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Body Image Distortion, Athletic Participation and Steroid Use by High School Students in Southwestern Ontario

by

Michael Sean O'Neil

B.H.K., University of Windsor, 1990

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ABSTRACT

This study was designed to explore the degree of use of anabolic steroids by high school students in Southwestern Ontario, Canada. The findings of this study contribute to the somewhat limited literature detailing the use of steroids by high school students in Canada and the U.S.A.. Researchers have suggested that there is a significant percentage of high school students using anabolic steroids, 6% to 19% (McFarland,1991), with males reporting more than two times the use of females (Terney and McLain,1990). Also, athletes and nonathletes have reported steroid use, with athletes reporting significantly more use than nonathletes (Anderson, Albect, McKeag, Hough, and McGrew,1991; Terney and McLain,1990; and Windsor and Demetru,1989).

Students have been reported to use steroids to improve their athletic performances and appearance (Terney and Mclain,1990; Chung and Moore,1990; Krowchuk, Anglin, Goodfellow, Stancin, Williams, and Zimel,1989; Addition Research Foundation,1989-91) while ignoring the negative side effects associated with steroid use (Struass,1987; and White, Richardson, Grosshans, Perkins, and Murdock,1987). The use of steroids by high school students still continues (McFarland,1991, Terney and McLain,1990) and there is a need to educate students concerning the drastic side effects of steroid use. (McFarland,1991 and White et al.,1987).

The subjects of this study were 440 (253 male and 187 female) high school students from grade 9 through to grade 13. Within the population students, 251 were athletes and 141 were not. The ratio of potential - actual steroid use between males and females was almost 2 to 1. Also, male athletes reported significantly more potential - actual steroid use than any other group of students. Students reported potential - actual use of steroids for both improving their appearance and sports performance enhancement, although the appearance motive was reported more frequently.

Multivariate analyses were used to identify specific correlates of steroid use among the high school students. Results are discussed in terms of health ramifications for the users. Recommendations are made for the early identification of 'at risk' students and possible ways of preventing abuse of anabolic steroids in high schools.

I would like to dedicate this thesis to

Anne E. O'Neil

Acknowledgement

I would like to extend my sincere appreciation to my committee members. Many thanks to Dr. Dick Moriarty and Dr. Wendy Rodgers for their continual support, encouragement and friendship throughout this study. Thanks to Dr. Cheryl Thomas and John Zarebski for their direction and expertise during the thesis writing process.

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CHAPTER I

INTRODUCTION

Background

One event that has shaped knowledge and research regarding steroid use was when Ben Johnson was stripped of a Gold medal at the 1988 Summer Olympic Games in Seoul,Korea. Johnson's medal was revoked because he tested positive for steroids [stanozolol] following his record breaking time in the 100 meter dash (Spence,1988-89,p.E1). As a result of the positive drug test, the Canadian government created The Commission of Inquiry into the Use of Drugs and Banned Practices Intended to Increase Athletic Performance : The Dubin Inquiry (Dubin,1990). The Dubin Inquiry provided a report that included 14,617 transcript pages, 122 witnesses, 48 admitted steroid users, 295 pieces of evidence, 91 days of public sessions, all at a cost of $ 3.7 million dollars (Moriarty, Fairall, and Galasso, 1992).

Evidence collected at the Dubin Inquiry clearly demonstrated the use of anabolic steroids by Canada's 'elite' athletes. As the Inquiry progressed, it became evident that anabolic steroid use was not limited to elite athletes, but extended to students who sought to improve their appearance, as well as their athletic performance (Dubin,1990). Several authors have reported on the use of anabolic steroids by high school students (Anderson, Albert,

McKeag, Hough and McGrew,1991; Terney and McLain,1990; Johnson, Jay, Shoup, and Rickert,1989; Buckley, Yeasalis, Friedl, Anderson, Streit and Wright,1988; Duda,1988; and White, Richardson, Grosshans, Perkins and Murdock,1987).

The press has devoted many of its editorials to steroids. The USA Today 1988-89 'Special Steroid Report' is one example of the increased coverage by the press (Terney and McLain, 1990). One of the most noted news accounts was of the Ben Johnson scandal at the Summer Olympic Games (Spence,1988-89,p.E1).

Another story about 'The Death of An Athlete' in Sports Illustrated (Telander and Noden,1989,p.68-78) documented the story of a high school football player who took steroids. The authors noted, "Benji Ramirez took steroids to 'get big'. They helped make him a football starter. They may have killed him" (Telander and Noden,1989,p.69). An autopsy performed on Ramirez's body revealed that he died of a cardiac arrhythmia caused by a diseased and enlarged heart (Telander and Noden,1989). "It is the strong opinion of County Corner Dr. Robert A. Malenowski that use of anabolic steroids did in some way contribute to the death of Benjamin Ramirez" (Telander and Noden,1989,p.71).

Physiology of Steroids

Johnson et al. (1989) defined anabolic steroids as derivatives of the male hormone, testosterone. Testosterone is present in both males and females. Production of

testosterone depends upon stimulation by the luteinizing hormone of the anterior pituitary gland, and it is secreted by the Leydig cells of the testes" (White et al.,1987,p.32). Ovaries also secrete testosterone in the female but at much lower concentrations (White et al.,1987,p.32).

Anabolic Steroid Use

Following World War II, physicians used anabolic steroids to speed recovery from starvation and major surgery (Strauss,1987,p.59). A hypothesis was presented in the 1950's suggesting that "if anabolic-androgenic steroids helped the debilitated return to normal, the steroids might be beneficial to healthy individuals" (White et al.,1987,p.32). Inevitably, athletes began using anabolic steroids in the 1950's. Usage has increased through the years, despite possible adverse reactions and bans on steroids by sport governing bodies (McFarland,1991; American College of Sports Medicine [ACSM], 1984).

With the use of steroids by athletes another population began to succumb to the lure of these drugs, namely, nonathletes. The ACSM (1984) listed one characteristic of steroids that appeals to the non athlete population: "Anabolic-androgenic steroids in the presence of an adequate diet can contribute to increase body weight, often in the lean mass department" (ACSM, 1984, p.534). In a recent study, steroid use was reported by students seeking to

improve their physical appearance or what one may term 'cosmetic reasons' (Terney and McLain,1990; and Shuster,1988-89). Over six percent of male high school seniors in the U.S.A. were reported to have used anabolic steroids (Shuster,1988-89). Terney and McLain (1990) reported 2.4% of the non athletic high school population in the U.S.A. (2,113 total population athletes and nonathletes) were users of anabolic steroids.

Individuals have continued to use anabolic steroids to enhance athletic performance in 'win-at-all-cost' competition and to enhance appearance (McFarland,1991). Reports ranging from the Ben Johnson scandal (Dubin,1990; and Spence,1988-89) to high school football (Telander and Noden,1989) have highlighted the use of steroids by the athletic population. In a recent article, "Bulking Up and Bombing out", McFarland (1991) described the use of steroids by males and females to obtain the perfect physique.

> The dudes and damsels all 'want to look fantastic at the beach.' And they want a shortcut. Why work out for years, when a few months of pills and shots can create the 'body beautiful' (McFarland,1991,p.12).

Two areas of steroid use by high school students have been explored to date. First, steroid use to enhance athletic performance, and second, use for cosmetic purposes. Literature pertaining to the use of steroids by students indicates that it is a predominantly male phenomenon and predicated on improving athletic performances and physical

appearance (McFarland,1991; Terney and McLain,1990; Chung and Moore,1990; Knowchuk, Anglin, Goodfellow, Stancin, Williams, and Zimel,1989; and Addition Research Foundation [ARF],1989-91). Since athletic and cosmetic reasons are the stimulus behind steroid use, then both should be investigated.

Sociocultural attitudes and the ideal of masculinity has created a new 'man' in today's society. Researchers have found that males perceive themselves to be under weight (Ford,1991) and have expressed the desire to gain body mass to look more mesomorphic, (Chung and Moore,1990; Loosemore and Moriarty,1990; Mintz and Betz,1986; and Fallon and Rozin,1985) which males believe is most attractive to females (Chung and Moore, 1990). Studies have shown that male adolescents share the same views as their adult counterparts (Giarranto,1991; Cohn, Adler, Irwin, Millstein, Kegeles, and Stone,1987; and Duncan, Ritter, Durnbush, Gross, and Carlsmith,1985). Tobin-Richards, Boxer and Peterson (1983), and Lerner and Korn (1972), reported that males held a predominantly favourable view of the mesomorphic body-build and expressed a desire to gain weight. This type of body bias can lead to body image disturbance, dissatisfaction, and distortion which is referred to as BODY IMAGE DISTORTION (BID).

Unlike females who wish to be thinner, males have expressed a desire to gain weight since they underestimate

or perceive themselves to be a smaller build then they actually are (Ford,1991; Keith,1991; Cohn et al.,1987; Duncan et al.,1985; and Lerner and Korn,1972). This can lead to steroid use. Females who had unrealistic or disturbed body images generally overestimated their body size and many lapse into the realm of eating disorders like anorexia and bulimia (Ford,1990, Mintz and Bentz,1986).

Rosen and Gross (1987), studied 1,373 (698 males/765 females) high school children. The study indicated that females (65%) and males (16.2%) had been on a weight reducing regime; compared to 9.1% of the girls and 28.4% of the boys who were trying to gain weight. Giarranto (1991), Tobin-Richards et al. (1983), and Lerner and Korn (1972) found that male adolescents view themselves and perceived that females also viewed them as being under weight, and wished to gain weight to obtain the mesomorphic build.

If males wish to gain weight as a result of body image distortion (BID), one course of action would be the use of steroids. Salva and Bacon (1989), noted in their research on potential users that "12% of the adolescents inquiring about anabolic steroids being asthenic or having a poor self-image" (p.940). Rosen and Gross (1987), reported exercise as the primary method employed by male adolescents to gain or lose weight. Steroids may be used because research has suggested that steroids with exercise will increase muscle mass and develop a leaner body mass

(Phillips,1989; Haupt and Rovere,1984; and Office for Substance Abuse Prevention [OSAP],1979). Some male adolescents may be prompted to fulfil their desires for a mesomorphic body-build by turning to steroid use. The testimonies at the Dubin Inquiry revealed many incidents where athletes and nonathletes used steroids, "but perhaps the most worrisome steroid-related news of recent years is the fact that steroid use is growing rapidly among high-school students" (McFarland,1991,p.12). This suspected dangerous trend prompted the present study, which investigates the use, potential use, and nonuse of steroids in Southwestern Ontario high schools.

Review of Literature

In the 1930's androgens were first used clinically to build and maintain strength in aging men who were thought to have low androgen levels (White et al.,1987). During World War II German soldiers were given steroids to increase their aggression (McFarland,1991; Strauss,1987; and White et al.,1987). This use of steroids on soldiers marked the first nonclinical use of steroids.

By the 1950's athletes began using steroids. Anabolic steroid use has increased through the years, despite the possible adverse reaction and banning of steroids by sport governing bodies (ACSM,1984). Steroid use had not only infiltrated the athletic population in the 1950's, but entered the population of nonathletes who also recognized

the benefits of these drugs while ignoring the dangerous, sometimes fatal side effects (c.f. White et al.,1987).

Steroid use continued through the decades and numerous reports surfaced about steroid use by individuals seeking to enhance their athletic performance or to enhance their appearance (McFarland,1991). Haupt and Rovere (1984) noted, that anabolic steroids will improve an individuals utilization of ingested protein and will enable a steroid user to "induce protein syntheses in the skeletal muscle cell" (p.475). The "anabolic effect continues indefinitely during steroid treatment and occurs in both the healthy and the catabolic state"(Haupt and Rovere,1984,p.474). Knuth, Maniera and Nieschug (1989), Herbert and Rovere (1984) research reported, a 'placebo effect' may be experienced by those who thought they were getting steroids, providing psychological motivation for individuals "...to increase their strength over what would have been expected in the absence of anabolic steroids" (Haupt and Rovere,1984,p.474).

High School Students

The Dubin Inquiry initially was prompted by the use of steroids by Canada's 'elite' athletes. As the testimonies continued the use of steroids was not only limited to our countries 'best', but also reached the ranks of high school students. Testimonies also made it evident that the nonathlete population was using steroids to improve their appearance (Dubin,1990).

Several studies conducted in recent years have shown that there is a significant percentage of the high school student population using anabolic steroids. The largest percentage is reported in a current article in Listen, written by Ken McFarland (April,1991). McFarland (1991) reported that from 6 % to 19% of teenagers are using steroids. Within the range recorded, male users of steroids out numbered females four to one. The use of steroids by students was prompted by two variables, 1) individuals sought to enhance their athletic performance or 2) to enhance their appearance, using steroids as a short cut.

Krowchuk et al. (1989), reported on the use of erogenic aids by high school athletes. The researchers had 295 subjects who participated in the study; 1.4% stated that they had taken steroids. Males (81%) were significantly more likely than females (49%) to have heard of steroids as a performance aid. Males (32%) believed anabolic steroids were effective in performance enhancement, compared to the females (13%) and 14% of the males versus 0% of the females would consider using steroids or were potential users. The authors, also attempted to explore the potential use of illicit drugs like steroids to the following variables: age, sex, sport played (football vs. non football), classification of sport played (contact, limited contact, non contact), and level of sports competition (varsity, junior varsity, freshman). "There were no consistent

associations between subjects' responses and classification of sport played, even when controlled for gender" (Krowchuk et al,1989,p.488).

In The Physician and Sportsmedicine (Duda,1988), an article titled "Gauging steroid use in high school" reported that 12% of the head football coaches surveyed in Michigan high schools estimated that at least one player on their squad used steroids. In class A schools (1,200 students or more) 21% of the coaches said at least one player used steroids, while in class D schools (298 or fewer) only 4% had a player who used steroids. Twenty-five percent of suburban school coaches and six percent of rural coaches reported steroid use by players.

Anderson et al. (1991) study, published in The Physician and Sportsmedicine, surveyed 2,282 college athletes in the NCAA. The study sample consisted of 1,552 male and 730 female subjects. The findings of this study were compared to a similar study conducted in 1985 by Anderson and McKeag. Steroid use had increased slightly over the years, by a margin of 1% . Anderson and McKeag (1985) also described steroids as male gender specific drugs. It was noted that college athletes had their first experience with alcohol and other drugs while in junior or senior high school. Of the current users identified, 4% had used steroids in junior high and 21% in high school. The data gathered by the researchers did not support evidence of

an anabolic steroid epidemic in 1991 when compared to the 1985 study.

In the Journal of Diseases of Children (1990), Terney and McLain reported on a survey of 2,113 students in Chicago. The authors believed their study was the first report detailing the actual incidence of steroid use in this population. A review of literature confirms the author's suspicions. With a 29 item questionnaire developed by the researchers, students reported that 4.4% had used steroids (6.6% of the males and 2.5% of females were users). Steroids were used by 5.5% of athletes and 2.4% by nonathletes. Females in Grade 9 (n=10) had a higher user rate than females in Grade 12 (n=5). Participants in weight related sports had the highest incidence of steroid use (e.g. Wresting 12.2% and football 9.3%). Surprising to the researchers, badminton players had a user rate of 7.8%. In the population surveyed, 15% of students revealed that they knew someone who used steroids.

Sources of steroid information were classified into four categories: friends (43%), physicians (31%), others (24%), and coaches (23%). The sources of steroid information were mostly dominated by television followed by friends, others, 'muscle' magazines, and lastly doctors. The perceptions of subjects who believed steroids improved their strength and/or speed was 54%. Extrapolated to the U.S. national population of high school students, the

steroid users (4.4% N=2,113) in this study would infer that approximately 700,000 high school students across America use anabolic steroids.

Medicine and Science in Sport and Exercise, contained a study conducted by Windsor and Demetru (1989), titled "Prevalence of Anabolic Steroid Use By Male and Female Adolescents". The researchers grouped surveys of subjects into 2 Groups. Group I had 510 surveys sent out with a 92.4% response rate and Group II had 500 surveys distributed with an 86% response rate. Of all students surveyed (N=1,010), 3% had used steroids (5.0% of males and 1.4% of females). Group I athletes who used anabolic steroids were 5.9% compared to 1.5% of the athletes in Group II who admitted the use of these drugs. Anabolic steroid use by males in Group I was 10.2% and only 2.8% of Group II. Female body builders and female power lifters may have contributed to the female subpopulation of anabolic steroid use. The primary source of steroids was the black market (85.2%), followed by physicians (74%) for those respondents who acknowledged personal steroid use. Males and females of both Groups reported that they knew of others who used steroids. Approximately, 28.1% of males and 22.1% of females knew of at least one person who used anabolic steroids.

Also reported was the fact that the most frequently used injectable steroid was testosterone, followed by

nandralone decanoate (Deca-Darabolin). Methandrostenole (Dianabol) followed by oxymentholane (Anadol) were the two most frequently used oral steroids. Of all the athletes who participated in the study (299 males and 297 female) 11 out of 25 steroid users were football players and 6 out of 25 steroid users were bodybuilders. Males who consumed steroids ranged from 15 to 19 years of age and females from 15 to 16 years of age, while the medium age of steroid users was 16 years in Group 1 and 17 in Group II.

Thus far the review of literature has only reported on steroid use by high school students in the U.S. . The ARF (1989-91) published findings of students in the Toronto, Ontario area. This article was the only Canadian study that reported on steroid use by Canadian students found in a review of published literature. The students were clustered into ages 13 years or less, 14 - 17 and 18 years or more. Steroid use by students was reported at 1.1%. Students that participated in bodybuilding and weight lifting showed a higher rate of use (2.1%). The males (2.1%) used more steroids than the females (.2%) surveyed. Grade related steroid use was as follows: Grade 7 =.5%, Grade 9 =1.2%, Grade 11 =1.6% and Grade 13 =1.3% . An age analysis revealed that students 13 years or under had a user rate of .3%, 14-15 years =1.4%, 16-17 years =1.4% and 18 years or more had a user rate of 1.6% .

Body Image Distortion (BID) and Male/Female Adolescence

Studies conducted in recent years attempted to explore male and female adolescents dissatisfaction with their bodies. Loosemore and Moriarty (1990), noted that there are growing sociocultural attitudes and behaviours towards a desirable appearance and body type for males. Conversely, females have had societal and cultural standards predicating an ideal female body for some time (Loosemore and Moriarty,1990).

In the Journal of Youth and Adolescence, Duncan et al. (1985) reported that maturing males were satisfied with their height and weight, while females were dissatisfied with their weight only. Females expressed a desire to become thinner while males did not. "Thus, a normal developmental process is being viewed negatively by females and positively by males" (Duncan et al., 1985,p.222).

Cohn et al. (1987), conducted research in an urban middle school; which was published in the Journal of Abnormal Psychology. The study comprised 283 boys and 288 girls (160 sixth graders, 176 seventh graders, and 235 eight graders) with a mean age of 13.0 years for males and females. Findings of the researcher noted the males surveyed selected an ideal figure that was significantly heavier than the figure they perceived as most attractive to females. Females "chose an ideal figure that was significantly thinner than the figure they considered most

attractive to boys" (Cohn et al.,1987,p.277). The ideal figure was defined as the figure they perceived as attractive to one's self and opposite sex. Based on a chosen ideal figure, males and females were both equal in being dissatisfied with their bodies (males underestimated their body size and females overestimated). This was true of all ages and there was no significant differences recorded on the current, ideal or attractive ratings among the grade levels of subjects.

Cohn et al. (1987) and Fallon and Rozin's (1985) in the Journal of Abnormal Psychology revealed that adult males thought adult females liked a heavier physique than the females reported they found desirable. In turn, males reported themselves as being under weight and sought a more mesomorphic body figure. Tobin-Richards et al. (1983) in their study also concluded that adolescent males perceived themselves as under weight, contrasting with females who viewed themselves as over weight.

Mintz and Betz (1986), in the article "Sex Differences in the Nature, Realism, and Correlates of Body Image" in Sex Role, studied 135 college women and 129 college men. The study reported that male who were dissatisfied with their figure perceived themselves as under weight. Females who were dissatisfied with their figure perceived themselves as over weight. Males wanted to gain weight and females wanted to lose weight. Keith (1991), Ford (1991), and Gray (1977)

concluded that males perceived themselves as appearing lighter than they actually were and females viewed themselves heavier than they actually were.

In Health Psychology, Rosen and Gross's (1987) article reported that 28.45% of the males tested were attempting to gain weight compared to 16% who were attempting to lose weight. In comparison 63% of females who were on a weight reducing regimen, while only 9.1% of females were trying to gain weight. The primary method for male and females adolescents to gain weight or lose weight was by exercise and caloric manipulation. The authors also noted that very few boys engaged in methods such as vomiting, appetite suppressants or laxatives to lose weight. None of the boys surveyed used purging as a means to lose weight.

Lerner and Korn (1972) in, "The Development of Body-build Stereotypes in Males" reported in Child Development found mesomorphy to be the most favourable body-build to males. Subjects had an unfavourable view of the endomorphic and ectomorphic body-build. The authors felt that our health, youth and athletic orientated society depicts the mesomorph as the infallible body-build.

Types of Anabolic Steroids - Trade and Generic Names

There are two types of steroids, those administered orally or by injection. Table 1, Oral and Injectable Anabolic Steroids, list the various oral and injectable steroids, with both the trade name and generic names of

Table 1

Oral and Injectable Anabolic Steroids

Oral

Trade Name	Generic Name
Anadrol	Oxymetholone
Anavar	Oxandrolone
Dianabol	Methandrostenolone
Maxibolin	Ethylestrenol
Methyltestosterone	
Primobolan	Methenolone
Proviron	Mesterolone
Winstrol	Stanozolol

Injectable

Trade Name	Generic Name
Anatrofin	Stenobolone
Bolfortan	Testosterone Nicotinate
Deca-Durabolin	Nandrolone Decanoate
Delatestryl	Testosterone Enanthate
Deca-Testosterone	Cypionate
Dianabol	Menthandrostenolone
Durabolin	Nandrolone Phenpropionate
Enoltestovis	Hexoxymestrolum
Equipoise	Boldenone - veterinary
Primobolan	Methenolone Enanthate
Sustanon 250	a mixture of testosterone esters
Therobolin	
Trophobolene	
Wintrol V	Stenozolol - veterinary

(Strauss,1987,p.61)

each.

Adverse Effects of Steroids

Since the introduction of steroids into society, many scientists have speculated that there are negative side effects associated with the use of steroids. However, any studies conducted on the ramifications of steroid use were based on "cross-sectional, short term longitudinal and case studies..." (Hickson et al.,1989,p.255) and provided little understanding of the "extensiveness and mechanism involved in the occurrence of adverse effects" (Hickson et al.,1989,p.255). Dosages of steroids taken by some individuals are much higher than physician recommended dosages; therefore, an ethical dilemma arises regarding the use of humans in steroid related research (Kruth,Maniera and Nieschlug,1989; and Windsor and Dumitru,1989).

Table 2, Steroid Side Effects, list some of the side effects revealed by reviewing the literature. Scientific research has identified many of the possible negative side effects associated with steroid use, however the use of steroids by individuals still exists. Apparently, people are not completely convinced of the harmful consequences of steroid use, perhaps because of the lack of longitudinal research clearly associating the use of steroids with harmful side effects.

TABLE 2

Steroid Side Effects

-Lowered sperm count in males (testicular atrophy)
-Development of acne
-Lower voice (female)
-Facial hair (female)
-Clitoral enlargement (female)
-Diminishing breast size (female) and gynecomastia [softening of the breast tissue] (male)
-Baldness (male)
-Liver - malignant and benign liver tumours, also peliosis hepatis [blood filled sacs develop in the liver]
-Heart- hypertension, cardiac arrhythmia (enlarged heart)
-Stunted growth, due to closure of bony epiphyses
-Aids [Acquired Immune Deficiency Syndrome], from sharing of needles used for intramuscular steroids
-Hepatitis [sharing of needles]
-Musculoskeletal Injuries- brought on by psychological effects of steroids, causing an athlete to over extend, stretch and overtrain muscles, tendons and joints
-Diabetes- due to higher post glucose serum insulin concentrations
-Habitation and associated characteristics (i.e., withdrawal symntoms)
-Increased aggression- irrationally destructive behaviour
-Depression and related behaviours (i.e. suicidal behaviour)

(Hickson et al.,1989; Kruth,Maniera and Nieschlug,1989; and Windsor and Dumitru,1989).

Note: For further adverse effects of steroid use refer to Appendix A.

Summary

Current literature has revealed that steroid use by high school students is a 'growing' problem (cf. Dubin,1990). Literature pertaining to the reported use of steroids by Canadian high school students is scarce. It is up to Canadian researchers to close the research gap.

The Canadian study conducted by the ARF (1989-91) reported that there is steroid use by high school students in this country and that this problem is predominantly a male phenomenon (2.1% male steroid users, .2% female steroid users). Other studies also revealed that students are using these drugs for the purpose of appearance and performance enhancement (Anderson et al.,1991; Krowchuk et al.,1989; and Duda,1988).

Justification and Significance

A review of literature has revealed the ARF (1989-91) study was the only reported Canadian based research that explored the use of steroids by students. Although the ARF (1989-91) reported the use of steroids by students, the study did not report findings of high school students, but rather the student population in general. For example, the subjects of the ARF study comprised of students ranging in age from 13 or less, to 18 years or over. The literature review also revealed an American study conducted by researchers Terney and McLain (1990) in Chicago which is the only "report detailing the actual incidence of use of these

drugs [steroids] in this population" (Terney and McLain,1990,p.100).

A study of this nature must be conducted for the following reasons:

1) There is a need for more data reporting on the use, potential use and nonuse of steroids by high school students in Canada. Little literature is available that reports on the use and potential use of steroids by high school students even in the U.S.A. (Harris,1982; Johnson et al.,1989; McFarland,1991; and ARF,1989-91).

2) If there is steroid use by high school students, school officials, teachers, and coaches should have an understanding of the extent to which student(s) steroid use has occurred, or may occur, and gain insight into the characteristics of those involved. If officials, teachers, and coaches understand the reason behind steroid use they could develop preventive programs to deal with and manage the use or potential use of steroids by students. The need to educate students concerning steroids is obvious (White et al.,1987) "because the side effects are too drastic" as McFarland (1991,p.13) stated. The first step is to survey students to determine the actual and potential use of steroids and, subsequently, to determine the purpose and underlying causes associated with this use.

Statement of the Problem/Hypotheses

This study investigated the degree of use of anabolic steroids by secondary students in Southwestern Ontario. The major variables to be considered are, degree of steroid use in relation to gender, participation in an organized sport, Body Image Distortion (BID), school location, beliefs about steroids, grade/age of students, thoughts, enquiry and ease of obtaining steroids.

Gender

1. It was hypothesized that males would be significantly more inclined to use steroids than females.

Athletes vs Nonathletes

2. It was hypothesized that there would be a significant difference in the use of steroids between athletes (male and/or female) and nonathletes (male and/or female).

2.1 It was hypothesized that there would be a significant difference in the use of steroids between athletes (male and/or female) in weight related sports verses athletes (male and/or female) in nonweight related sports.

BID

3. It was hypothesized that there would be a significant difference between the BID scores of males and females.

3.1 It was hypothesized that there would be a significant difference in the use of steroids by students (male and/or female) that had underestimated BIDs compared to students (male and/or female) who had reported normal and overestimated BIDs.

3.2 It was hypothesised that there would be a significant difference in the use of steroids between the BIDs of athletes (male and/or female) and nonathletes (male and/or female).

3.3 It was hypothesized that there would be a significant difference in the use of steroids between the BIDs of athletes (male and/or female) in weight related sports and athletes (male and/or female) in nonweight related sports.

Grade Of Students

4. It was hypothesized that there would be a significant difference in the use of steroids between junior grades (9-10) and senior grades (11,12,0AC).

4.1 It was hypothesized that there would be a significant difference in the use of steroids between athletes (male and/or female) and nonathletes (male and/or female) in junior and senior grades.

Location

5. It was hypothesized that there would be a significant difference in the use of steroids between rural and urban students.

Beliefs about steroids (amount of medical/health risk associated with steroids - steroids help with speed - steroids build muscle strength).

6. It was hypothesized that there would be a significant difference in the beliefs about steroids between males and females.

6.1 It was hypothesized that there would be a significant difference in the beliefs about steroids between athletes and nonathletes.

Thoughts, enquiry and the ease of obtaining steroids.

7. It was hypothesized that there would be a significant difference in the thought, enquiry and the ease of obtaining steroids between males and females.

7.1 It was hypothesized that there would be a significant difference in the thought, enquiry and the ease of obtaining steroids between athletes and nonathletes.

Scope of the Study

The study was conducted during the academic calender year of 1992 in Southwestern Ontario. Four hundred and forty male and female high school students participated in

the study. A representative sample of 440 students was used in order to ensure that there was a sufficient numbers of males and females and also an equal representation of athletes and nonathletes in the population.

Limitations

The major limitations were (1) the honesty of individuals who filled out the questionnaire, (2) incomplete questionnaires and 3) the absence of students on the day of testing.

Delimitations

The major delimitations were (1) only male and female high school students in Southwestern Ontario were used as subjects and (2) only anabolic steroids were assessed as a substance to enhance performance and appearance.

Independent Variables

-Gender (male and female)

-Athletes, nonathletes (in a weight related and nonweight related sports)

-Grade level of students/Age (Grades 9 and 10 versus 11-13(OAC)

-BID (underestimators, normal, and overestimators)

-Beliefs about steroids (amount of medical/health risk associated with steroids - steroids help with speed -steroids build muscle strength)

-Thoughts, enquiry and ease of obtaining steroids

-Location of school (rural versus urban)

Dependent Variables

-Anabolic steroid use (nonuse, potential and actual use)

Definition of Terms

-Anabolic-androgenic steroids/anabolic steroids/steroids: 'are synthetic derivatives of testosterone, commonly referred to as the 'male hormone'" (White et al.,1987,p.32). The term anabolic means 'tissue building' (Strauss,1987).

-Body Image Distortion (BID): "is a disturbance of the internal perceptual image that one has about one's body"
(Lossemore and Moriarty,1990,p.12)

-Underestimated BID: An underestimated BID is a BID score less then zero.

-Normal BID: A normal BID is a BID score that equals zero

-Overestimated BID: An overestimated BID is a BID score greater then zero.

-Ideal Body: What one perceives to be attractive to one's self and desirable other(s).

-Athlete: An athlete is one who participates in organized sports (i.e., inter-school sport and/or community sport.

-Weight Related Sport: A weight related sport is a sport where weight could be an advantage (e.g., football, wrestling).

-Potential steroid user: A potential steroid user is a student who would consider steroid use.

-Steroid User: A steroid user is a student who had tried/is using steroids.

-Nonuser: A nonuser is an individual who has not used steroids or would never consider using steroids.

CHAPTER II

METHOD

Procedure for Collecting Data

a) Selection of Subjects: Four hundred and forty high school students in Southwestern Ontario High Schools were surveyed.

b) Development of the Instrument: A 27 item questionnaire was used in this study. (Refer to Appendix B and Appendix C) Questions from three separate questionnaires were used to create the 27 item instrument to investigate the degree of and intent to use anabolic steroids by secondary students in Southwestern Ontario.

1) The Body Size Distortion Questionnaire (BSDQ) developed by Mable, Balance, and Galgan, (1986) measured the BID's of students. "Mable (1989) found the BSDQ to have a test-retest reliability of .92 in a total population sample of 81 male and female undergraduates, for the females .92 and for the males, .87 [p<.0001]" (Ford,1990,p.35), via a Pearson product - moment correlation.

2) Body silhouettes by Tanner (1984) [male] and Stunkard, Sorenson and Schulsinger (1983) [female] retrieved from the Body Image and Exercise Adherence Questionnaire developed by Duffy (ND) reported the perceptions students had towards their own bodies as well what an ideal (preferred) body should look like.

3) Questions developed through the modification of a

questionnaire by Terney and McLain's (1990) investigated the incidence of steroid use by high school students.

Males completed the questionnaire in Appendix B (Part A and Part B) and females completed the questionnaire contained in Appendix C (Part A and Part B). These instruments [Appendix B and C] provided data on males' and females' steroid use.

Part A of the questionnaires yielded results of BID's for males and females. Questions 4-7, determined body size distortion, derived from the BODY SIZE DISTORTION QUESTIONNAIRE (BSDQ). The BSDQ is calculated from information given by the subjects (Questions 4-7, height, weight, size of body frame, and how the subjects feel about their body size) and by the use of a formula based on a standard measure, The Metropolitan Height and Weight Tables: Midpoints. Appendix D, contains a sample calculation for BSDQ and Appendix E and F contains the Metropolitan midpoints for both men and women respectively. Part B, of the questionnaire yielded results of subject characteristics and the incidence of steroid use, potential use or nonuse among high school students.

Three 7-point Likert scale items in Part B (# 6, 15, 16) provided information on the beliefs students have about steroids (# 6 = amount of risk associated with steroids; # 15 = steroids help with speed; 16 = steroids build muscle strength). Three other 7-point Likert scale items in Part B

measured the amount of thought (#10), amount of enquiry about steroids (#11), and the ease of obtaining steroids by subjects(#17). Refer to Appendix B and/or C.

c) Administration of Instrument: In order to administer the questionnaire to students, the researcher followed the outlined procedures:

1) Permission was obtained from the ethics committee at the University of Windsor to conduct research.

2) The city and county school board(s) administration was contacted to secure permission to enter the schools and survey the students.

3) The school board(s) administration and participating schools were assured anonymity for all schools and students surveyed in the study.

4) Classes surveyed were selected by mutual agreement of the teachers and researchers to ensure quota samples in a variety of grades and subjects.

5) The questionnaire and necessary consent form(s) were administered by the researcher. During the Spring of 1992, the researcher visited the various schools and classes mutually agreed to by the researcher and school board administration.

6) Each student was given a questionnaire, a consent form (Appendix F) and an unmarked envelope in which to place the completed questionnaire. Students were allowed regular class time to complete the questionnaire. Consent forms

were collected by the researcher prior to any subjects beginning the questionnaire. Once a student had completed the questionnaire, he/she enclosed the completed survey in the envelope provided and placed the sealed envelope in a box located at the back of the classroom.

7) No discussion among subjects was allowed during completion of the questionnaire.

8) Subjects were allowed to ask any questions they had concerning the Study, prior to starting completion of the questionnaire.

9) No questions were allowed during the testing procedure.

Treatment of the Data

a) Coding of the Data: All questionnaires were scored after all data was collected. This was then transferred into a data file in SPSSx, at the University of Windsor, for analysis.

Categorical responses (e.g., Yes or No) were analyzed through cross tabulation and Chi-Square analyses. Responses involving categories and continuous measures (e.g. BID scores) were statistically analyzed by means of ANOVA's (one -way and two - way) and MANOVA'S. The criterion significance level for all analyses was $p<.05$.

CHAPTER III

RESULTS

Three groups emerged from the preliminary analysis of the data concerning the use of steroids by high school students. The three groups were as follows: 1) actual users (had tried steroids,n=8); 2) potential users (would use steroids,n=68); and 3) nonusers (had never tried or would not use steroids,n=311). Actual and potential users were combined as potential/actual for the reasons listed below.

Actual and potential users were combined because past literature has suggested that potential users are more similar to actual users but are different from nonusers. Schwerin and Corcoan (1992) reported that individuals who are more likely to use steroids [potential] share the same beliefs about steroids as users [actual] but are different than nonusers.

Also, initial analysis of the three groups in this study showed that potential users were more similar to actual users in their beliefs about steroids than nonusers. A MANOVA showed that there was a significant difference in the beliefs (amount of risk associated with steroids - steroids help with speed - steroids build muscle strength) about steroids between actual users, potential users and nonusers $F(6,780)= 14.7$ $p<.001$. However, when the means of the three groups (actual - potential - nonusers) are

reviewed (See Appendix H) potential users are more similar to actual users than nonusers once again.

The data obtained from the two evolved groups (potential/actual and nonusers) provide direction to administrators, teachers and coaches to develop programs to manage steroid use by students. Officials, teachers, and coaches are able to develop preventive programs for steroid use in high schools because they have been provided with a resource [results of this study] that indicated the extent of steroid use and why steroid use may or had occurred as well an indication of which students are most likely to be involved in actual or potential steroid use. To provide some further insight into the actual use of steroids by high school students a summary of the actual users is provided at the end of this chapter.

Subject Characteristics

Four hundred and forty South Western Ontario students from ten different high schools (six urban and four rural) were recruited for this study. There were 253 (57.5%) males and 187 (42.5%) females from grades nine through to the O.A.C. level. Subjects ranged from 12 years to 21 years in age. Both males and females had a mean age of 16.4 years of age. Refer to Table 3 Subject characteristics.

In terms of Body Image Distortion (BID) both males and females overestimated body size. Males overestimated modestly ($\bar{X}$=3.1) with a range from -39.4 to + 40.3, while

Table 3

Subject Characteristics						
N=440, 253 (57.5%) males, 187 (42.5%) females						
Variable	Sex	$\bar{X}$	SD	Range	Responses	
					N	% N=440
Age	m	16.4	1.5	12-21	221	50.3
	f	16.4	1.4	14-20	117	26.6
BID	m	3.1	13.6	-39.4 to +40.3	212	73.3
	f	13.6	13.6	-36.1 to +45.2	158	42.7
		Frequency			N	% N=440
		n	%			
Junior Students	m/f	166	41.8		399	90.7
	m	91	41.2		221	50.2
	f	75	42.6		176	40
Senior Students	m/f	231	58.2		399	90.7
	m	130	58.8		221	50.2
	f	101	54.4		176	40
Athletes	m/f	251	64.0		392	89.1
	m	163	75.1		217	49.3
	f	88	50.3		175	39.8
Nonathletes	m/f	141	36		392	89.1
	m	54	24.9		217	49.3
	f	87	49.7		175	39.8
Athletes in a weight related Sport	m/f	105	32.2		329	74.8
	m	87	83		106	24.1
	f	18	17		106	24.1

females overestimated markedly ($\bar{X}$=13.6) with a range -36.1 to + 45.2. In terms of grades in school, 41.8% (N=399) of students were junior (9,10) and 58.2% (N=399) were senior students (11,12,13). Within the student athlete population (n=251; 64.0%, N=392) there were 163 (75.1%, N=217) male and 88 (50.3%, N=175) females. Of the 251 athletes, 105 (32.2%, N=329) athletes participated in a weight related sport, 87 males (83%, N=106) and 18 females (17%, N=106).

Medical Problems

Subjects (N=377) reported they visited a physician on the average of 7.8 times a year. Injuries that required medical attention was on the average of 4.4 times per year. The average medication for a sport injury from a physician was 8.3. Fourteen ($\bar{X}$=1.697, SD=.18) athletes reported that they had received medication for a sport injury from the coaching staff or a teacher. Refer to Table 4, Medical Problems, Medication from a Coach/Teacher to an Athlete, and Type of Medication Given.(82%) more so than to improve sports performance (18%).

What Students Perceived They Look Like and What They Perceive as the Ideal Body Build

Three hundred and nineteen (72.5%) subjects placed an "X" over a silhouette that represented their own body build. Table 5, What students perceived they looked like reports these results. Most of the male (n=79; 42.2%, N=187) population felt they had a build similar to silhouette number three with numbers two (23%) and four (19.3%) the

Table 4

Medical Problems						
Visited a physician in a year?	m/f	7.8	14.3	1-99	377	85.7
	m	4.1	10		181	41.1
	f	5.6	7.6		160	36.4
Injuries in the past year that required seeing a physician?	m/f	4.4	8.2	1-67	2234	52.2
	m	2.3	2.9		120	27.3
	f	5.6	7.6		83	18.9
Medication from a physician for sport injury?	m/f	8.3	15.2	1-56	130	29.5
	m	2.2	5.4		69	15.7
	f	1.5	0.8		35	7.9

Medication from a Coach/Teacher to an Athlete				
Sex	$\bar{X}$	SD	Responses	
			N	% N=440
m/f	2	.2	416	94.5
m	2	.2	220	50.0
f	2	.2	178	40.0

Type of Medication Given:	
medication	frequency
ice / bandages / heat	11
tylenol 3	1
aspirin	1
tylenol	1

Table 5

What students perceived they look like			
Sex	Silhouettes	Frequency	Percentage
Males (N=187)	1	7	3.7
	2	43	23
	3	79	42.2
	4	36	19.3
	5	17	9.1
	6	2	1.1
	7	3	1.6
Females (N=155)	1	2	1.3
	2	16	10.3
	3	63	40.6
	4	39	25.2
	5	25	16.1
	6	7	4.5
	7	3	1.9

next most frequently chosen. The majority of females (n=63; 40.6%, N=155) perceived themselves as looking most similar to silhouette number three with numbers four (25.2%) and five (16.1%) next most frequently chosen.

Males and females also ranked the silhouettes from 1 (most preferred) to 7 (least preferred) and these results are reported in Tables 6 Male Ranking/Ideal Body Build and 7 Female Ranking/Ideal Body Build. Males chose silhouette 4 (87.4%, N=199) as the most preferred or ideal body build for males. Females selected silhouette 3 (56%, N=172) as the most preferred or ideal body build for females. Both males and females perceived silhouette 7 [for their own sex] as the least preferred or least ideal body build, males (88%, N=200) and females (77.3%, N=172) respectively.

Gender

1. It was hypothesized that males would be significantly more inclined to use steroids than females.

Seventy six out of 387 (19.6%) of students reported they were potential/actual users of steroids. There were 51 (24.1%, N=212) males who reported potential/actual use. Within the population of males potential/actual users, seven (13.7%, N=51) males were actual users or 1.9% (N=387) overall. Females (n=25; 14.3, N=175) potential/actual users were roughly half the number of potential/actual male users (n=51,24.1%). One (4%, N=25) out of the female potential/actual users was an actual user. Refer to Table 8, Potential/Actual Users vs Nonusers by Sex. A chi-square

Table 6

Male Rankings/Ideal Body Build (1=most preferred, 7=least preferred)			
Silhouette	Ranking	Frequency	Percentage
Silhouette 1 (N=199)	1	4	2
	2	4	2
	3	5	2.5
	4	45	22.6
	5	80	40.2
	6	45	22.6
	7	16	8
Silhouette 2 (N=200)	1	2	1
	2	10	5
	3	109	54.5
	4	64	32
	5	11	5.5
	6	4	2
	7	0	0
Silhouette 3 (N=199)	1	15	7.5
	2	151	75.9
	3	24	12.1
	4	4	2
	5	2	1
	6	3	1.5
	7	0	0
Silhouette 4 (N=199)	1	174	87.4
	2	12	6
	3	3	1.5
	4	4	2
	5	0	0
	6	5	0.5
	7	22	2.5
Silhouette 5 (N=199)	1	0	0
	2	21	10.6
	3	52	26.1
	4	72	36.1
	5	46	23.1
	6	6	3
	7	2	1
Silhouette 6 (N=199)	1	1	0.5
	2	2	1
	3	4	2
	4	11	5.5
	5	56	28.1
	6	124	62.3
	7	1	0.5
Silhouette 7 (N=200)	1	3	1.5
	2	2	1
	3	1	0.5
	4	2	1.0
	5	3	1.5
	6	13	6.5
	7	176	88.0

Table 7

Female Rankings/Ideal Body Build (1=most preferred, 7=least preferred)			
Silhouette	Ranking	Frequency	Percentage
Silhouette 1 (N=172)	1	2	1.2
	2	3	1.7
	3	23	13.4
	4	22	12.8
	5	24	15.1
	6	58	33.7
	7	38	22.1
Silhouette 2 (N=172)	1	27	15.7
	2	67	39
	3	21	12.2
	4	31	18.0
	5	21	12.2
	6	5	2.9
	7	0	0
Silhouette 3 (N=172)	1	100	56.2
	2	47	26.4
	3	20	11.2
	4	4	2.2
	5	1	0.6
	6	0	0
	7	0	0
Silhouette 4 (N=172)	1	30	17.4
	2	38	22.1
	3	72	41.9
	4	31	18
	5	0	0
	6	1	0.6
	7	0	0
Silhouette 5 (N=172)	1	13	7.6
	2	15	8.7
	3	29	16.9
	4	65	37.8
	5	48	27.9
	6	2	1.2
	7	0	0
Silhouette 6 (N=172)	1	0	0
	2	1	.6
	3	4	2.3
	4	18	10.5
	5	71	41.3
	6	76	44.2
	7	2	1.2
Silhouette 7 (N=172)	1	1	0.6
	2	0	0
	3	2	1.2
	4	1	0.6
	5	5	2.9
	6	30	17.5
	7	133	77.3

Table 8

Potential/Actual User vs Nonusers by Sex					
Variable	Sex	Frequency		Responses	
		n	%	N	% N=440
potential/ actual user	m/f	76	19.6	387	88
	m	51	24.1	212	48.3
	f	25	14.3	175	39.7
nonusers	m/f	311	80.4	387	88
	m	161	75.9	212	48.3
	f	150	85.7	175	39.7

revealed that there were significantly more male (n=51; 24.1%, N=212) potential/actual users of steroids than females (n=25; 14.3%, N=175) X^2 (1,1) = 5.79, p<0.05. One hundred and sixty one males (75.9%, N=212) were nonusers and one hundred and fifty (85.7%, N=175) females were nonusers as shown in Table 8.

Purpose Behind Steroid Use

Table 9 reports the Purpose behind potential/actual steroid use. Forty three potential/actual users reported steroid use for muscle development/appearance (n=31; 72.1%, N=43) and twelve (27.9%, N=43) for sports (athletic performance). Twenty two male (68.8%, N=32) potential/actual users recorded steroid use for muscle development/appearance and ten (31.3%, N=32) for sports. Males reported significantly more potential/actual use of steroids for muscle development/appearance (n=22; 68.8%, N=32) than for sports (n=10; 31.3%, N=32) X^2 (1,1) = 6.3, p<0.05.

Table 9 also outlines that seven (77.1%, N=9) females reported potential/actual use of steroids for muscular development/appearance and 2 (22.9%, N=9) for sports. A chi-square revealed no significant differences between males and females toward the purpose behind (muscle development/appearance [males n=22, females n=7] and sports [males n=10, females n=2]) potential/actual steroid use.

Athletes noted potential/actual use of steroids for

Table 9

Purpose Behind Potential/Actual Steroid Use								
	Sex	Potential /actual users frequency	muscular development /appearance		Sports		Responses	
							N	% N=440
Athletes non-athletes	m/f	43	31	72.1%	12	27.9%	153	34.8%
	m	32	22	68.8%	10	31.3%	92	21%f
	f	9	7	77.1%	2	22.9%	52	11.8%
Athletes	m/f	34	23	67.6%	11	32.4%	110	25%
	m	27	18	66.7%	9	33.3%	78	17.7%
	f	5	3	60%	2	40%	25	5.7%
Non-athletes	m/f	8	7	87.5%	1	12.5%	38	8.6%
	m	4	3	75%	1	25%	13	3%
	f	4	4	100%	0	0%	24	5.5%

muscle development/appearance (n=23; 67.6%, N=34) and sports (n=11; 32.4, N=34). Athletes reported significantly more potential/actual user of steroids for muscle development/appearance (n=23; 67.6%, N=34) than for sports (n=11; 32.4%, N=34) X^2 (2,1) = 7.92, $p<0.05$. A sizable difference was recorded between the potential/actual use of steroids for enhancing muscle development/appearance (n=7; 87.8%, N=8) and sports (n=1; 12.5%, N=8) by nonathletes.

Forty-eight (11.6%, N=415) students reported that a friend had suggested to them to use steroids and nineteen (4.9%, N=413) had a teammate suggest steroid use as shown in Table 10, Who suggested to students to use steroids.

Friends That Use Steroids

When students were asked if they had a friend who used steroids, 160 students (34.1%, N=440) reported they had. For further analysis of students who have a friend(s) that used steroids, the number of friends (as reported by the subject) was categorized into two groups: 1) less than four friends that have used and 2) four or more friends that have used steroids. These results are reported in Table 11, Friends that Use Steroids.

Table 11, Friends that used steroids, shows that 61 males (40.7%, N=151) had less than four friends who used steroids and 44 (29.3%, N=151) males had four or more friends who used steroids. Thirty-six females (24%, N=150) revealed that they had four or less friends who used

Table 10

Who Suggested to Students to Use Steroids				
Who suggested	Frequency	Percent	Responses	
			N	% N= 440
friend	48	11.6	415	94.3
teammate	19	4.6	413	93.9
physician	3	0.7	413	93.9
parent	1	0.2	413	93.9
coach	2	0.5	413	93.9
teacher	0	0	413	93.9
other	9	0.2	413	93.9

Table 11

Friends that Use Steroids							
Variable	Sex	Less then 4 friends		4 or more friends		Responses	
		n	%	n	%	N	% N=440
Have friends that use steroids	m	61	40.7	44	29.3	151	34.3
	f	36	24	9	6	151	34.3
Actual / Potential user with friends that use steroids	m	17	17.7	17	17	96	21.8
	f	6	11	3	5.6	54	12.3
Non Users with friends that used steroids	m	44	45.8	18	18.8	96	21.8
	f	38	70.4	7	13	54	12.3
Purpose behind a friend(s) use of steroids?	Reason			n	%	N	% N=440
	muscle development / appearance			123	82	150	34.1
	sports			27	18		

steroids and nine (6%, N=151) females had four or more friends who used steroids. A chi-square analysis showed that there is an association between the number of friends who used steroids and gender (X^2 (1,1) = 5.7, $p<0.05$). Males (n=61) had almost twice as many friends [less than four] who used steroids than females (n=36). Also, males (n=44) had a little over four times as many friends [four or more] who used steroids than females (n=9). Respondents felt friends used steroids for muscle development/appearance.

Male potential/actual users had more friends who used steroids (less than four n=17, four or more n=17) then female potential/actual users (less than four n=6, four or more n=3) as reported in Table 5. Male nonusers had more friends who used steroids than female nonusers. A chi-square analysis revealed that potential/actual users (n=151, 28.1% N=160) have significantly more friends who use steroids than nonusers (80.4%, N=387) $X^2(1,1)= 8.25$, $p<0.01$.

Athletes vs Nonathletes

2.0 It was hypothesized that there would be a significant difference in the use of steroids between athletes (male and/or female) and nonathletes (male and/or female).

Two hundred and fifty one (64%, N=392) of the students were athletes who participated in organized sport (interschool sport and/or amateur sport). Thirty six percent of responses (N=392) were nonathletes. Refer to Table 3, Subject characteristics.

There were 163 (75.1, N=217) male athletes and 54 (24.9% N=217) male nonathletes. There were 88 female (50.3%, N=175) athletes and eighty seven (49.7%, N=175) female nonathletes. Table 3, shows that within the population of athletes 106 (32.2%, N=329) participated in a weight related sport. Of the 106 athletes in a weight related sport 87 (83%, N=106) were male and 18 (17%, N=106) were female. Table 12 outlines the thirty various sports and activities students participated in (both nonweight and weight related sports).

Table 13 presents the results for Athletes vs Nonathletes: Potential/actual users vs nonusers. Thirty eight male athletes (18.4%, N=207) reported they were potential/actual users of steroids. Only 11 (5.6%, N=207) male nonathletes were potential/actual users of steroids. There was no significant differences of potential/actual steroid use between male athletes and male nonathletes.

Fourteen female athletes (8.1%, N=172) were potential actual users of steroids while eleven (6.4%, N=172) nonathletes were potential/actual users. Being a female athlete (n=14; 8.1%, N=172) or nonathlete (n=11; 6.4%, N=172) had little significance on the potential/actual use of steroids. Refer to Table 13.

More male athletes (n=38; 18.4%, N=207) were potential/actual users of steroids than female athletes (n=14, 8.1% N=172). No significant difference was observed

Table 12

Sports and activities students participate in (** = weight related sports)	
Sports:	Activities:
hockey **	dancing
football **	jogging
soccer	soccer
volleyball	walking
basketball	weightlifting
wrestling **	basketball
badminton	swimming
swimming	jet skiing
track and field	water skiing
gymnastics	cycling
tennis	tennis
baseball	aerobics
dance	football
curling	figure skating
bowling	baseball
broomball **	hockey (ice/ball)
golf	grass cutting
lacrosse **	physical education class
karate **	hunting
power lifting **	fishing
squash	rowing
cycling	beach volley ball
figure skating	and various other leisure activities.
boxing **	
motor cross	
cheer leading	
skiing (downhill)	
biathlon	
body building **	
skate boarding	

Table 13

Athletes vs Nonathletes: Potential/Actual User vs Nonusers						
Variable		Sex	Frequency		Responses	
			n	%	N	% N=440
Nonathletes	potential /actual users	m/f	22	6.4	394	52
	non-users		116	29.4		
	potential /actual users	m	11	6.4	207	47
	non-users		40	19.3		
	potential /actual users	f	10	5.8	172	39.1
	non-users		74	43		
Athletes	potential/ actual users	m/f	54	13.7	394	90
	non-users		202	51.3		
	potential/ actual users	m	38	18.4	207	47.1
	non-users		118	57		
	potential/ actual users	f	14	8.1	172	39.1
	non-users		73	42.4		

between the potential/actual use of steroids by male nonathletes (n=11; 5.6%, N=207) and female nonathletes (n=11; 6.4%, N=172). A chi-square revealed that athletes (males n=38; 18.4%, N=207 and females n=14; 8.1%, N=172)reported significantly higher potential/actual user of steroids than nonathletes (males n=11; 5.6%, N=207 and females n=11; 6.4%, N=172).

A chi-square revealed that being a potential/actual steroid using athlete (male or female) who has considered a career as a professional athlete (N=147) had no affect on whether an athlete (males n=25; 16.3%, N=104, female n=7; 8.2%, N=35) was a potential/actual user. Refer to Table 14, Career as a professional athlete by potential/actual users.

2.1 It was hypothesized that there would be a significant difference in the use of steroids between athletes (male and/or female) in weight related sports verses athletes (male and/or female) in nonweight related sports.

There were twenty-two athletes (25.%, N=87), all male, who participated in weight related sports who were potential/actual users of steroids. Only one athlete (1.1%, N=87), a male, was a potential/actual user who participated in a nonweight related sport. Refer to Table 15, Athletes in a weight related sport (wt sport) vs athletes in a nonwt sport: Potential/actual users and nonusers. Athletes (n=22; 20.7, N=111) in weight related sports reported significantly higher potential/actual use of steroids than athletes (n=1; .9%, N=111) in nonweight related sports (X^2 (1,1) = 5.9, $p<0.05$).

Table 14

Career as a Professional Athlete by Potential/ Actual Users					
		Career as professional		Responses	
		n	%	N	% N=440
Athletes	potential/actual users	33	13.2	147	33.4%
	non-users	114	45.6		
Non-athletes	potential/actual users	8	5.8	35	8%
	non-users	27	19.7		
Male athletes	potential/actual users	25	16.3	104	23.6%
	non-users	79	51.6		
Male non-athletes	potential/actual users	5	10	26	5.9%
	non-user	21	42		
Female athletes	potential/actual users	7	8.2	35	8%
	non-users	28	32.9		
Female non-athletes	potential/actual users	3	3.5	8	1.8%
	non users	5	5.9		

Table 15

Athletes in a Weight Related Sport (Wt Sport) vs Athletes in a Nonwt sport: Potential/Actual and Nonusers					
Variable	Sex	Frequency		Responses	
		n	%	N	% N=440
Athletes in a wt sport potential/actual user	m/f	22	20.7	111	25.2
	m	22	25.3	87	19.8
	f	0	0	18	19.8
Athletes in a nonwt sport potential/actual user	m/f	1	.9	111	25.5
	m	1	1.1	87	19.8
	f	0	0	18	4.1
Athletes in a wt sport nonuser	m/f	63	56.8	111	25.2
	m	56	64.4	87	19.8
	f	2	11.1	18	4.1
Athletes in a nonwt sport nonuser	m/f	24	21.6	111	25.2
	m	8	9.2	87	19.8
	f	16	88.9	18	4.1

Body Image Distortion (BID)

3. It was hypothesized that there would be a significant difference between the BID scores of males and females.

Three hundred and seventy (N=370) subjects (males 57.3%, N=212) and females (42.7%, N=158) reported their body image distortion (BID). Refer to Appendix H.

Males mean BID was 3.1 (SD=13.55) and the female's mean BID mean was 12.31 (SD=13.45). Males BID's ranged from -38.39 to 40.26% while the females BID's ranged from -36.05 to 45.24%. Refer to Table 3 Subject characteristics. An ANOVA showed that females ($\bar{X}$= 12.31) significantly overestimated their BID's compared to males ($\bar{X}$= 3.1), F (1, 368)=42.8, p<0.01. Not a single student reported a normal (0%) BID (Refer to Appendix I).

3.1 It was hypothesized that there would be a significant difference in the use of steroids by students (male and/or female) that had underestimated BIDs compared to students (male and/or female) who had reported normal or overestimated BIDs.

A two-way ANOVA revealed that males who had underestimated ($\bar{X}$ = -.39) BID's were significantly higher potential/actual users compared to overestimators ($\bar{X}$ = 3.96) who did not use. Conversely, females who had overestimated ($\bar{X}$ = 16.84) BID's were potential/actual users versus those females that overestimated to a lesser extent ($\bar{X}$ = 11.28) and did not use, F (1,354) = 7.31, p <.001.

3.2 It was hypothesised that there would be a significant difference in the use of steroids between the BIDs of athletes (male and/or female) and nonathletes (male and/or female).

Male athletes (n=15; 10.1%, N=149) who had underestimated BID's were not significantly more to be potential/actual users than male athletes (n=22; 14.8%, N=149) who had overestimated BID's. Conversely, male nonathletes (n=7; 14.6%, N=48) who had underestimated BID's were significantly more potential/actual users of steroids compared to male nonathletes (n=4; 8.3%, N=48) that over-estimated. X^2 (1,1) = 4.16, $p<0.05$. Refer to Table 16, BID and athletes.

Being a female athlete who underestimated (n=1; 1.3%, N=80) or overestimated (n=13; 16.3%, N=80) had no affect on whether a female athlete was a potential/actual user. Similarly, being a female nonathlete who underestimated (n=0, N=76) or overestimated (n=10; 13.2%, N=76) had no affect on potential/actual use.

3.3 It was hypothesized that there would be a significant difference in the use of steroids between the BIDs of athletes (male and/or female) in weight related sports and athletes (male and/or female) in nonweight related sports.

Being a potential/actual user athlete in a weight related sport or in a nonweight related sport had no significant association whether athletes were underestimating or overestimating their BIDs. Ten males (13.5, N=74) underestimated and eleven (14.9%, N=74) over estimated. One male (11.1%, N=9) overestimated and was a potential/actual user in a nonweight related sport. Refer to Table 16.

Table 16

Body Image Distortion (BID) and Athletes							
		Under-estimated		Over-estimated		Responses	
		n	%	n	%	N	% N=440
Male athletes	potential/ actual users	15	10.1	22	14.8	149	34
	non-users	51	34.2	61	40.9		
Male non-athletes	potential/ actual users	7	14.6	4	8.3	48	11
	non-users	11	17.5	52	54		
Female athletes	potential/ actual users	1	1.3	13	16.3	80	8.2
	non-users	14	17.5	52	65		
Female non-athletes	potential/ actual users	0	0	10	13.2	76	17.3
	non- users	9	11.8	57	75		
Male athlete in weight related sport	potential/ actual user	10	13.5	11	14.9	74	16.8
	non-user	25	33.8	28	37.8		
Male athletes in a non-weight related sport	potential/ actual user	0	0	1	11.1	9	2
	non-user	5	55.6	3	33.3		
Female athletes in weight related sport	potential/ actual user	0	0	0	0	2	0.4
	non-user	0	0	2	100		
Female athletes in non-weight related sport	potential/ actual user	0	0	0	0	16	3.6
	non-user	4	25	12	75		

Grade/Age Of Subjects

4. It was hypothesized that there would be a significant difference in the use of steroids between junior grades (9-10) and senior grades (11,12,0AC).

One hundred and sixty six (41.8%, N=399) students reported they were in a junior grade (grades 9 and 10) and two hundred and thirty one (58.2%, N=399) students reported they were in a senior grade (grades 11,12 and 13). Refer to Table 3, Subject characteristics.

Table 17, Grade of students by potential/actual use show that 24 (30.8%, N=78) junior (9,10) students and fifty four (69.2%, N=78) seniors (11,12,13) students were potential/actual steroid users. Senior (n=54; 69.2%, N=78) students reported significantly higher potential/actual users of steroids than junior (n=24, 30.8%, N=78) students X^2 (1,1) = 4.87, $p<0.05$.

Senior male students (n=39; 50%, N=78) reported more potential/actual user than male (n=14; 17.9, N=78) junior students X^2 (1,1) = 6.88, $p<0.01$. Senior females (n=15; 19.3, N=78) reported somewhat more potential/actual use than junior females (n=10; 12.8%, N=78), however, this difference was not significant. Comparing male and female students, senior males (n=39; 50%, N=78) reported greater potential/actual use of steroids than any other population of students (male juniors n=14; 17.9%, N=78; female juniors n=10; 12.8%, N=78; female seniors n=15; 19.3%, N=78). In terms of actual grades and overall use, for males there is

Table 17

Grade of Students by Potential/ Actual Steroid Use					
Sex	Users (N)	Junior grades (9,10)		Senior grades (11,12,13)	
		n	% N=78	n	% N=78
m/f	78	24	30.8	54	69.2
m	51	14	17.9	39	50
f	25	10	12.8	15	19.3

Grade of Students by Potential/ *i*. tual Steroid Use												
Sex	users		grade 9		grade 10		grade 11		grade 12		grade 13	
	n	%	n	%	n	%	n	%	n	%	n	%
m/f	76	17.3	110	2.5	14	3.5	19	4.8	22	5.5	13	3.3
m	51	11.6	4	7	9	17.6	14	27.	15	29.4	9	17.6
f	25	5.7	6	24	4	16	4	16	7	28	4	16

a general increase in use from Grade 9 through 12 followed by a drop off in Grade 13. Female potential/actual use is higher in Grades 9 and 12. Refer to Table 17.

4.1 It was hypothesized that there would be a significant difference in the use of steroids between athletes (male and/or female) and nonathletes (male and/or female) in junior and senior grades.

Senior male athletes (n=32; 20.6%, N=155) reported significantly more potential/actual use of steroids than junior male athletes (n=6, 3.9% N=155) X^2 (1,1) = 7.58, $p<0.05$. Potential/actual use of steroids is similar among male nonathletes in a junior (n=6; 11.8%, N=51) or senior (n=5; 9.8%, N=51) grade. Refer to Table 18, Grade of Athletes/Nonathletes and Potential/Actual Steroid Use and Nonuse.

No significant difference was noted between female athletes who were potential/actual users in either a junior (n=7; 8%, N=87) or senior (n=7; 8%, N=87) grade. Similarly, no significant difference was observed between female nonathlete potential/actual users in either a junior (n=3; 3.6%, N=84) or senior (n=8; 9.5%, N=84) grade.

Overall, potential/actual use of steroids was higher in senior male athletes (n=32; 20.6, N=155) than any other student athletes (male athletes junior n=6; 3.9%, N=155, female athletes junior n=7; 8%, N=87, and female athletes senior n=7; 8%, N=87). An ANOVA revealed that the age of subjects did not distinguish between students who were potential/actual steroid users.

Table 18

Grade of Athletes/Non Athletes and Potential/Actual Steroid Use and Nonuse							
Group	Use	Junior		Senior		Responses	
		n	%	n	%	N	% N=440
Male athletes	potential/ actual user	6	3.9	32	20.6	155	35.2
	non-user	47	30.3	70	45.2		
Male non-athletes	potential/ actual user	6	11.8	5	9.8	51	11.6
	non-user	32	36.8	41	47.1		
Female athletes	potential/ actual user	7	8	7	8	87	19.8
	non-user	32	36.8	41	47.1		
Female non-athletes	potential/ actual user	3	3.6	8	9.5	84	19.1
	non-user	31	36.9	42	50		

Location

5. It was hypothesized that there would be a significant difference in the use of steroids between rural and urban students.

Table 19 summarizes school location (urban vs rural) and potential/actual steroid use. Seventy eight (19.5%, N=399) students from urban (n=46; 12%, N=399) and rural (n=30; 7.5%, N=399) schools reported they were potential/actual users. A chi-square revealed no significant differences between potential/actual use (N=76) and school location (urban n=46, 12%, N=399; rural n=30, 7.5%, N=399).

There was no significant difference between male potential/actual use in urban (n= 33; 15.6%, N=211) or rural (n=18; 8.5%, N=211) schools. Similarly, school location did not significantly distinguish female potential/actual use (urban n=13; 7.5%, N=174; rural n=12; 6.9%, N=174). There was no significant difference between potential/actual use by athletes (urban n=36; 14.2%, N=254; rural n=18; 7.1%, N=254) or nonathletes (urban n=12; 8.8%, N=137; rural n=10; 7.3%, N=137) based on school location.

Beliefs about steroids (amount of medical/health risk associated with steroids - steroids help with speed - steroids build muscle strength).

As reported in Table 20, Medical/health risk of steroids, students (N=412) knew of some type of medical/health risk associated with steroids use. The two

Table 19

School Location (urban vs. rural) and Potential/Actual Steroid Use									
		Frequency		Urban		Rural		Responses	
		n	%	n	%	n	%	N	% N=440
Potential/ actual users (p/a user)		76	19.5	46	12	30	7.5	399	90
Male	p/a user	51	24.2	33	15.6	18	8.5	211	48
	non-users	160	75.8	99	46.9	61	28.9		
Female	p/a users	25	14.4	13	7.5	12	6.9	174	39.5
	non-users	149	85.6	77	44.3	72	41.4		
Athletes	p/a users	54	21.3	36	14.2	18	7.1	254	57.7
	non-users	200	78.7	111	43.7	89	35		
Non-athletes	p/a users	22	16.1	12	8.8	10	7.3	137	31.1
	non-users	115	83.9	63	46	52	38		

Table 20

Medical/Health Risks of Steroids		
Risk	Total population N=440	
	Frequency	Percentage (%)
Physiological	108	26.2
Diseases/brain cancer	119	28.9
Sexual changes	66	16
Psychological changes	15	3.6
Don't care	20	4.9
Death	44	10.7
Addiction	14	3.4
Serious side effects	25	6.1
Illness	1	0.2

most widely reported sources of information for students were television (43.1%) and a friend (37.9%) as outlined in Table 21 Sources of Information About Steroids. Other frequently sited sources were teachers (30.3%), muscle magazines (26.6%), doctors (21%) and coaches (13.9%).

Students (384; 87.3%, N=440) were aware of the use of steroids by professional athletes as shown in Table 22, Percentage of Professional Athletes that use steroids. Two hundred and fifty two (65.%, N=384) believed 50% or less of professional athletes were using steroids, while 97 (25.3%, N=384) believed 50% to 75% of professional athletes were using steroids, and 35 (9.1%, N=384) believed 75% to 100% of professional athletes were using steroids.

6. It was hypothesized that there would be a significant difference in the belief about of steroids between males and females.

A MANOVA showed that there was a significant difference in the beliefs about steroids between males and females $F(3,383) = 12.95$ $p<.001$. Three univariate analysis revealed the following about the beliefs of steroids by sex:

1) females ($\bar{X}$ 6.3, SD 1.0) believed steroids are significantly more risky to one's health than males ($\bar{X}$ 6.0, SD=1.3) $F(1,385)=5.44$ $p<.05$;

2) males ($\bar{X}$ 5.2, SD=1.7) believe steroids help build significantly more muscle strength than females ($\bar{X}$ 4.21, SD=1.58) $F(1,385)= 35.67$ $p<.001$; and

3) males ($\bar{X}$ 4.88, SD=1.83) believed steroids significantly

Table 21

Source of Information About Steroids				
Variable	Frequency	%	Responses	% N=440
Friend	164	37.9	433	98.4
Teammate	37	8.5	433	98.4
Coach	60	13.9	433	98.4
Teacher	131	30.3	433	98.4
Television	176	43.1	408	92.7
Muscle magazines	115	26.6	433	98.4
Doctor	89	21.0	423	98.4
Other	73	17	429	97.5

Table 22

Percentage of Professional Athletes that Use Steroids								
	Percentage of professional athletes that use steroids							
	1-50		50-75		75-100		Responses	
	n	%	n	%	n	%	N	% N=440
m/f	252	65.6	97	25.3	35	9.1	384	87.3
m	139	65.9	54	25.6	18	8.5	211	47.9
f	113	65.3	43	24.9	17	9.8	173	39.4

help with speed more than females ($\bar{X}$ 4.3, SD=1.58) $F(1,385)= 11.38$ $p= .001$.

6.1 It was hypothesized that there would be a significant difference in the belief about of steroids between athletes and nonathletes.

A MANOVA indicated that was a significant difference in the beliefs of steroids between athletes and nonathletes $F(3,390)= 11.21$ $p<.001$. Univariate analyses showed the following about the beliefs of steroids and athletes/nonathletes:

1) both athletes ($\bar{X}$ 6.1, SD=1.22) and nonathletes ($\bar{X}$ 6.3, SD= 1.12) equally believe steroids are risky to one's health;

2) athletes ($\bar{X}$ 5.07, SD=1.63) believed that steroids help build significantly muscle strength than nonathletes ($\bar{X}$ 4.22, SD=1.6) $F(1,392)= 25.17$ $p<.001$; and

3) athletes ($\bar{X}$ 4.9, SD=1.71) believe that steroids significantly help with speed than nonathletes ($\bar{X}$ 3.98, SD=1.81) $F(1,392)= 25.68$ $p<.001$.

Thoughts, enquiry and the ease of obtaining steroids.

7. It was hypothesized that there would be a significant difference in the thought, enquiry and the ease of obtaining steroids between males and females.

An MANOVA revealed that there was a significant difference in the amount of thought, enquiry, and the perceived ease of obtaining steroids between males and females $F(3,378)= 21.24$ $p<.001$. Univariate analyses revealed the following:

1) males ($\bar{X}$ 2.28, SD=1.61) have thought significantly more about using steroids than females ($\bar{X}$ 1.22, SD=.77) F(1,380)= 62.12 p<.001;

2) males have enquired ($\bar{X}$ 1.67, SD=1.32) significantly more about steroids than females ($\bar{X}$ 1.16, SD .62) F(1,380)= 21.66 p<.001; and

3) males ($\bar{X}$ 4.75, SD 2.16) think it is easier to obtain steroids than females ($\bar{X}$ 4.02, SD=2.15) F(1,380)= 10.83 p=.001.

7.1 It was hypothesized that there would be a significant difference in the thought, enquiry and the ease of obtaining steroids between athletes and nonathletes.

A MANOVA showed that the amount of thought, enquiry and the ease of obtaining steroids between athletes and nonathletes was significantly different F(3,385)= 7.40 p<.001. Univariate analyses revealed the following about the amount of though, enquiry, and the ease of obtaining steroids between athletes and nonathletes:

1) athletes ($\bar{X}$ 1.434, SD=1.5) have thought significantly more about steroids than nonathletes ($\bar{X}$ 1.43, SD=1.07) F(1,387)= 15.50 p<.001;

2) athletes ($\bar{X}$ 1.5, SD=1.18) have equally enquired about steroids as nonathletes ($\bar{X}$ 1.32, SD=1.03); and

3) athletes ($\bar{X}$ 4.68, SD=2.19) think it is significantly easier to get steroids than nonathletes ($\bar{X}$ 3.95, SD=2.11) F(1,387)= 10.01 p<.05.

Summary of Actual Users

Due to the small population of actual users of steroids, 1.8% of total sample, the summary will only provide limited information to protect the identity of those individuals. It is the belief of the researcher that the identity of these subjects could be obtained easily through detailed information (e.g. location of school, grade, sport played and body build).

There were 7 males and 1 female who reported actual use of steroids. The mean age of these subjects was 17.62 (SD 1.30). Users were mostly in the senior grades of 11 through 13 while only one was in a junior grade.

Three of the users were athletes and five were nonathletes. Two athletes participated in a weight related sport. All three athletes used steroids for sports compared to the four nonathletes who used steroids for muscle development/appearance.

Four subjects had a friend suggest to them to use steroids. Suggestion for the use of steroids also came from the following individuals: a teammate (n=2), physician (n=1), parent (n=1) and a coach (n=1). Information about steroids came from a friend (n=5), teammate (n=2), coach (n=2), teacher (n=2), television (n=3), muscle magazines (n=3), a physician (n=3) and some other (n=4) individual.

Four users reported they had 4 or more friends that used steroids. All four reported their friends used

steroids for sports. Five users reported some type of medical/health risk associated with steroids. Four users reported steroids caused some type of sexual changes to the body and one user reported steroids caused brain cancer.

Three users used oral steroids, only 1 of the 3 oral users reported the specific steroid used, which was G.H. Complex. Four users used an injectable steroid. Again only 1 reported the type used, which was Uni-Bol [used for race horses]. The steroids were obtained from two sources: friends (n=4) and an other (n=2) individual.

CHAPTER IV

DISCUSSION

Males and Females

This study showed the ratio of male/female potential/actual steroid use to be almost 2 to 1 (24.1% and 14.3% respectively). Since males reported more potential/actual use, then it seems logical that males have enquired and perceived it as easier to get steroids than females. It can be concluded that males are more likely to be potential/actual users of steroids than females, and it is also apparent that steroid use in Southwestern Ontario is predominantly a male phenomenon. The findings of this study reported eight actual users, 7 (1.6%) males and 1 (.2%) female. This is consistent with existing literature (Anderson et al., 1991). Terney and McLain (1990) reported males (6.5%) more than two times the number of male steroid users than females (2.5%). The ARF (1989-91) also reported that there were significantly more male (2.1%) users of steroids than females (.2%). McFarland (1991) found that four times as many males as females have used steroids.

It is interesting to note that actual users reported they obtained steroids from a friend(s) or some 'other' individual. Since steroids can only be obtained legally from a physician (Rubin,1990), this finding suggests that

students are acquiring steroids through the 'Black Market'. Not only are students obtaining steroids illegally but they may be using steroids that are impure and/or counterfeited. One actual user reported having used a steroid for race horses (Uni - Bol). It is apparent that students are resorting to any means to obtain steroids and are willing to use a steroid that is not intended for human use. The reported use of a steroid not intended for human consumption clearly demonstrates that students lack the knowledge of the use and appropriate dosages for these drugs (i.e. the dosage for a horse vs a human).

Students (N=151) reported they had a friend(s) that used steroids. Males had more friends that used steroids than females. Again it appears that more males then females are users of steroids. Future research should address the gender of the steroid using friends to allow greater insight into the actual use of steroids by both sexes.

Researchers, Terney and McLain (1990) and Krowchuk et al. (1989), have suggested that students are more apt to report someone other (e.g. a friend) than themselves as a steroid user. If this suggestion [reporting others as steroid users] were applied to this study, it would suggest that the actual use of steroids is higher (n=151) than reported (n=8). It must be noted, however, that this actual number may be appreciably lower than 151 due to the fact that some reported users may have been known to a number of

the respondents, and therefore have been counted a number of times. If future research is to explore the gender of friends, as noted above, an investigation to identify the friend may also provide further insight. A respondent could provide both the gender and initials of the friend(s) who uses steroids. The use of initials to identify the friend(s) who uses steroids would prevent the user (friends) from being counted several times.

Friends and teammates were the primary sources of suggestion of steroids use to students. In this study one parent had suggested the use of steroids to his/her child, while three students had a physician suggest they use steroids. Also, two students reported that a coach(es) had suggested they use steroids. It is interesting to note that those individuals who should be most concerned about the welfare of the students were suggesting to them that they use steroids, a potentially huge health risk.

Nine students had reported that some 'other' individual had suggested that they use steroids. Others might possibly include strangers or even possible dealers of steroids. Future studies should address the identity of the 'others'.

Senior males and senior females reported themselves as potential/actual users more so than any other grades. On the other hand, the age of students did not distinguish potential/actual steroid use. Age may not have had any significance on potential/actual steroid use because in

secondary school [in Ontario] students often take courses ahead of their year of actual enrolment. For example, a grade 11 student may have been surveyed in a grade 13 (OAC) geography class. It could be concluded that students in the same class may share similar interest, therefore no link established between age and potential/actual steroid use. The finding that age does not distinguish potential/actual steroid use is consistent with the finding published by the ARF (1989-91). The ARF (1989-91) reported that use of steroids was evenly distributed among ages of high school students.

A literature review failed to uncover any studies of high school students asked to identify the type of risk (e.g. loss of hair) associated with steroids. The types of medical/health risk reported by students in this study were consistent with the list of side effects (risk) presented in Table 2 and Appendix A. Students in this study most frequently reported the disease of brain cancer as a frequent risk associated with steroids. One week prior to this investigation, a former N.F.L (National Football League) player and actor Lyle Alzado had died of brain cancer. He and others believed steroids had caused his brain cancer. It could be concluded that the death of this football player/actor had an effect on the response of students in terms of the perceived risk associated with steroids. The death of this football player/actor may have

also influenced the source from which students obtained their information about steroids. A variety of media sources (e.g., television, newspapers and sport magazines etc.) exposed Alzado's brain cancer, death, and previous abuse of steroids to the world.

Television was the most frequently reported source of information about steroids for students, and friends were second. Terney and McLain (1990) also reported television as the primary source of information reported by their subjects. It could be concluded that students were receiving much of their information about steroids from television and friends rather than sources that are generally more reliable and better informed on steroids (e.g. doctors, health professionals and teachers).

Athletes and Nonathletes

Overall, athletes reported more potential/actual use of steroids than nonathletes. There were significantly more male athletes potential/actual users of steroids then male nonathletes, female athletes and female nonathletes. This finding is consistent with previous literature on athletes/nonathletes and steroid use (cf. Terney and McLain, 1990 and Windsor and Dumitru,1989).

Senior athletes (male and females) reported more potential/actual use of steroids than senior nonathletes

(males and females), junior athletes (male and female) and junior nonathletes (males and females). Since athletes and seniors have been the potential/actual users of steroids and steroids are considered a predominantly a male phenomenon, this finding is consistent with literature (cf. Anderson et al. 1991; Terney and McLain,1990; and McFarland, 1990: and Windsor and Dumitru,1989).

Male athletes in a weight related sport reported significantly more potential/actual user of steroids than females in a weight related sport, and male and female athletes in nonweight related sport. The classification of sports into weight related versus nonweight related provided little opportunity for females to be classified into a weight sport. The vast majority of weight related sports (e.g., football and wrestling) are played mostly by males. The classification of two types of sports (weight vs nonweight) showed that the potential/actual use of steroids occurred mainly in a weight related sport. It was interesting to discover that student athletes who had considered a career as a professional athlete did not report significantly more potential/actual steroid use; than student athletes who had not considered such a career.

Purpose of Use

Previous research indicates the use of steroids by high

school students is for two purposes: "First, to enhance athletic performances in 'win - at - all cost' competition. Second, to enhance appearance" (McFarland,1990,p.12). Findings in this study were consistent with the literature (McFarland,1990) indicating the purpose behind potential/actual steroid use. Students reported potential/actual steroid use for both muscular development/appearance and sports. However, the potential/actual use of steroids by students was centred on students improving their 'cosmetics' rather than students obtaining an 'edge' in an athletic performance.

There was a significant difference between the Body Image Distortion's (BID) of males and females. Females significantly overestimated their BID's compared to males. Unlike other studies (cf. Ford,1991 and Keith,1991) male students in this study overestimated their BID's as well, although to a lesser extent than females. It is interesting to note that none of the students surveyed reported normal (0%) BID scores.

Findings showed that males who underestimated were potential/actual users while females who had overestimated were potential/actual users of steroids. Studies have indicated that 1) males consider the mesomorphic body build as the ideal body build (Chung and Moore,1991; Loosemore and Moriarty,1990; Mintz and Bentz,1986; Fallon and Rozin,1985; and Learner and Korn,1972), 2) perceive themselves

underweight (Ford,1991 and Keith,1991), and 3) wish to gain weight (Rosen and Gross,1987). The male students surveyed also reported the mesomorphic body build as the ideal (preferred) body build. The potential/actual use of steroids by male underestimators may prompt male students to use steroids in pursuit of their desires to gain weight for a mesomorphic build.

Several authors indicated that steroids do build muscle mass (cf. Phillips,1989; Haupt and Rovere,1984; and OSAP,1979). Therefore, it is surprising to find female students who overestimated their BID's to be potential/actual users of steroids. Studies have clearly demonstrated that females express different desires than males regarding body shape and size. In general females wish to lose weight while males want to gain weight (cf. Keith,1990 and Ford,1991). It could be speculated that female students who overestimated would use steroids to create a leaner body mass (e.g., a loss in body fat), therefore creating an illusion that they have lost weight.

Athletes (male and female) who reported underestimated and overestimated BIDs were potential/actual steroid users. The similarities of the BIDs (underestimation and/or overestimation) reported by athletes (male and female) and female nonathletes who were potential/actual steroid users could be attributed to the large percentage of potential/actual use of steroids for cosmetic purposes.

Findings indicated that male nonathletes who underestimated reported significantly higher potential/actual use than male nonathletes who overestimated. It could be argued that male nonathletes who had underestimated were potential/actual users attempting to gain weight to fulfil their desires for a mesomorphic build.

Analysis of athletes in a weight related sport showed that their underestimation or overestimation of their BID's did not correlate with potential/actual steroid use. As well, all potential/actual steroid user athletes in a weight related sport were male. Potential/actual steroid use by male athletes who participate in a weight related sport is centred on cosmetics rather than athletic performance according to their response on this [purpose of use] question.

Location of School

A review of literature failed to reveal any study that compared the incidence of steroid use by students in rural and urban schools. Studies on the use of steroids by high school students appeared to be conducted on convenient samples, urban centres (cf. Anderson et al.,1991, Terney and McLain,1990 and Krowchuk et al.,1989, and ARF, 1989-91). It was noted in this current study that school location did not distinguish the potential/actual use of steroids by

students. The similarity of potential/actual use of steroids by rural and urban students could be attributed to proximity of the rural schools to urban centres. The furthest rural school surveyed was approximately 30 miles from an urban centre. The term 'rural' in this case may be misleading and the use of suburban might have been more appropriate.

Conclusion and Recommendations

This study revealed that there is an incidence of [potential/actual] steroid use by secondary school students in South Western Ontario. One of the objectives of this study was to provide officials, teachers and coaches in the secondary schools with an understanding as to why and in which students steroid use has occurred, or may occur, and to aid in the justification for the development of a preventive programs to reduce steroid use by high school students. It became apparent that sociocultural attitudes in regards to [male] students underestimation of body size and [female] overestimation of body size greatly influenced the [potential/actual] use of steroids by students. Students (male or female) reported the primary purpose of [potential/actual] steroid use was to improve their body build and/or appearance. Even the respondents (male or female) that were athletes had [potential/actual] used steroids to improve their appearance more so than their

athletic performances.

In order for officials, educators and coaches to manage the use of steroids by students the following recommendations are made:

1) Physical and health educators should include in their curriculum discussion and information sessions that addresses the relationship of self worth and body builds. The discussion and information sessions will enable students to appreciate themselves for who they are and what they look like. The goal of this intervention would be to deter students from resorting to unhealthy means (e.g. steroid use or eating disorders) of altering their bodies to fullfil sociocultural expectations of behaviour in today's society.

2) Secondary schools could also set up counselling and support/peer groups in conjunction with discussion and information sessions. The counselling and support/peer groups could act as referral programs for all students and not just students enrolled in physical and health educational classes. Educational programs could provide students with ways to cope with their current dissatisfactions about their bodies. Such programs could also provide information to student such as how to create their ideal body build by utilizing healthier and safer measures (e.g., exercise programs, weight gaining/losing regimes etc.) rather than riskier, unsafe practices (e.g., steroid use).

3) Since steroids are risky to one's health and steroids are being used by high school students, random testing for steroids could be implemented. It may not be feasible to test the general populations of students but it may be feasible to test the athletic population during athletic competitions. Since male student athletes are the most frequent [potential/actual] users of steroids, as revealed in this study and other studies, they seem the most logical population to target for steroid testing and preventive educational programs.

Future Research

Future research reporting the use of steroids by students could involve the following:

1) Investigations in other Canadian cities to determine if the findings in Southwestern Ontario are comparable to other regions in Canada.

2) A comparative study of steroid use between high school students in a Canadian city and an American city.

3) An investigation should be conducted on the knowledge officials, teachers and coaches have about steroids and steroid use. Knowledge could include how much these individuals know about steroids (e.g., the risk associated with steroids, types of steroids, and signs of steroid use, etc.). A study of this nature would justify curriculum development, professional development days, workshops and conferences, devoted to the problem of steroid use by

students.

4) A future study could explore when the use of steroids occurred. For example an investigation to determine if the use and considered use of steroids occurred prior to students entering high school (i.e., primary school). Even a comparison study involving the use of steroids between primary school students and high school students could be conducted.

5) A study could also explored steroid use in terms of drug abuse and dependency within the student population(s).

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Appendix A

Adverse Effects of Steroids

-Stunting of Growth in Children

-Changes in Blood Lipids (a depression in the chemical high density lipoprotein and an increase in the chemical low density lipoprotein)

-Adverse Psychological Effects (increase in aggressive behaviour, termed 'roid range')

-Effects on Sexual Characteristics

Females
- increased facial and body hair
- acne
- deepening of the voice
- male pattern baldness
- enlarged clitoris
- reduced breast size
- changes in libido
- masculine musculature
- suppression of menstruation and ovulation
- infertility

Males
- testicular atrophy
- suppressed sperm production
- infertility
- breast enlargement (gynecomastia)

-Impaired Liver Function (benign and malignant tumours)

-Effect on Body Fluids (increase in blood and extracellular fluid)

-Other Effects (caused by sharing of needles, e.g. HIV)

(Dubin 1990,p.105-107)

Appendix B

Questionnaire for Males

Read each question carefully and answer as completely as possible. Please NOTE that some questions can be answered only if you answer the previous question with a positive or "yes", answer. In some cases, you will be instructed which question should be answered next, depending on a particular answer.

This questionnaire is anonymous. DO NOT put your name on it. The answers are confidential. The completed questionnaire will not be seen by any teacher or staff from this school and will be coded for analysis by the researcher. We want to thank you very much for participation in this survey.

PART A.

1. Age? ___

2. Grade? ___

3. Sex? Male ___ Female ___

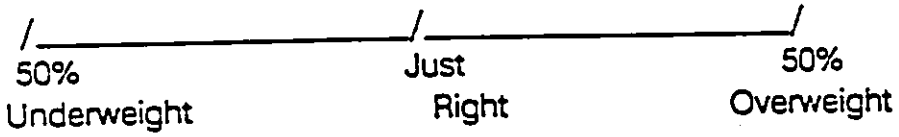
4. Height? ___ inches or ___ centimetres

5. Weight? ___ pounds or ___ kilograms

6. What body size do you have?
   Small ___ Medium ___ Large ___

7. On the line below, place an "X" at any point along the continuum that you feel describes your body size:

   (a)



8. i) Do you participate in any organized sports (e.g. inter-school sport and/or community amateur sport)? yes___ no___ If "yes" please list the organized sport(s) in which you participate and also, place the first letter of the level at which you participate beside the sport(s), using the following letters: B= Beginner, I= Intermediate, A= Advance and, E= Elite.

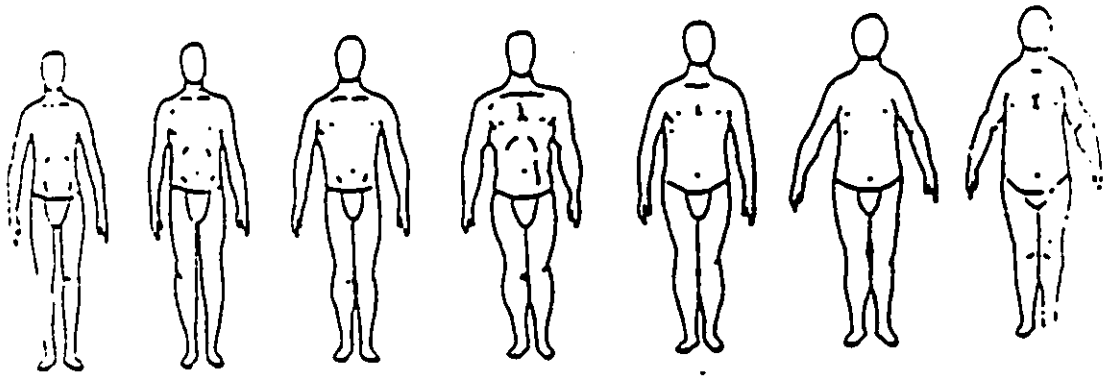
Sport:	Level:	Sport:	Level:
_____	___	_____	___
_____	___	_____	___

ii) Please list the physical activities you participate in.

Activity:	Times/Week	How Long at each activity(s)?
_____	___	___
_____	___	___
_____	___	___

9. (a) Rank the following types from 1 (most preferred) to 7(least preferred). Place your ratings (1, 2, 3, 4, 5, 6, 7) in the blanks provided under each body type. Please rate each body type and don't give the same rating (e.g. 1) more than once.

(b) Now look at the body types again and place an "X" above the drawing of the body type which you feel is most like your own.



___ ___ ___ ___ ___ ___ ___

Tanner (1984)

PART B.

1. How many times have you seen a physician during the past year? ___

2. How many injuries have you had that required medical attention during the past year? ___

3. How often has a physician or any medical personnel prescribed a medicine(s) for a sports-related injury during the past year? ____

4. Has a member of the school's coaching staff or any teacher ever given you any medication for a sport injury?

   yes ___ no ___

   If "yes" How often? ___ What Kind(s)?

   _____

   _____

5. Has a friend, teammate, physician, parent, coach, teacher or any other individual ever suggested that you use steroids?
   yes ___ no___

   If yes, who?
   Friend ___ Teammate ___ Physician ___ Parent ___
   Coach ___ Teacher ___ Other ___

6. How risky do you think it is to your health to use steroids?

Not At All Risky						Very Risky
1	2	3	4	5	6	7

7. What are the medical and health risks of steroids?

   _____

8. Would you consider using steroids, if you thought they would help you? yes ___ no ___ If "yes" how would they help you?

   _____

9. (a) How many people do you know among your friends that use steroids? ___

(b) For what purpose do they use steroids?:

_____

10. How often have you thought of using steroids?

Never Often

1 2 3 4 5 6 7

11. Have you ever enquired about using steroids?

Never Often

1 2 3 4 5 6 7

12. (a) Have you ever tried steroids? yes ___ no___
If "yes" How many times? ___ :oral ___ injectable ___ or both ___

(b) If "regular use" please complete the following.

	Times/Week	Times/Month	Years of use
Oral:	___	___	___
Injectable:	___	___	___

(c) Are you currently using steroids? yes ___ no ___
If "yes" oral ___ injectable ___ or both ___

	Times/Week	Times/Month	Name of Steroid(s) and dose taken
Oral:	___	___	_____
	___	___	_____
Injectable:	___	___	_____
	___	___	_____

(d) Where did you obtain the steroids?
Friend ___ Teammate ___ Physician ___ Parent ___
Coach ___ Teacher ___ Other ___

(e) Why do you use steroids?

_____

13. Have you ever considered a career as a professional athlete?
yes ___ no ___
If "yes" what sport? _____

14. What percentage of professional athletes do you think use steroids? ___%

15. Do you believe that steroids really do build up muscle strength?

Not at All						A Great Deal
1	2	3	4	5	6	7

16. Do you believe that steroids really do help with speed?

Not at All						A Great Deal
1	2	3	4	5	6	7

17. How easy would it be for you to obtain steroids if you wanted them?

Difficult						Very Easy
1	2	3	4	5	6	7

18. Where do you get your information about steroids?
Friend ___ Teammate ___ Coach ___ Teacher ___
Television ___ "Muscle" magazines ___ Doctor(s) ___
Other ___

THIS ENDS THE QUESTIONNAIRE. AFTER RECHECKING TO MAKE SURE YOU HAVE ANSWERED ALL THE QUESTIONS, PLEASE PLACE THE QUESTIONNAIRE IN THE ENVELOPE PROVIDED AND PLACE IT IN THE BOX LOCATED AT THE BACK OF THE ROOM. AGAIN - THANK YOU.

Appendix C

Questionnaire for Females

Read each question carefully and answer as completely as possible. Please NOTE that some questions can be answered only if you answer the previous question with a positive or "yes", answer. In some cases, you will be instructed which question should be answered next, depending on a particular answer.

This questionnaire is anonymous. DO NOT put your name on it. The answers are confidential. The completed questionnaire will not be seen by any teacher or staff from this school and will be coded for analysis by the researcher. We want to thank you very much for participation in this survey.

PART A.

1. Age? ___

2. Grade? ___

3. Sex? Male ___ Female ___

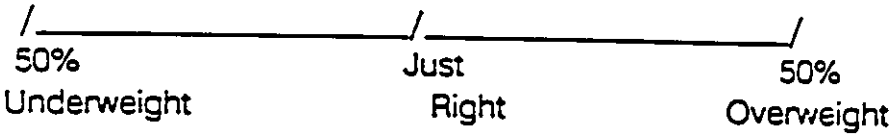
4. Height? ___ inches or ___ centimetres

5. Weight? ___ pounds or ___ kilograms

6. What body size do you have?
   Small ___ Medium ___ Large ___

7. On the line below, place an "X" at any point along the continuum that you feel describes your body size:

   (a)



8. i) Do you participate in any organized sports (e.g. inter-school sport and/or community amateur sport)? yes___ no___ If "yes" please list the organized sport(s) in which you participate and also, place the first letter of the level at which you participate beside the sport(s), using the following letters: B= Beginner, I= Intermediate, A= Advance and, E= Elite.

Sport:	Level:	Sport:	Level:
_____	___	_____	___
_____	___	_____	___

ii) Please list the physical activities you participate in.

Activity:	Times/Week	How Long at each activity(s)?
_____	___	___
_____	___	___
_____	___	___

9. (a) Rank the following types from 1 (most preferred) to 7(least preferred). Place your ratings (1, 2, 3, 4, 5, 6, 7) in the blanks provided under each body type. Please rate each body type and don't give the same rating (e.g. 1) more than once.

(b) Now look at the body types again and place an "X" above the drawing of the body type which you feel is most like your own.

___ ___ ___ ___ ___ ___ ___

Stunkard, Sorenson, and Schulsinger (1983)

PART B.

1. How many times have you seen a physician during the past year? ___

2. How many injuries have you had that required medical attention during the past year? ___

3. How often has a physician or any medical personnel prescribed a medicine(s) for a sports-related injury during the past year? ____

4. Has a member of the school's coaching staff or any teacher ever given you any medication for a sport injury?

   yes ___ no ___

   If "yes" How often? ___ What Kind(s)?

   _____

   _____

5. Has a friend, teammate, physician, parent, coach, teacher or any other individual ever suggested that you use steroids?
   yes ___ no___

   If yes, who?
   Friend ___ Teammate ___ Physician ___ Parent ___
   Coach ___ Teacher ___ Other ___

6. How risky do you think it is to your health to use steroids?

Not At All Risky						Very Risky
1	2	3	4	5	6	7

7. What are the medical and health risks of steroids?

   _____ _____

8. Would you consider using steroids, if you thought they would help you? yes ___ no ___ If "yes" how would they help you?

   _____

9. (a) How many people do you know among your friends that use steroids? ___

(b) For what purpose do they use steroids?:

_____

10. How often have you thought of using steroids?

Never Often

1 2 3 4 5 6 7

11. Have you ever enquired about using steroids?

Never Often

1 2 3 4 5 6 7

12. (a) Have you ever tried steroids? yes ___ no___
If "yes" How many times? ___ :oral ___ injectable ___ or both ___

(b) If "regular use" please complete the following.

	Times/Week	Times/Month	Years of use
Oral:	___	___	___
Injectable:	___	___	___

(c) Are you currently using steroids? yes ___ no ___
If "yes" oral ___ injectable ___ or both ___

	Times/Week	Times/Month	Name of Steroid(s) and dose taken
Oral:	___	___	_____
	___	___	_____
Injectable:	___	___	_____
	___	___	_____

(d) Where did you obtain the steroids?
Friend ___ Teammate ___ Physician ___ Parent ___
Coach ___ Teacher ___ Other ___

(e) Why do you use steroids?

_____

13. Have you ever considered a career as a professional athlete?
yes ___ no ___
If "yes" what sport? _____

14. What percentage of professional athletes do you think use steroids? ___%

15. Do you believe that steroids really do build up muscle strength?

Not at All						A Great Deal
1	2	3	4	5	6	7

16. Do you believe that steroids really do help with speed?

Not at All						A Great Deal
1	2	3	4	5	6	7

17. How easy would it be for you to obtain steroids if you wanted them?

Difficult						Very Easy
1	2	3	4	5	6	7

18. Where do you get your information about steroids?
Friend ___ Teammate ___ Coach ___ Teacher ___
Television ___ "Muscle" magazines ___ Doctor(s) ___
Other ___

THIS ENDS THE QUESTIONNAIRE. AFTER RECHECKING TO MAKE SURE YOU HAVE ANSWERED ALL THE QUESTIONS, PLEASE PLACE THE QUESTIONNAIRE IN THE ENVELOPE PROVIDED AND PLACE IT IN THE BOX LOCATED AT THE BACK OF THE ROOM. AGAIN - THANK YOU.

Appendix D

Sample Calculation for Body Size Distortion Questionnaire

Reported Weight = 185 pounds

Recorded Height = 73 inches

Ideal Midpoint = 180

Frame = Large

Perceived Weight Deviation (PDev) = The percentage that the subject feel he/she is above/below his/her midpoint, as measured by the BSDQ.

Actual Weight Deviation (ADev) = Actual weight (weight/ideal midpoint)°

BSDQ Formula:

$$\frac{PDev}{ADev} \quad -1 \times 100$$

$$\frac{104}{185/180} \quad -1 \times 100$$

$$= -9.73$$

Appendix E

1983 Metropolitan Height and Weight Tables: Midpoints				
Women				
Height		Body Frame		
		Small	Medium	Large
4	10	106.5	115.0	124.5
4	11	108.0	117.0	127.0
5	0	109.5	119.5	129.5
5	1	112.0	122.0	132.5
5	2	114.5	125.0	135.5
5	3	117.5	128.0	139.0
5	4	120.5	131.0	142.5
5	5	123.5	134.0	146.0
5	6	126.5	137.0	149.5
5	7	129.5	140.0	153.0
5	8	132.5	143.0	156.5
5	9	135.5	145.0	159.5
5	10	138.5	149.0	162.5
5	11	141.5	152.0	165.5
6	0	144.5	155.0	168.5

Appendix F

1983 Metropolitan Height and Weight Tables: Midpoints				
Men				
Height		Body Frame		
		Small	Medium	Large
5	2	131.0	136.0	144.0
5	3	133.0	138.0	146.5
5	4	135.0	140.0	149.0
5	5	137.0	142.5	152.0
5	6	139.0	145.0	155.0
5	7	141.5	148.0	158.5
5	8	144.0	151.0	162.0
5	9	146.5	154.0	165.5
5	10	149.0	157.0	160.0
5	11	151.5	160.0	172.5
6	0	154.5	163.5	176.0
6	1	158.0	167.0	180.0
6	2	161.5	171.0	184.5
6	3	165.0	174.5	189.0
6	4	169.0	179.0	194.0

Appendix G

CONSENT FORM

A study is being conducted by Mr Michael O'Neil and Dr. Dick Moriarty of the Faculty of Human Kinetics, University of Windsor. The purpose of this study is to find out, with your cooperation, how you feel about yourself and your body and the incidence of anabolic steroids use in high schools. Participation in this study involves a completion of a questionnaire. This will take about one-half hour.

When you agree to participate in this study, you will understand that:

1. Your participation in this study is voluntary. If you are not comfortable with this study, you may withdraw at anytime.

2. Your response to the questionnaire will be held in strictest confidence and will be use for research purposes only. The report of the study will involve a summary of group responses rather than individual answer.

3. At the end of completing the study, a debriefing with a complete explanation of the purpose and results of the study will be available.

YOUR NAME:_____

DATE OF BIRTH:_____ YOUR SIGNATURE_____

SIGNATURE OF PARENTS:_____
(as required by school policy)

****

This study has been reviewed and has received clearance through the Department of Kinesiology Ethics Committee. The office of Research Services will receive any complaints or concerns with regard to this study.

Human Ethics Committee, Department of Kinesiology, University of Windsor 253-4233, ext. 2444
Chair, Dr. K. Kenno

****

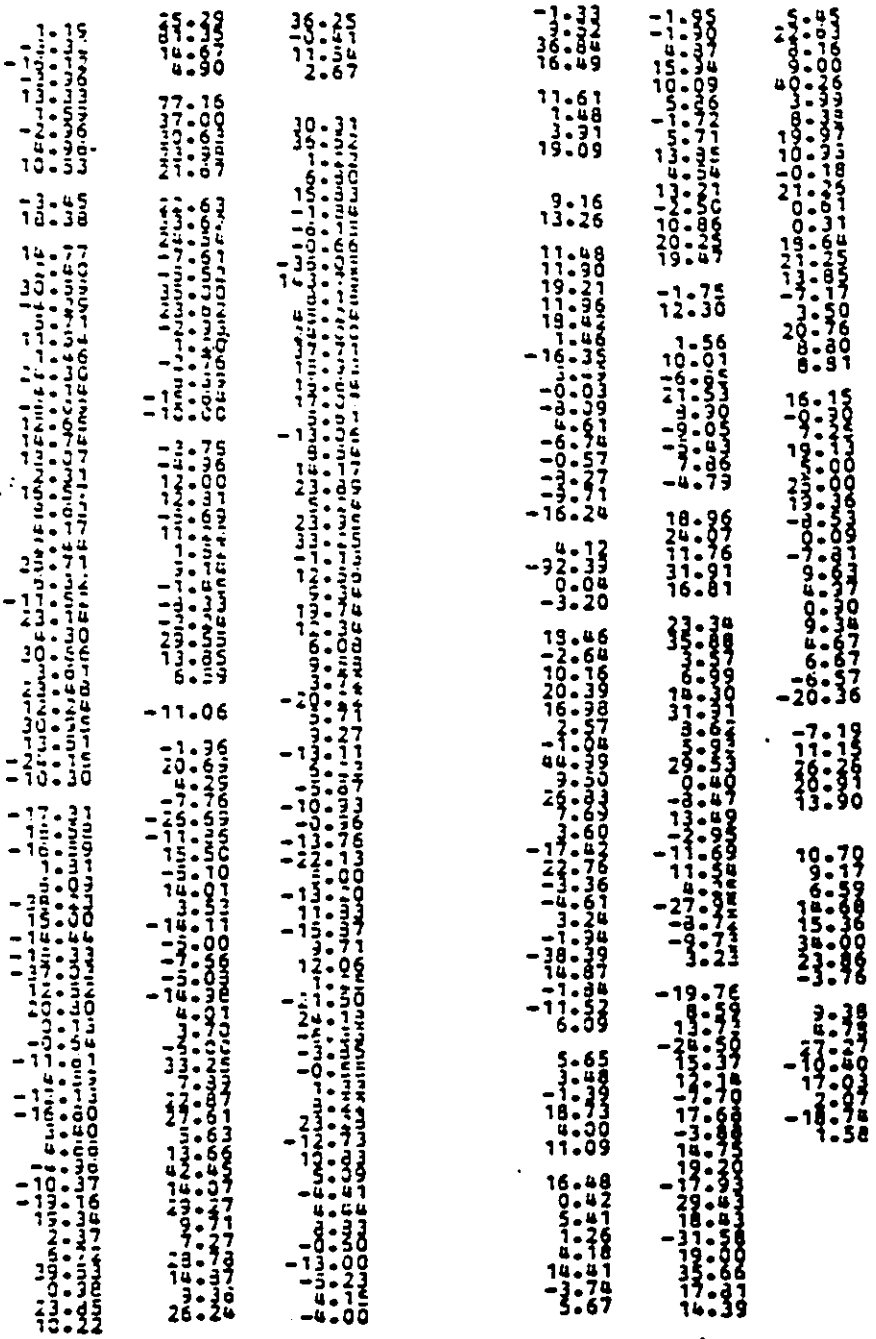
Appendix H

Means of Actual, Potential Users and Nonusers						
	Actual		Potential		Nonusers	
	$\bar{X}$	(SD)	$\bar{X}$	(SD)	$\bar{X}$	(SD)
Beliefs: amount of risk associated with steroids	4.3	(1.9)	5.4	(1.4)	6.3	(.98)
Beliefs: steroids help speed	5.3	(.92)*	5.2	(1.3)	4.4	(1.9)*
Beliefs: steroids help build muscle strength	6.3	(.92)*	5.7	(1.3)*	4.5	(1.7)

* denotes significantly different at the .05 level

Appendix I

EID Scores for Students



Vita Auctoris

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Birth:	Carleton Place, Ontario, Canada March 28, 1965
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