th>
<th>STD. DEV.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attitude</td>
<td>2.13</td>
<td>1.02</td>
</tr>
<tr>
<td>Behavioral Beliefs</td>
<td>3.97</td>
<td>0.99</td>
</tr>
<tr>
<td>Outcome Evaluation</td>
<td>2.46</td>
<td>1.30</td>
</tr>
<tr>
<td>Subjective Norms</td>
<td>2.64</td>
<td>0.211</td>
</tr>
</tbody>
</table>

The following table (Table 20) is a comparison of mean scores for each independent variable for each stage of behavior change as well as the combined mean score that was used in the regression analysis.

Table 20. Comparison of Mean Scores on Independent Variables

<table>
<thead>
<tr>
<th>VARIABLE</th>
<th>PRECONTEM</th>
<th>CONTEMP</th>
<th>PREP</th>
<th>ALL SS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attitude</td>
<td>1.71</td>
<td>2.47</td>
<td>2.13</td>
<td>2.11</td>
</tr>
<tr>
<td>Beh. Beliefs</td>
<td>4.39</td>
<td>4.28</td>
<td>3.97</td>
<td>4.19</td>
</tr>
<tr>
<td>Outcome Eval</td>
<td>2.10</td>
<td>2.84</td>
<td>2.46</td>
<td>2.29</td>
</tr>
<tr>
<td>Subjective Norms</td>
<td>3.96</td>
<td>4.68</td>
<td>2.64</td>
<td>4.00</td>
</tr>
<tr>
<td>n =</td>
<td>89</td>
<td>44</td>
<td>19</td>
<td>152</td>
</tr>
</tbody>
</table>

76
A Pearson r Correlation was used to describe the relationships between the Theory of Reasoned Action (TRA) constructs and the three non-user stages of behavior change. See Table 21. This was done by correlating the scores from all subjects who were non-users on each of the independent variables with each of the three dependent variables.

Table 21. Pearson Correlation Coefficients for the Theory of Reasoned Action Constructs and the Stages of Behavior Change \( (n=152) \)

<table>
<thead>
<tr>
<th></th>
<th>PRECONTEMP</th>
<th>CONTEMP</th>
<th>PREPARATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>ATTITUDE TOWARD THE BEHAVIOR</td>
<td>-0.546*</td>
<td>0.559*</td>
<td>0.532*</td>
</tr>
<tr>
<td>BEHAVIORAL BELIEF</td>
<td>0.119</td>
<td>-0.038</td>
<td>-0.119</td>
</tr>
<tr>
<td>OUTCOME EVALUATION</td>
<td>-0.417*</td>
<td>0.443*</td>
<td>0.318*</td>
</tr>
<tr>
<td>SUBJECTIVE NORMS</td>
<td>-0.283</td>
<td>0.364*</td>
<td>0.489</td>
</tr>
</tbody>
</table>

*Significant at the 0.05 level.

The descriptors used to describe the magnitude of the relationships were based on the scheme developed by Davis (1971). The relationship between Behavioral Beliefs and any of the stages of behavior change was, at best, a low association. The remaining relationships were at least moderate associations.
The relationship between Attitude toward the behavior and any stage of behavior change was substantial \((-0.546, 0.559, 0.532)\). The relationship between Outcome Evaluation and the three individual stages of behavior change was moderate \((-0.417, 0.443, 0.318)\). The subjective norms variable had at least moderate correlations with each of the three dependent variables.

**CORRELATION OF INDEPENDENT VARIABLES**

For the purpose of determining the degree to which the independent variables were inter-related, a Pearson correlation was executed. A statistically significant amount of correlation was found between all of the variables except the Behavioral Beliefs scale. The results are in Table 22.

<table>
<thead>
<tr>
<th>VARIABLE</th>
<th>ATTITUDE</th>
<th>BEH BEL</th>
<th>OUTCOME EVALUATIONS</th>
<th>SUBJ NORM</th>
</tr>
</thead>
<tbody>
<tr>
<td>ATTITUDE</td>
<td>1.000</td>
<td>-0.263*</td>
<td>0.602*</td>
<td>0.496*</td>
</tr>
<tr>
<td>BEH BEL</td>
<td>-0.263*</td>
<td>1.000</td>
<td>-0.110</td>
<td>-0.120</td>
</tr>
<tr>
<td>OUTCOME EVALUATION</td>
<td>0.602*</td>
<td>-0.110</td>
<td>1.000</td>
<td>0.416*</td>
</tr>
<tr>
<td>SUBJ NORM</td>
<td>0.496*</td>
<td>-0.120</td>
<td>0.416*</td>
<td>1.000</td>
</tr>
</tbody>
</table>

* = significant at the 0.05 level
CORRELATIONS BETWEEN DEPENDENT VARIABLES

In order to determine the amount of inter-relation existing between the dependent variables, a Pearson correlation was used. There was a statistically significant amount of correlation among all of the dependent variables. See Table 23 for a summary of the results.

Table 23. Pearson Correlations for Dependent Variables (n=152)

<table>
<thead>
<tr>
<th>VARIABLE</th>
<th>PRECON</th>
<th>CONTEMP</th>
<th>PREP</th>
</tr>
</thead>
<tbody>
<tr>
<td>PRECON</td>
<td>1.000</td>
<td>-0.797*</td>
<td>-0.450*</td>
</tr>
<tr>
<td>CONTEMP</td>
<td>-0.797*</td>
<td>1.000</td>
<td>0.562*</td>
</tr>
<tr>
<td>PREP</td>
<td>-0.450*</td>
<td>0.562*</td>
<td>1.000</td>
</tr>
</tbody>
</table>

* = significant at the 0.05 level

Reverse Stepwise Regression Results

There were three separate regression models designed for this study. Each model was based on one dependent variable and included all four independent variables. All non-using subjects were included in all of the regression models.

The Precontemplation Regression Model

The $R^2$ value for the model including all independent variables was 0.3159. One of the variables, attitude toward the behavior, was significant at the 0.05 level. This variable accounted for 29.8% of the variance. For more information regarding the Precontemplation regression model, see Tables 24 and 25.
Table 24. Retained Reverse Regression Model* for the Precontemplation Stage of Behavior Change (n=152)

<table>
<thead>
<tr>
<th>VARIABLE</th>
<th>SS</th>
<th>F</th>
<th>PROB F</th>
<th>MEAN SQUARE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Retained Model</td>
<td>514.71</td>
<td>63.78</td>
<td>0.0001</td>
<td>153.55</td>
</tr>
<tr>
<td>Attitude</td>
<td>153.55</td>
<td>63.78</td>
<td>0.0001</td>
<td>-----</td>
</tr>
</tbody>
</table>

*The R² for this model was 0.2983.

Table 25. Full Regression Model* for the Precontemplation Stage of Behavior Change (n=152)

<table>
<thead>
<tr>
<th>VARIABLE</th>
<th>SS</th>
<th>F</th>
<th>PROB F</th>
<th>MEAN SQUARE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Full Model</td>
<td>514.71</td>
<td>16.97</td>
<td>0.0001</td>
<td>40.655</td>
</tr>
<tr>
<td>Attitude</td>
<td>60.46</td>
<td>25.24</td>
<td>0.0001</td>
<td>-----</td>
</tr>
<tr>
<td>Behavioral Belief</td>
<td>0.52</td>
<td>0.22</td>
<td>0.6402</td>
<td>-----</td>
</tr>
<tr>
<td>Outcome Evaluation</td>
<td>7.26</td>
<td>3.03</td>
<td>0.0838</td>
<td>-----</td>
</tr>
<tr>
<td>Subjective Norm</td>
<td>0.40</td>
<td>0.17</td>
<td>0.6815</td>
<td>-----</td>
</tr>
</tbody>
</table>

*The R² for this model was 0.3159.
The Contemplation Regression Model

The $R^2$ value for the model including all four independent variables was 0.3612. There were two independent variables left in the model at the 0.05 significance level. They were Attitudes and Outcome Evaluation. These variables accounted for 33.5% of the variance. For detail regarding the Contemplation regression model, see Tables 26 and 27.

Table 26. Retained Reverse Regression Model* for the Contemplation Stage of Behavior Change (n=152)

<table>
<thead>
<tr>
<th>VARIABLE</th>
<th>SS</th>
<th>F</th>
<th>PROB F</th>
<th>MEAN SQUARE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Retained Model</td>
<td>494.93</td>
<td>37.53</td>
<td>0.0001</td>
<td>82.89</td>
</tr>
<tr>
<td>Attitude</td>
<td>68.41</td>
<td>30.97</td>
<td>0.0001</td>
<td>-----</td>
</tr>
<tr>
<td>Outcome Evaluation</td>
<td>10.98</td>
<td>4.97</td>
<td>0.0272</td>
<td>-----</td>
</tr>
</tbody>
</table>

*The $R^2$ for this model was 0.3349.

Table 27. Full Reverse Regression Model* for the Contemplation Stage of Behavior Change (n=152)

<table>
<thead>
<tr>
<th>VARIABLE</th>
<th>SS</th>
<th>F</th>
<th>PROB F</th>
<th>MEAN SQUARE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Full Model</td>
<td>494.93</td>
<td>20.78</td>
<td>0.0001</td>
<td>44.69</td>
</tr>
<tr>
<td>Attitude</td>
<td>56.49</td>
<td>26.26</td>
<td>0.0001</td>
<td>-----</td>
</tr>
<tr>
<td>Outcome Evaluation</td>
<td>7.77</td>
<td>3.62</td>
<td>0.0592</td>
<td>-----</td>
</tr>
<tr>
<td>Behav Belief</td>
<td>7.06</td>
<td>3.28</td>
<td>0.0720</td>
<td>-----</td>
</tr>
<tr>
<td>Subjective Norm</td>
<td>6.04</td>
<td>2.81</td>
<td>0.0959</td>
<td>-----</td>
</tr>
</tbody>
</table>

*The $R^2$ for this model was 0.3612.
The Preparation Regression Model

The R² for the full model was 0.3643. Two independent variables (Attitude toward the Behavior and Subjective Norms) were significant at the 0.05 level of significance. These variables accounted for 36.2% of the variance. For more information about this regression model, see Tables 28 and 29.

Table 28. Retained Reverse Regression Model* for the Preparation Stage of Behavior Change (n=152).

<table>
<thead>
<tr>
<th>VARIABLE</th>
<th>SS</th>
<th>F</th>
<th>PROB F</th>
<th>MEAN SQUARE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Retained Model</td>
<td>140.37</td>
<td>42.36</td>
<td>0.0001</td>
<td>25.44</td>
</tr>
<tr>
<td>Attitude</td>
<td>17.22</td>
<td>28.66</td>
<td>0.0001</td>
<td></td>
</tr>
<tr>
<td>Subjective Norm</td>
<td>11.20</td>
<td>18.65</td>
<td>0.0001</td>
<td></td>
</tr>
</tbody>
</table>

*The R² for this model was 0.3625.

Table 29. Full Reverse Regression Model* for the Preparation Stage of Behavior Change (n=152).

<table>
<thead>
<tr>
<th>VARIABLE</th>
<th>SS</th>
<th>F</th>
<th>PROB F</th>
<th>MEAN SQUARE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Full Model</td>
<td>140.37</td>
<td>21.06</td>
<td>0.0001</td>
<td>12.78</td>
</tr>
<tr>
<td>Attitude</td>
<td>13.76</td>
<td>22.66</td>
<td>0.0001</td>
<td></td>
</tr>
<tr>
<td>Behav Belief</td>
<td>0.19</td>
<td>0.32</td>
<td>0.5751</td>
<td></td>
</tr>
<tr>
<td>Outcome Eval</td>
<td>0.08</td>
<td>0.13</td>
<td>0.7163</td>
<td></td>
</tr>
<tr>
<td>Subjective Norm</td>
<td>11.26</td>
<td>18.55</td>
<td>0.0001</td>
<td></td>
</tr>
</tbody>
</table>

*The R² for this model was 0.3643.
Summary of respondents not included in regression

There were five respondents whose scores on the User items (#64–68) classified them as current or previous steroid users. None of these respondents were included in any of the regression models.

SUMMARY OF FINDINGS

One hundred fifty-seven young adult males were included in the data sample. The mean age of respondents was 21. The average annual income was $9,200. Nearly 80% of the respondents were Caucasian. All but two of the respondents reported participating in at least one organized sport or competition during their lifetime. Football and baseball were the two sports with the highest participation rates. The mean frequency of workout was four times in one week and the average respondent had been working out regularly for 25 months.

There were four independent variables in this study. All were measured on a six-point Likert scale. The mean score for the attitude scale was 2.11 (SD=0.90), indicating an overall attitude that steroids were "Quite Bad". The behavioral belief scale mean score was 4.19 (SD=0.74), generally indicating the respondents thought it to be "Somewhat Likely" that a variety of consequences associated with steroid use would occur. A mean score of 2.29 (SD=1.00) was reported for the outcome evaluation scale. This score indicated the general feeling that a variety of consequences associated with steroid use were "Quite Bad". In order to determine a
score for the fourth independent variable, Subjective Norms, the normative beliefs and motivation to comply scales were multiplied together as suggested by Ajzen and Fishbein (1980). The mean score for this variable was 4.00 (SD=1.13).

Of the 157 males who filled out questionnaires, 89 were reported to be in the Precontemplation stage of Behavior change, 44 reported they were in the contemplation stage, 19 reported they were in the preparation stage, and five reported they were current steroid users.

The Pearson r correlation was performed to determine the magnitude of the relationship between each of the four independent variables and the scores on the dependent variable (each of the three stages of behavior change.) The relationships between one independent variable, Behavioral Beliefs, and all stages of behavior change were extremely low. The relationships between the other three independent variables and the dependent variables were at least moderate.

The Pearson correlations showed that there was significant inter-relation between all of the independent variables, with the exception of the "Behavioral Beliefs" component. There was also moderate correlation between the scores on each of the stages of the dependent variables.

Reverse stepwise regression was done to determine which variables were significant at the 0.05 level and to determine the amount of variance accounted for by the variables. There were three regression models (one for each of the three stages of behavior change) which included all four independent variables. The precontemplation model accounted for 31.5% of the variance and one variable was significant at the
0.05 level. This was the attitude toward the behavior variable and it accounted for 29.8% of the variance. The full contemplation model had an $R^2$ of 0.3612. Attitudes and Outcome Evaluations were the variables left at the 0.05 level of significance. The $R^2$ for the full preparation model was 0.3643. The attitudes and subjective norms variables were significant at the 0.001 level and accounted for 36.2% of the total variance.
CHAPTER V

DISCUSSIONS, CONCLUSIONS, IMPLICATIONS, AND RECOMMENDATIONS

Restatement of Purpose

The purpose of this study was to test the Theory of Reasoned Action to see if it can predict steroid non-use, as measured by the first three stages in the Processes of Behavior Change, among physically active young adult males.

Research Questions

1) What is the attitude, measured by the components attitude toward the behavior, behavioral beliefs, and outcome evaluations of young adult males, ages 18-25, who are steroid non-users, in four Central Ohio gyms regarding anabolic steroid use?

2) What are the subjective norms, measured by the components normative beliefs and motivation to comply, regarding anabolic steroid use among non-users, according to young adult males, ages 18-25, in four Central Ohio gyms?

3) What are the associations between the attitude and subjective norms components and steroid non-use as measured by the non-using stages (Precontemplation, Contemplation, and Preparation) of the Processes of Change model as reported by young adult males, ages 18-25, in four Central Ohio gyms who currently do not use steroids?

4) To what degree do the attitude and subjective norms components account for variability in reported steroid non-use as measured by the non-using stages (Precontemplation, Contemplation, and Preparation) of the Processes of Change model as reported by young adult males, ages 18-25, in Central Ohio gyms who currently do not use steroids?
This chapter will discuss the study findings, state conclusions, compare the findings to other research in this area, explore implications for Health Education practice, and make recommendations for future research on the topic of steroid use.

**SUMMARY OF RESEARCH**

**Methodology**

**Population**

The target population for this study was physically active young adult males in Central Ohio. The accessible population consisted of the 18–25 year old males who worked out at one of the four gyms whose owners agreed to participate in this study. The accepting sample consisted of those males who agreed to fill out the 68-item written questionnaire (n=157).

**Design**

This research was ex-post facto, or causal-comparative, static group comparison. It was designed to show how four independent variables (the components in the Theory of Reasoned Action) vary together and to see how well one's intentions to initiate steroid use can be predicted from knowledge of these four variables.

**Instrument Development**

The survey instrument was based on the formula for studies based on the Theory of Reasoned Action (Ajzen & Fishbein, 1980). A panel of experts reviewed the instrument for content and face validity. The instrument was then pilot tested in a Health Education 103 class (Health in American Society) at The Ohio State
University. Internal consistency of each section was determined using Cronbach’s alpha correlation coefficient. Appropriate revisions were then made on the instrument.

Data Collection

Data collection took place at four private gyms in Central Ohio. The researcher visited each gym several times and sat in the lobby of the gym and asked each male who entered to fill out the 68-item written questionnaire. A copy of the questionnaire may be found in Appendix C. Respondents were provided with an instrument, a pencil, a cover letter, a consent form, and an envelope in which to seal the completed questionnaire. The instrument required approximately twenty minutes to complete. For a summary of the verbal introduction and instructions given to each potential subject, please see Appendix F. To see the cover letter and consent form used in this research, see Appendices G and H.

Study Findings

Demographics

One hundred fifty-seven young adult males were included in the data sample. The mean age of respondents was 21. The average annual income was $9,200. Nearly 80% of the respondents were Caucasian. All but two of the respondents reported participating in at least one organized sport or competition at some point in their lifetime. Football and baseball were the two sports with the highest participation rates. The mean frequency of workout was four times in one week and the average respondent had been working out regularly for 25 months.
Theory of Reasoned Action Constructs

There were four independent variables in this study. All were measured on a six-point Likert scale. The mean score for the attitude scale was 2.11 (SD=0.90), indicating an overall attitude that steroids were "Quite Bad". The behavioral belief scale mean score was 4.19 (SD=0.74), generally indicating the respondents thought it to be "Somewhat Likely" that a variety of consequences associated with steroid use would occur. A mean score of 2.29 (SD=1.00) was reported for the outcome evaluations scale. This score indicated the general feeling that a variety of consequences associated with steroid use were "Quite Bad". The mean score for normative beliefs was 1.42 (SD=0.66), indicating that it was "Extremely Unlikely" that various people thought the respondent should use steroids. The scale for the fifth independent variable, the motivation to comply, had a mean score of 3.42 (SD=0.957). This suggested that the respondents had a slight tendency to do what they believed pleased people around them. The scores for the fourth independent variable, the Subjective Norms, were determined by multiplying together the normative beliefs response with its corresponding motivation to comply response. The mean score for this variable was 4.86 (SD=1.13).

Correlation between TRA Constructs and Stages of Behavior Change

The Pearson r correlation was performed to determine the magnitude of the relationship between each of the four independent variables and each of the three stages of behavior change. The relationships between the independent variable
Behavioral Beliefs, and all stages of behavior change were low or negligible. The relationships between the other three independent variables and the dependent variables were at least moderate.

The correlations between the Precontemplation stage and three variables (attitudes, outcome evaluations, and subjective norms) were statistically significant and magnitudes were in the negative direction. The correlation between the behavioral beliefs component was positive and statistically insignificant. In the cases of both the Contemplation and Preparation stages, correlations with three variables (attitudes, outcome evaluations, and subjective norms) were positive and statistically significant. The relationships with the behavioral beliefs component were negative and statistically insignificant. With regard to the theory, this implies that behavioral beliefs were not important to young adult males. It could also mean that another theory may fit this situation better.

Regression Results

Reverse stepwise regression was done to determine which variables were significant at the 0.05 level and to determine the amount of variance accounted for by the variables. There were three regression models (one for each of the three stages of behavior change) which included all four independent variables. The full precontemplation model accounted for 31.5% of the variance and the attitude variable, accounting for 29% of the variance, was significant at the 0.05 level. The full contemplation model had an $R^2$ of 0.361. Attitude toward the behavior and Outcome
Evaluations were the variables left at the 0.05 level of significance and accounted for 33.5% of the variance. The $R^2$ for the full preparation model was 0.364. The attitude and subjective norms variables were significant at the 0.001 level and accounted for 36% of the total variance.

**COMPARISON TO RESULTS OF OTHER STUDIES**

Although there were no research studies regarding steroid use and the Theory of Reasoned Action, there were several studies to which the findings of the present study may be carefully compared. These include descriptive studies of steroid use and theory-based studies researching behaviors other than steroid use.

**Descriptive Studies**

The present study determined there to be a self-reported 3% steroid use rate among 18–25 year old males who work out at one of the four gyms included in this study. The mean age was 22 years and most had participated in some sort of organized sport or competition.

One study (Buckley, Yesalis, & Freidl, 1988) reported finding a 6.6% prevalence of steroid use among twelfth-grade males across the United States. Although the study focused on a somewhat younger population, the subjects were also young adult males. Another study (Pope, Katz, & Champoux, 1988) found that 2% of male college students were using steroids. Their sample consisted of 21–23 year old male seniors attending three universities in the eastern United States. Fifteen of the
seventeen self-reported users were athletes. Chng and Moore (1990) studied 222 male college athletes. They found a 23% rate of steroid use among their population. The mean age of respondents was 22. Munro (1991) surveyed college students working out in gyms in Arizona and found 12% of the respondents reported having used steroids. Most of the respondents in this study reported being physically active.

Based upon these comparisons, the prevalence rate of steroid use and rates of participation in sports found in the present research study are within the believable range. One must remember when comparing these studies that the goal of the present study was not to determine a prevalence of steroid use or physical activity rate. Such comparisons serve only to give readers the confidence that the sample in this study was not unusual in some fashion. Variations in demographic results may be due to different age groups, regions of the country, levels of sport participation, and methods of data collection.

**Theory-based Studies**

The present study was based on the Theory of Reasoned Action. Results indicate that one of the four components of the TRA is higher than the other three. The attitude toward the behavior component was significant in each of the three regression models. It was the only significant component in the Precontemplation stage regression model, but it is moderately highly correlated with two of the other variables (0.602 and 0.496). Outcome Expectations was also significant in the
Contemplation stage and contributed additional unique variance over and above that contributed by attitudes toward the behavior. The Subjective Norms component was also significant in the Preparation stage.

There were no studies regarding steroid use and the TRA found in the review of the literature. There were, however, several TRA studies relating to other behaviors and those will be used for comparison.

Ross and McLaws (1992) studied the applicability of the TRA to condom use among homosexually active men. The subjective norms construct accounted for most of the variance associated with intentions to use condoms. London (1982) examined the attitudinal and social normative factors relating to intended alcohol abuse among pre-adolescents. When behavioral intention was predicted from the attitude toward the behavior and subjective norms, a multiple correlation coefficient of 0.36 was produced. This accounted for 14% of the variance in explaining the intention of the subjects to abuse alcohol. Budd, Bleiker, and Spencer (1983) studied the application of reasoned action to predict and explain the marijuana use of young adults attending a British university. It was found through a step-wise discriminant analysis that non-user’s behavior result from their perception of the potential harm of using the drug (Outcome Expectations) and their belief that others would expect them not to use it (Normative Beliefs).

Although these studies were also based on the Theory of Reasoned Action, one must remember to be cautious when trying to apply findings based on one behavior to a different behavior. It seems, though, that Attitude, Outcome Evaluations, and
Normative beliefs have been the significant components in other research studies (London, 1982; Budd, Bleiker, & Spencer, 1983). It appears that the amounts of variance accounted for by the significant components in this study are at least moderate, compared to the amount accounted for in other health-related applications of the Theory of Reasoned Action.

DISCUSSION OF FINDINGS

The present study utilized Pearson Product-Moment Correlations to determine the consistency and direction of the relationships between the four independent variables and the three dependent variables. This study also included three separate backward regression models. Each of the four components of the Theory of Reasoned Action were included in all regression models despite their correlational values.

Discussion of Inter-relations of Scales

The Pearson correlation showed a significant amount of correlation among the independent variables. These results suggest that the components of the TRA, as they were measured by the instrument used for this study, were moderately inter-related. Thus, the components were contributing a large amount of common variance in the regression analysis. This could be an explanation of the statistical significance of only two of the variables in the regression. The attitude toward the behavior variable was
at least moderately correlated with the other three independent variables (−0.263, 0.602, 0.496) and, therefore, did not allow the other variables to contribute a significant amount of unique variance in the reverse regression analysis.

Pearson correlations between the three stages of behavior change (the dependent variables) were all statistically significant. The correlation coefficients ranged from 0.450 to 0.797. This suggests that the stages, as measured by the instrument used in this study, were at least substantially inter-related and did not measure unique variance.

Correlations

The behavioral beliefs component of the TRA did not have a statistically significant relationship when correlated with any of the stages of behavior change. One explanation for this may be that young adult males have a tendency to believe they are immune to the effects of many actions. Experiencing negative side-effects of using steroids may be an example of this belief. It is also possible that many of the young males who participated in this study have known or know of someone who used steroids and did not experience any side-effects, therefore, they do not believe they will occur.

Attitudes, outcome evaluations, and subjective norms were all statistically significant when correlated with each of the three stages of behavior change.
Precontemplation

The correlational values for the precontemplation stage were in the negative direction. This is due to the way the independent and dependent variables were worded and scored. For example, the more sure a respondent was that he has "never considered" using steroids (a higher score on the precontemplation scale) the stronger his feelings were that using steroids is a "bad" behavior (a score closer to one). This inverse relationship results in negative correlational values.

The $R^2$ for the full precontemplation regression model was 0.3159. One variable, attitude toward the behavior, was significant at the 0.05 level of significance for this model. It accounted for 30% of the total variance in the Precontemplation model. This indicated all of the constructs in the Theory of Reasoned Action (TRA) were not effective at predicting the Precontemplation Stage of Behavior Change. Although 31.6% of the behavior regarding steroid non-use may be explained by the components of the Theory of Reasoned Action, 30% of it was accounted for by one construct, Attitude toward the Behavior. This indicates that the other three constructs together only added 1.6%. One must keep in mind that the constructs, as measured by the instrument used in this study, are inter-related (refer to Table 21.) These results suggested that the TRA, as measured in this study, was not an acceptable predictor of intentions to initiate steroid use, as one variable accounted for essentially all of the variance. A possible explanation for this was that Precontemplators are unaware of or have not considered the factors (Prochaska, DiClemente, & Norcross; 1992) associated with steroid use. Therefore, their responses on the outcome evaluations and behavioral

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beliefs scales were not consistent, making them poor predictors. These constructs did not show significant correlation with the other variables which may also be a reason that they were not significant. A possible reason for the significance of the attitude variable is that the persons in the precontemplation stage have strong opinions about steroids and do not plan to use them in the future. It is also possible that the attitude variable did not measure a component that was different enough from the other components to allow them to add a significant amount of unique variance to the model. The instrument, while content valid, was not tested for construct validity. It is also possible that another theory may be better in this situation.

**Contemplation**

The $R^2$ for this model including all variables was 0.361. Attitudes and Outcome Evaluations accounted for 33% of the variance and were the variables significant at the 0.05 level. A possible explanation for this is that young adult males considering a behavior were still looking for the outward, immediate, or physical results of the behavior. They may have been trying to become more confident that the outcomes they were searching for would happen. A possible reason for the insignificance of the behavioral beliefs component as it was measured may be that they were feeling invincible and that the steroids could never hurt them. The subjective norms component may have appeared to be insignificant because the persons in this stage were trying to ignore peers who were against initiating steroid use, and had not yet found peers who supported it.
It is also possible that the independent variables did not measure components that were very different. This would cause one or two variables to capture all of the explained variance and not allow the others to contribute any unique variance. Again, as shown in Table 21, there was inter-relation between the constructs which also helps explain the apparent significance or insignificance of several variables.

**Preparation**

The $R^2$ for the full preparation model was 0.364. The variables that were significant at the 0.05 level were Attitude toward the Behavior and Subjective Norms. Together they accounted for 36% of the variance. Subjective norms may be significant because those who were preparing to use steroids were being persuaded to do so by people who already do use steroids. Again, the absence of two of the variables in the retained regression model may be explained by the lack of unique variance measured by the components.

**General Discussion of Regression Models**

There was one variable which was not statistically significant in any of the regression models. This was the Behavioral Beliefs component. A possible explanation for the insignificance of the behavioral beliefs may be that 18–25 year olds seem to believe they are immune to any effects from their behavior. For example, a young adult may believe that using steroids causes high blood pressure but he may not believe that using steroids will cause him to have high blood pressure. He
may believe he is invincible. It may also be that the instrument did not measure this construct adequately. It may also be that this construct was not strongly related to the other dimensions, as shown in Table 21.

There are several possible explanations of the moderate correlations and amounts of variance accounted for in this study. The first reason has to do with the quality of the instrument. While the research tool was tested for internal consistency, construct validity was not established. Some degree of measurement error due to this may help explain the unaccounted for variance in the significant models. Also related to measurement error is the apparent inter-relation of the variables. It is suggested that the scale did not really measure each independent or dependent variable separately, which affects the amount of unique variance that was accounted for by the four components. Another reason may be that some of the subjects could have lied on their questionnaires. This could cause inconsistent response patterns brought on by fear of identification since the survey was about an illegal activity. Data were self-reported and collected face-to-face rather than through the mail, which may also cause a response bias.

Demographically, this study was comparable to other studies on the topic of steroid use or non-use. This does not mean though, that the results of the present study may be generalized beyond the young adult males who work out at the gyms included in this study. The respondents in this study were volunteers, which also limits the generalizability of the findings of this research study.
CONCLUSIONS

Based on the findings of this study, it may be said that the Theory of Reasoned Action has the potential to be an acceptable predictor of steroid non-use among physically active young adult males in Central Ohio. This statement is based on two things: 1) there is no other research on this topic, and 2) results of other studies based on the TRA did no better in predicting their behaviors.

While the $R^2$ for each model in this study was significant, one variable (attitude toward the behavior) accounted for a large amount of the variance. The components of the TRA which had the highest correlations with each of the three stages of behavior change were Attitudes ($-.546, .559, .532$), Outcome Evaluations ($-.417, .443, .318$) and Subjective Norms ($-.364, .433, .607$). These were the variables which were significant in the regression models because the stronger correlational relationships generally help explain more of the variance.

These three individual components were also strong predictors in the stages in which they were significant. The attitude component accounted for 30% of the variance in the Precontemplation Stage of behavior change. Attitude and outcome evaluations accounted for 32% of the variance in the Contemplation model. Attitude and normative beliefs together accounted for 36% of the variance in the Preparation model. However, one must keep in mind that the independent variables were also correlated with each other. This did not allow each of the variables to contribute a large amount of unique significance.
It was concluded, based on the findings of this study, that the TRA may be an acceptable predictor of steroid non-use. The individual theory components were highly related as measured. This made it impossible to gauge whether or not the theory components can work together to predict a non-using stage of behavior change. It is possible that the variables did not measure components that were different enough to prevent common variance in the regression models.

The present study was a preliminary study exploring a complex behavior. More sophisticated research with better instruments and in different geographical regions should be conducted before health educators choose to accept or abandon the Theory of Reasoned Action as a possible explanation or predictor of steroid use or non-use.
IMPLICATIONS FOR PRACTICE

Although the findings from this study are preliminary, they do have some implications for Health Education practice. Any information that may help health professionals understand the factors underlying a decision to perform or not perform a given behavior provides a greater probability that they can influence that decision.

The results of this study suggested that together, the constructs of the Theory of Reasoned Action (TRA) may be useful in explaining steroid non-use in young adult males who were in the Precontemplation, Contemplation and Preparation stages of behavior change. Although the regression analysis showed the full TRA models for these stages to be significant at the 0.05 level of significance, only one variable, attitude toward the behavior, was statistically significant in each of these three models. This result suggests that the attitude variable contributes the most unique variance and may be the most important and independent component in the TRA.

Again, this instrument did not allow unique variance of each of the independent variables. The total variance accounted for in each stage of behavior was at least 30%. While this is not perfect, it is better than variance accounted for by the TRA in comparable studies regarding similar health–related behaviors. Also, the instrument used was not tested for construct validity. Doing this could help when making practical implications. It is also possible that the use of another theory may be better in this situation.
One implication for practice made from the results of this study is to design a steroid intervention that addresses a group of young adult males despite their stage of behavior change. Such an intervention would include lessons which focus on the attitudes toward the behavior component, as it was consistently significant in the regression analysis.

Another implication is that because different components were significant for different stages, it may be worthwhile to separate young adult males into stages to effectively address their steroid prevention needs.

While the variables did not appear to contribute unique variance, several suggestions for using the components of the theory are discussed here. Outcome evaluations had a significant correlation with each of the three stages of behavior change. This indicates that increasing the feeling of vulnerability of young adult males may help to encourage steroid non-use. Members of the physically active young adult male population should be made aware of the risks of steroid use as well as understanding that such dangerous side-effects could happen to them if they choose to initiate steroid use. This component was significant in the retained Contemplation regression model. This suggests that it contributed enough unique variance to be worthy of suggestion when working with young adult males in the Contemplation stage of behavior change.

The subjective norms component had statistically significant correlations with all three stages of change. It is suggested that young adult males be encouraged to explore the social norms relating to steroids and steroid use within their peer groups.
Examples of peer groups would include teammates and coaches, friends, family, and health care providers. Also recommended is a chance to explore their willingness to comply with and desire to please the people in each of the previously mentioned peer groups. Because it was significant in the retained regression model for the Preparation stage, the subjective norms component appears to be a valuable variable when trying to reach young adult males who are preparing to use steroids.

The results of this study do, to an extent, support the use of the Theory of Reasoned Action as the basis for an educational program designed to deter physically active young adult males from initiating steroid use. Keeping in mind the exploratory nature of this study, parts of it could be quite useful. There are no other theory-based studies regarding the present topic. Therefore, this study is a step toward understanding the behavior. It is recommended that this theory be used when addressing physically active young adult males regarding the topic of steroid non-use. The use of several of the components of the theory, namely attitudes toward the behavior, outcome evaluations, and subjective norms, are suggested based on the results of the present study.
RECOMMENDATIONS FOR FUTURE STUDIES

This research study only began to explore and explain the relationships between a behavior (steroid non-use) and the Theory of Reasoned Action constructs. It does, however, increase curiosity and raise many other research questions. Some of the future research possibilities concern the instrumentation, replication of the present study, level of participation in sports, and post-intervention evaluation will be discussed here.

The instrument used to gather data for this research study was not perfect. Although face and content validity were established, this instrument was not tested for construct validity. Another step for producing an effective information gathering tool is to establish test–retest reliability. It was demonstrated through correlation analysis that the independent as well as the dependent variables were highly inter-related and did not contribute unique variance to the regression analysis. Establishing a construct valid instrument is perhaps the first and most important step for research in this field to continue.

It may also be valuable for researchers to try to replicate the present study. This could be done in the same geographic area using different gyms or in various geographic regions. This type of research would let health professionals know if the results found here were unusual or if the results may be generalized across time and distance.

Educational researchers could develop and implement interventions based on the significant components and then measure to see if the intervention impacted
scores on the variables. The goal of such research would be to determine whether
behavior change occurred by emphasizing these constructs. This could be done through
pre-test, treatment, post-test studies or control group research designs.

It is recommended that research based on other theories of behavior change be
conducted. Behaviorally based reasons for steroid use or non-use is an under-
researched area of health education. Theory based research should be conducted until
steroid use and non-use can be better explained, as the personal risk factors associated
with use are fairly common, the number of users is growing, and the side-effects of
use are potentially lethal. Because steroid use or non-use is a conscious decision
made by the individual, it is a behavior that may be modified through the process of
health education, making it a worthwhile endeavor for health researchers.
SUMMARY OF CHAPTER FIVE

Although this study was demographically comparable to other steroid studies and the results were similar to research about other behaviors based on the Theory of Reasoned Action, one must not generalize the results beyond the sample and this specific behavior. The findings of this study suggest that while the components of the TRA generally accounted for a moderate amount of the variance in several of the non-steroid using stages of behavior change, health professionals should be cautious when applying the findings to practice. In the practical situation, it is suggested that the Theory of Reasoned Action may be used when addressing young adult males. Keeping in mind the correlation between the constructs, it seems that the component "Attitude toward the Behavior" is the most valuable construct in this application. More research, especially research using construct valid instruments, should be conducted before drawing any definitive conclusions regarding the application of this theory to the behavior of steroid use or non-use.
ANSWERS TO RESEARCH QUESTIONS

1. Young adult males who work out at private weightlifting gyms in Central Ohio generally feel that steroids are "quite bad". This attitude does vary some depending upon the stage of behavior change the respondent was in at the time of the survey. The attitude regarding steroids was the most negative among Precontemplators and most positive among Contemplators. Precontemplators believed the side-effects of steroids were more likely to occur than did either the Contemplators or Preparers. Possible outcomes of steroid use were viewed much more negatively by Precontemplators than by the Contemplators or Preparers.

2. The subjective norms component scores were fairly constant despite the reported stage of behavior change. No stage received a mean score greater than one on a six point scale for the subjective norms component. This suggests that none of the males who participated in this study felt they needed or wanted to use or not use steroids in order to please other important people in their lives.

3. Pearson correlations were conducted to determine the strength and direction of the relationships between the independent and dependent variables. The behavioral beliefs variable was not significantly correlated with any of the stages of behavior change. The attitude toward the behavior variable had the highest correlational values with all three stages. Outcome evaluations and subjective norms were moderately correlated with the three stages of behavior change. The Precontemplation correlations were in the negative direction while the others were in the positive direction.

4. Reverse regression models accounted for 31% to 36% of the total variance. In the Precontemplation model, one component, attitude toward the behavior, was statistically significant and accounted for 30% of the variance. The attitude toward the behavior variable combined with the outcome evaluation variable explained 33% of variance in the Contemplation model. Two variables, attitude and subjective norms, accounted for 36% of the variance in the Preparation model. Adding the statistically insignificant variables did not add much to the accounted for amount of variance in any model. This may be because each of the components were inter-related and therefore could not contribute unique variance to the models.
APPENDIX A
HUMAN SUBJECTS REVIEW APPROVAL
APPENDIX B
SAMPLE SIZE CALCULATIONS
CALCULATIONS FOR DETERMINING SAMPLE SIZE (N)

Level of Significance set at Alpha = 0.05

Desired level of power $R^2 = 0.10$

$K = 4$ (number of independent variables)

$L = 16.47$ (degrees of freedom)

$f^2 = 0.111$ (population effect size)

\[
\text{Sample Size} = \frac{L}{f^2} + k + 1
\]

\[
= \frac{16.47}{0.111} + 4 + 1 = 153 \text{ subjects}
\]

From Cohen and Cohen, 1975.
APPENDIX C
INSTRUMENT
General Instructions

In the questionnaire you are about to fill out we ask questions which make use of rating scales with six places; you are to make an "X" in the place that best describes your opinion. For example, if you were asked to rate "The Weather in Portland" on such a scale, the six places should be interpreted as follows:

The weather in Portland is

bad_____:______:______:______:______:______:good
extremely quite slightly slightly quite extremely

If you think the weather in Portland is quite bad, then you would place your "X" as follows:

The weather in Portland is

bad_____:______:______:______:______:______:good
extremely quite slightly slightly quite extremely

You will also be using a rating scale with unlikely–likely and never–always endpoints. These scales will be interpreted the same way. Please be sure to answer all items and never put more than one "X" for any item. Please place your "X" in the center of a space, not between spaces.

Section One: Please put an "X" in the space that best reflects your beliefs about steroid use.

1. Taking steroids to enhance my performance is

bad_____:______:______:______:______:______:good

2. Spending money to buy steroids is

bad_____:______:______:______:______:______:good

3. Taking steroids to enhance my appearance is

bad_____:______:______:______:______:______:good

4. Taking steroids is

bad_____:______:______:______:______:______:good
5. Purchasing steroids is
bad_____:_____:_____:_____:_____:_____:good

6. Giving myself steroid injections is
bad_____:_____:_____:_____:_____:_____:good

7. Swallowing steroid pills is
bad_____:_____:_____:_____:_____:_____:good

8. Initiating a conversation with someone about steroid use is
bad_____:_____:_____:_____:_____:_____:good

9. Approaching someone about purchasing steroids is
bad_____:_____:_____:_____:_____:_____:good

10. Learning how to use steroids correctly is
bad_____:_____:_____:_____:_____:_____:good

Section Two: Please evaluate the following statements about steroids.

unlikely_____:_____:_____:_____:_____:_____:likely
extremely quite somewhat somewhat quite extremely

11. Using steroids will get me in trouble with the law.
unlikely_____:_____:_____:_____:_____:_____:likely

12. Using steroids will cause my face to break out.
unlikely_____:_____:_____:_____:_____:_____:likely

13. Using steroids will make me stronger.
unlikely_____:_____:_____:_____:_____:_____:likely
14. Using steroids will make me more attractive.
unlikely:_____:_____:_____:_____:_____:_____:____:likely

15. If I use steroids, I will have trouble performing sexually.
unlikely:_____:_____:_____:_____:_____:_____:____:likely

16. Steroid use will help me perform better in athletics.
unlikely:_____:_____:_____:_____:_____:_____:____:likely

17. If I use steroids, I'll be more aggressive.
unlikely:_____:_____:_____:_____:_____:_____:____:likely

18. Using steroids will increase my muscle mass.
unlikely:_____:_____:_____:_____:_____:_____:____:likely

19. Using steroids will cause my blood pressure to go up.
unlikely:_____:_____:_____:_____:_____:_____:____:likely

20. Using steroids will cause me to lose hair.
unlikely:_____:_____:_____:_____:_____:_____:____:likely

21. Steroid use will increase my muscle definition.
unlikely:_____:_____:_____:_____:_____:_____:____:likely

Section Three: Indicate your personal evaluation of each of these beliefs about steroids.

bad:_____:_____:_____:_____:_____:_____:____:good
     extremely quite slightly slightly quite extremely

22. Getting in trouble with the law for steroid use is
bad:_____:_____:_____:_____:_____:_____:____:good
23. Having my face break out because of steroid use is
bad________________________:________good

24. Being stronger because of using steroids is
bad________________________:________good

25. Being more attractive due to steroid use is
bad________________________:________good

26. Having trouble performing sexually is
bad________________________:________good

27. Improvement in athletic performance due to steroid use is
bad________________________:________good

28. Being more aggressive due to steroid use is
bad________________________:________good

29. Increasing my muscle mass by using steroids is
bad________________________:________good

30. Having a higher blood pressure from using steroids is
bad________________________:________good

31. Losing hair because of steroid use is
bad________________________:________good

32. Having more muscle definition due to using steroids is
bad________________________:________good
Section Four: Please answer the following five questions as accurately as you can.

33. I am ___ years old.

34. My annual income is about $________ (please approximate to the nearest thousand).

35. I work out at this gym ____ times per week.

36. I have been lifting weights regularly for _____ months.

37. I have participated in the following athletic events in an organized team or competition: (You may circle more than one)
   1. baseball
   2. football
   3. tennis
   4. wrestling
   5. basketball
   6. track and field
   7. volleyball
   8. softball
   9. swimming
   10. soccer
   11. power-lifting
   12. body-building
   13. Other (please specify) ____________________
   14. I have not participated in organized athletics

38. My racial background is best described as:
   1. African-American
   2. Asian
   3. Caucasian
   4. Hispanic
   5. American Indian
   6. Other (please specify) ____________________.
Section Five: Please put an "X" on the line that you feel best describes the feelings of the following people.

unlikely _____:_____:_____:_____:_____likely
      extremely quite some some quite extremely

39. My friends at the gym think I should use steroids.
unlikely_____:_____:_____:_____:_____likely

40. My friends outside the gym think I should use steroids.
unlikely_____:_____:_____:_____:_____likely

41. My family thinks I should use steroids.
unlikely_____:_____:_____:_____:_____likely

42. My dating partner(s) thinks I should use steroids.
unlikely_____:_____:_____:_____:_____likely

43. People I am interested in sexually think I should use steroids.
unlikely_____:_____:_____:_____:_____likely

44. Health care professionals think I should use steroids.
unlikely_____:_____:_____:_____:_____likely

45. People who are important to me think I should use steroids.
unlikely_____:_____:_____:_____:_____likely
Section Six: Please put an "X" on the line that best describes your feelings about each statement.

never______:_______:_______:_______:_______:_______:_______:always
  absolutely almost somewhat somewhat almost absolutely

46. I try to do what pleases my friends at the gym.
never______:_______:_______:_______:_______:_______:_______:always

47. I try to do what pleases my friends outside the gym.
never______:_______:_______:_______:_______:_______:_______:always

48. I try to do what pleases my family.
never______:_______:_______:_______:_______:_______:_______:always

49. I try to do what my dating partner(s) thinks I should do.
never______:_______:_______:_______:_______:_______:_______:always

50. I try to do what pleases people I'm interested in sexually.
never______:_______:_______:_______:_______:_______:_______:always

51. I try to do what health care professionals think I should do.
never______:_______:_______:_______:_______:_______:_______:always

52. I try to do what pleases people who are important to me.
never______:_______:_______:_______:_______:_______:_______:always
Section Seven: Please use the following key to express the degree to which you disagree or agree with the next sixteen statements.

1 = Strongly disagree
2 = Disagree
3 = Slightly disagree
4 = Slightly agree
5 = Agree
6 = Strongly agree

Disagree --> Agree
/
\ 1 2 3 4 5 6

53. I have never considered using steroids.
54. I have never considered discussing steroid use with friends.
55. I have never considered contacting someone who supplies steroids.
56. I have never considered purchasing steroids.
57. I have considered using steroids.
58. I have considered saving money to buy steroids.
59. I have considered talking to a steroid user about using steroids myself.
60. I have considered contacting someone who supplies steroids.
61. I am in the process of saving money so I can buy steroids.
62. I am in the process of talking with someone about which steroid to use.
63. I am actively looking for a contact/ supplier of steroids.
64. I devote some of my income to buy steroids.  

65. I have a supplier/source of steroids.  

66. I currently am using steroids.  

67. I used steroids in the past but no longer do so.  

68. I am currently between steroid cycles.  

If you have any questions or comments about steroids, steroid use, or this survey please feel free to use the space below.  

Thank you!!!
APPENDIX D

EXPERT REVIEW FORMS
Dear Professor:

I am currently in the process of ascertaining the face and content validity of a survey instrument I plan to use for collecting data for my masters thesis. The title of my thesis is "Using the Theory of Reasoned Action to Predict the Precontemplation, Contemplation, and Preparation Stages of Behavior Change Regarding the Intentions of Young Adult Males to Initiate Steroid Use." I would greatly appreciate you serving on my panel of experts to help determine the face and content validity of my instrument.

The questionnaire will be administered to young adult males, between the ages of 18 and 25, who work out in several gyms in Central Ohio. The purpose of this study is to measure the attitudes, behavioral beliefs, outcome evaluations, knowledge, normative beliefs, motivation to comply, and intentions of these young males as related to steroid use. This type of baseline information may be used to plan relevant and effective steroid use prevention programs.

The following form has been developed for your use in commenting on the items I have developed for the questionnaire. As you review the proposed items, please feel free to comment on the following topics:

Face Validity- Does the instrument "look like" it is measuring what it is supposed to measure?
Content Validity- Are the items representative of concepts related to the Theory of Reasoned Action and young adult steroid use?
Clarity- Is each item clear? Is the language level appropriate for the audience (males at a 10th grade reading level)?
Format- Logical flow?
Other- Please make any suggestions as warranted. Space is provided for comments for each question.

If possible, please return the enclosed expert form with your comments to me by March 7, 1994. If you have any questions or are unable to review the instrument, please contact me at 292-6116. Thank you in advance for your help.

Sincerely,

Julia C. Lashley
Graduate Student
Dept. of Health Education
**Scale One (Beliefs)**

This scale is scored using a 6-point semantic differential with **Bad** and **Good** as the bipolar adjectives.

1. Taking steroids to enhance my performance is  | YES | NO | YES | NO |
2. Spending money to buy steroids is  | YES | NO | YES | NO |
3. Putting synthetic steroids into my body is  | YES | NO | YES | NO |
4. Taking illegal steroids is  | YES | NO | YES | NO |
5. Purchasing steroids is  | YES | NO | YES | NO |
6. Giving myself injections is  | YES | NO | YES | NO |
7. Swallowing pills is  | YES | NO | YES | NO |
<table>
<thead>
<tr>
<th>CONTENT VALID? CLEAR?</th>
</tr>
</thead>
<tbody>
<tr>
<td>8. Initiating a conversation with someone about steroid use is</td>
</tr>
<tr>
<td>9. Approaching someone about purchasing steroids is</td>
</tr>
<tr>
<td>10. Learning how to use steroids is</td>
</tr>
</tbody>
</table>

**Scale Two (Behavioral Beliefs)**

This scale is scored using a 6-point semantic differential using *Unlikely* and *Likely* as the bipolar adjectives.

<p>| 11. Using steroids will get me in trouble with the law. | YES NO YES NO |
| 12. Using steroids will cause my face to break out. | YES NO YES NO |
| 13. Using steroids will make me stronger. | YES NO YES NO |
| 14. Using steroids will make me more attractive. | YES NO YES NO |</p>
<table>
<thead>
<tr>
<th></th>
<th>CONTENT VALID?</th>
<th>CLEAR?</th>
</tr>
</thead>
<tbody>
<tr>
<td>15. If I use steroids, I will have trouble performing sexually.</td>
<td>YES NO YES NO</td>
<td></td>
</tr>
<tr>
<td>16. Steroid use will help me perform better in athletics.</td>
<td>YES NO YES NO</td>
<td></td>
</tr>
<tr>
<td>17. If I use steroids, I'll be more aggressive.</td>
<td>YES NO YES NO</td>
<td></td>
</tr>
<tr>
<td>18. Using steroids will increase my muscle mass.</td>
<td>YES NO YES NO</td>
<td></td>
</tr>
<tr>
<td>19. Using steroids will cause my blood pressure to go up.</td>
<td>YES NO YES NO</td>
<td></td>
</tr>
<tr>
<td>20. Using steroids will cause me to lose hair.</td>
<td>YES NO YES NO</td>
<td></td>
</tr>
<tr>
<td>21. Steroid use will increase my muscle definition.</td>
<td>YES NO YES NO</td>
<td></td>
</tr>
</tbody>
</table>
Scale Three (Outcome Evaluations)
This scale is scored on a 6-point semantic differential using Bad and Good as the bipolar adjectives.

<table>
<thead>
<tr>
<th>Item</th>
<th>CONTENT VALID?</th>
<th>CLEAR?</th>
</tr>
</thead>
<tbody>
<tr>
<td>22. Getting in trouble with the law for steroid use is</td>
<td>YES</td>
<td>NO</td>
</tr>
<tr>
<td>23. Having acne from steroid use is</td>
<td>YES</td>
<td>NO</td>
</tr>
<tr>
<td>24. Being stronger because of steroid use is</td>
<td>YES</td>
<td>NO</td>
</tr>
<tr>
<td>25. Being more attractive due to steroid use is</td>
<td>YES</td>
<td>NO</td>
</tr>
<tr>
<td>26. Having trouble performing sexually is</td>
<td>YES</td>
<td>NO</td>
</tr>
<tr>
<td>27. Performing better in athletics because of steroid use is</td>
<td>YES</td>
<td>NO</td>
</tr>
<tr>
<td>28. Being more aggressive due to steroid use is</td>
<td>YES</td>
<td>NO</td>
</tr>
</tbody>
</table>
29. Increasing muscle mass by using steroids is

30. Having a higher blood pressure from using steroids is

31. Losing hair because of steroid use is

32. Having more muscle definition due to using steroids is

Scale Four (Knowledge)
One of four responses is correct for each of the knowledge items.

33. Which of the following is the safest way to use steroids?

34. Which of the following is a direct result of using steroids?

35. When used by adolescents, steroids can produce which of the following symptoms?
36. Which of the following has been associated with long-term use of steroids?  

-------

37. Which of the following is true?  

-------

38. Which of the following is false?  

-------

Scale Five (Demographics)
Respondents are asked to answer the following questions as accurately as possible.

39. I am ___ years old.  

-------

40. My annual income is about $______ (please approximate to the nearest thousand).  

-------

41. I work out at this gym ___ times per week.  

-------

42. I have participated in the following athletic events in an organized team or competition. (14 options are listed)  

-------
**Scale Six (Normative Beliefs)**
This scale is scored using a 6-point semantic differential with **Unlikely** and **Likely** as the bipolar adjectives.

<table>
<thead>
<tr>
<th>CONTENT VALID?</th>
<th>CLEAR?</th>
</tr>
</thead>
<tbody>
<tr>
<td>YES</td>
<td>NO</td>
</tr>
<tr>
<td>-----------------</td>
<td></td>
</tr>
<tr>
<td>43. My friends at the gym think I should use steroids.</td>
<td></td>
</tr>
<tr>
<td>YES</td>
<td>NO</td>
</tr>
<tr>
<td>-----------------</td>
<td></td>
</tr>
<tr>
<td>44. My coach/trainer thinks I should use steroids.</td>
<td></td>
</tr>
<tr>
<td>YES</td>
<td>NO</td>
</tr>
<tr>
<td>-----------------</td>
<td></td>
</tr>
<tr>
<td>45. My friends at home think I should use steroids.</td>
<td></td>
</tr>
<tr>
<td>YES</td>
<td>NO</td>
</tr>
<tr>
<td>-----------------</td>
<td></td>
</tr>
<tr>
<td>46. My parents think I should use steroids.</td>
<td></td>
</tr>
<tr>
<td>YES</td>
<td>NO</td>
</tr>
<tr>
<td>-----------------</td>
<td></td>
</tr>
<tr>
<td>47. My dating partner(s) thinks I should use steroids.</td>
<td></td>
</tr>
<tr>
<td>YES</td>
<td>NO</td>
</tr>
<tr>
<td>-----------------</td>
<td></td>
</tr>
<tr>
<td>48. People I am interested in sexually think I should use steroids.</td>
<td></td>
</tr>
<tr>
<td>YES</td>
<td>NO</td>
</tr>
<tr>
<td>-----------------</td>
<td></td>
</tr>
<tr>
<td>49. Health care professionals think I should use steroids.</td>
<td></td>
</tr>
<tr>
<td>YES</td>
<td>NO</td>
</tr>
<tr>
<td>-----------------</td>
<td></td>
</tr>
</tbody>
</table>
50. People who are important to me think I should use steroids.  
                                 YES  NO  YES  NO
                                 ________________
                                 ________________

Scale Seven (Motivation to Comply)
This scale is scored using a 6-point semantic differential using Never and Always as the bipolar adjectives.

                                 CONTENT VALID?  CLEAR?
                                 YES  NO  YES  NO
                                 ________________
                                 ________________
51. I try to do what pleases my friends at the gym.  
                                 YES  NO  YES  NO
                                 ________________
                                 ________________
52. I try to do what pleases my coach/trainer.  
                                 YES  NO  YES  NO
                                 ________________
                                 ________________
53. I try to do what my friends at home think I should do.  
                                 YES  NO  YES  NO
                                 ________________
                                 ________________
54. I try to do what pleases my parents.  
                                 YES  NO  YES  NO
                                 ________________
                                 ________________
55. I try to do what my dating partner thinks I should do.  
                                 YES  NO  YES  NO
                                 ________________
                                 ________________
56. I try to do what pleases people I'm interested in sexually.  
                                 YES  NO  YES  NO
                                 ________________
                                 ________________
57. I try to do what health care professionals think I should do.  

58. I try to do what pleases people who are important to me.

Scale Eight (Intentions)
This scale is scored using a 6-point Likert scale to which the respondent answers disagrees strongly through agrees strongly.

CONTENT VALID?  CLEAR?

59. I have never considered using steroids.

60. I have never considered discussing steroid use with friends.

61. I have never considered contacting someone who supplies steroids.

62. I have never considered purchasing steroids.

63. I have never considered entering weightlifting or bodybuilding competitions.

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64. I have considered using steroids.

65. I have considered saving money to buy steroids.

66. I have considered talking to a steroid user about using steroids myself.

67. I have considered contacting someone who supplies steroids.

68. I have considered entering weightlifting or bodybuilding competitions.

69. I am in the process of saving money to buy steroids.

70. I am in the process of talking to someone about which steroid would be best for me to use.

71. I am preparing to enter a weightlifting or bodybuilding competition.

CONTENT VALID? CLEAR?

YES NO YES NO

YES NO YES NO

YES NO YES NO

YES NO YES NO

YES NO YES NO

YES NO YES NO

YES NO YES NO

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72. I am actively looking for a contact/supplier of steroids. YES NO YES NO

73. I devote some of my income to buying steroids. YES NO YES NO

74. I have a supplier/source of steroids. YES NO YES NO

75. I currently am using steroids. YES NO YES NO

76. I got caught using steroids, so I quit. YES NO YES NO

77. Due to the side-effects of steroids I quit using them. YES NO YES NO

78. I used steroids in the past but no longer do so. YES NO YES NO

79. I am currently between cycles. YES NO YES NO

CONTENT VALID? CLEAR?

135
CODEBOOK

This codebook was used when entering information gathered using the "Steroids Questionnaire".

If there was no answer recorded on the questionnaire, record the missing data using a dot (.)

For items #1–#10, enter the following values:
- extremely bad = 1
- quite bad = 2
- slightly bad = 3
- slightly good = 4
- quite good = 5
- extremely good = 6

For items #11–#21, enter the following values:
- extremely unlikely = 1
- quite unlikely = 2
- somewhat unlikely = 3
- somewhat likely = 4
- quite likely = 5
- extremely likely = 6

For items #22–#32, enter the following values:
- extremely bad = 1
- quite bad = 2
- slightly bad = 3
- slightly good = 4
- quite good = 5
- extremely good = 6

For item #33, enter the two digit age value.

For item #34, enter the five digit income value.
    If reported "student", enter 00000.

For item #35, enter the one digit frequency value.

For item #36, enter the two digit duration value.
For item #37, enter a "1" if the sport is not circled.
Enter a "2" if the sport is circled.

For item #38, enter the following values:
  African-American = 1
  Hispanic = 2
  Caucasian = 3
  Asian = 4
  Other = 5

For items #39–45, enter the following values:
  extremely unlikely = 1
  quite unlikely = 2
  slightly unlikely = 3
  slightly likely = 4
  quite likely = 5
  extremely likely = 6

For items #46–52, enter the following values:
  absolutely never = 1
  almost never = 2
  somewhat never = 3
  somewhat always = 4
  almost always = 5
  absolutely always = 6

For items #53–68, enter the value of the number circled.
  strongly disagree = 1
  somewhat disagree = 2
  slightly disagree = 3
  slightly agree = 4
  somewhat agree = 5
  strongly agree = 6
APPENDIX F

SUMMARY OF ORAL INSTRUCTIONS
SUMMARY OF ORAL INSTRUCTIONS

Hi. My name is Julie and I'm working with the Department of Health Education at The Ohio State University. I am asking you to participate in a study of beliefs surrounding steroid use among 18–25 year old males. Are you between these ages? If you are between these ages, we want to know what your attitudes and beliefs are.

To participate in the study, you need to fill out a written questionnaire that takes about 20 minutes to complete. You are not asked to put your name on the survey instrument and there are no other identifying questions. You have our promise that your answers will be anonymous and your participation will be kept confidential. Participation in this project is voluntary.

If you agree to take part, you must sign this consent form and then hand it to me. There is no way to link a consent form to a completed survey.

On the survey, there are 68 statements regarding steroids and steroid use. Please answer each as accurately and honestly as possible. There are no right or wrong answers. When you are finished, please put the survey in this envelope, seal it, and then drop it in this box. Feel free to keep the pencil. Please do not discuss this survey with anyone else in the gym. That's it! Thank you!
APPENDIX G

COVER LETTER
Dear Respondent:

The Department of Health Promotion and Education at The Ohio State University is conducting a survey to determine what males in Central Ohio think and feel about steroids and steroid use.

Enclosed is a questionnaire. The questions are easy to answer and should not take more than 20 minutes of your time. You have our assurance that the information you provide in this survey will be kept anonymous. You are not asked to put your name on any part of this questionnaire and the names of participating gyms will not be listed anywhere in the research or results. All data will be presented as group data only; no individual responses will be used.

Your participation is important to the success of this research project. Please complete the following four steps.

1. Fill out the questionnaire.
2. Put the questionnaire in the accompanying envelope.
3. Seal the envelope.
4. Drop the envelope in the box at the front desk.

If you have any questions about this survey or want a copy of the results, please call Julia at 292-6116. Thank you for your time and attention.

Sincerely,

Julia C. Lashley
Graduate Student
Health Promotion & Education

Kathleen M. Lux, RN, PhD, CHES
Assistant Professor
Health Promotion & Education

Program Areas

Adapted Physical Activity
341 Larkins Hall
292-6226

Exercise Science
129 Larkins Hall
292-6887

Health Education
215 Pomerene Hall
292-6116

Sport, Leisure & Somatic Studies
246 Larkins Hall
292-6538

Teacher Education
305A Pomerene Hall
292-5679

College of Education
APPENDIX H

CONSENT FORM
CONSENT FOR PARTICIPATION
IN SOCIAL AND BEHAVIORAL RESEARCH

I consent to being in a research study conducted through the Department of Health Promotion and Education at The Ohio State University.

Julia Lashley has told me the following:

- the purpose of the study,
- the procedures to be followed,
- the confidentiality of information,
- and the expected duration of participation.

I acknowledge that I have had the opportunity to obtain additional information regarding the study and that any questions I have raised have been answered to my full satisfaction. Further, I understand that I am free to withdraw consent at any time and to discontinue participation in the study without prejudice to me.

Finally, I acknowledge that I have read and fully understand the consent form. I sign it freely and voluntarily.

Date: __________  Signed: ____________________________
            Participant

Signed: ____________________________
            Investigator

Signed: ____________________________
            Principal Investigator

PROGRAM AREAS

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LIST OF REFERENCES


