THE PSYCHOSOCIAL AND SITUATIONAL ANTECEDENTS OF ANABOLIC-ANDROGENIC STEROID USE: A PATH ANALYTIC APPROACH

By

Steven Geoffrey Simensky

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ABSTRACT

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In response to the lack of empirical knowledge on the antecedents of anabolic-androgenic steroid (AAS) use, the purpose of this study was to ascertain the psychosocial and situational variables which predispose males to consume these illicit drugs. One hundred and sixty-six weightlifters and 31 nonexercisers, recruited from 15 states and 1 Canadian province, were discriminated on perceived competency, body image, AAS-related, weightlifting-related, and physique-related variables. Results revealed that while individuals using AAS (AAS-Users) and individuals who had never used AAS but were contemplating their use (AAS-Contemplators) were much stronger and bigger than individuals who had never used and were not contemplating using AAS (AAS-Noncontemplators) and the control group, the AAS-Users and AAS-Contemplators possessed significantly more body image concerns (BIC), more positive attitudes towards AAS, and more peer and gym contextual pressure to gain muscle mass than the AAS-Noncontemplators. In addition, the AAS-Users and AAS-Contemplators perceived greater support from significant others to use AAS and were less likely to listen to significant others concerning AAS-use than the AAS-Noncontemplators. Elevated body image concerns appeared to play a significant role in these pro-AAS beliefs and attitudes as exploratory analyses on individuals with high levels of BIC revealed high BIC groups to possess similar pro-AAS sentiments. Path analyses revealed slightly different models for the intention to use AAS for the

first time and the intention to repeatedly use AAS. The intention to use AAS for the first-time was causally impacted by subjects' weightlifting dissatisfaction, desire to compete in a future weightlifting event, peer pressure to gain muscle mass, and the perceived ease in finding AAS. The intention to continue using AAS was also impacted by these aforementioned variables in addition to subjects' attitudes of AAS. While impacting AAS-intention, positive attitudes of AAS, in turn, were impacted by subjects' perceived short stature, perceived job incompetence, and perceived approval of significant others to use AAS. From these data, recommendations are made on how to improve future AAS-intervention and prevention programs. Suggestions for future research in this area are also provided.

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Chapter 1

INTRODUCTION AND REVIEW Of THE LITERATURE

Nature of the Problem

According to many reports, the nontherapeutic use of steroids has risen markedly since the 1950s (Buckley, Yesalis, Friedl, Anderson, Streit, & Wright, 1988; VanHelder, Kofman, & Tremblay, 1991; Yesalis, 1993). It has been estimated that over 1 million Americans (Taylor, 1987a), including as many as 700,000 to one million adolescents under the age of 18 (Buckley et al., 1988; Marshall, 1988), have been abusing these drugs to improve their athletic performance, appearance, fighting skills, and self-image (Brower, 1991). These increases have continued in spite of prevention and intervention programs erected to combat steroid use (Yesalis, Streit, Vicary, Friedl, Brannon, & Buckley, 1989).

The dramatic increase in steroid use coupled with its potent performance-enhancing and noxious side effects and the relative ineffectiveness of prevention programs have resulted in a plethora of research on these drugs. However, very little research has attempted to ascertain the psychosocial and situational variables which may predispose individuals to consume anabolic steroids. Understanding steroid-users' psychological needs and deficits as well as situational determinants are essential to any steroid prevention program as such information can help clinicians focus on the complexities of the target population. Most research has glossed over steroid-users' psychosocial needs, offering little insight as to why some individuals choose to use and others refrain from using steroids other than describing user-motivation in terms of gender, athletics, and appearance. Such a superficial profile fails to explain exactly why

some individuals choose to use steroids or become interested in experimenting with them while others, possessing similar physique and training goals, do not.

Purpose of the Study

Given past research's superficial profile of AAS-users and AAS-contemplators, the purpose of this study was to investigate the psychosocial and situational variables which may predispose individuals to initiate anabolic-androgenic steroid consumption. By analyzing steroid-using and nonusing weightlifters and a control group via multivariate and univariate statistical tests, a more thorough profile of potential and current AAS-users can be generated which can then be used to help improve upon future AAS-prevention and intervention strategies.

Incidence Rates and Effects of Steroid Use

More correctly referred to as anabolic-androgenic steroids (AAS) because of their dual tissue-building and masculinizing roles (Yonker et al., 1990), AAS have found a home in the athletic arena due to their professed ergogenic and restorative properties (Goldman & Klatz, 1992). Despite their widely reported physiological and psychological toxic effects, steroids' popularity has insidiously exploded into almost all sports and all age groups today.

The incidence of AAS-abuse in contemporary society reveals some horrifying statistics. Studies conducted by Toohey and colleagues on the incidence of AAS-use in high schools and colleges (e.g., Dezelsky, Toohey, & Shaw, 1985; Toohey, 1975, 1978; Toohey & Cox, 1971) revealed that 20% of intercollegiate athletes, fewer than 1% of nonathletes, and 2.5% of high school athletes had used these drugs. Later, in a study which brought national attention to AAS-abuse by adolescent males, Buckley et al. (1988) surveyed 6765, twelfth-grade males in 46 private and public high schools across the

United States. The researchers found that 226 of the 3403 participants (6.6%) who participated in the study reported having used AAS. In addition, these researchers found some other startling facts. Of the 226 participants who reported use, 38% reported having used AAS first at age 15 or younger and another 33% reported having used AAS first at age 16. Other researchers investigating teenage AAS-use have found incidence rates ranging from 4% (Yonker et al., 1990) to 18% (Polen, Schnider, & Sirotowitz, 1986) with the highest reported use among high school athletes spanning between 6% and 11% (Krowchuk, Anglin, Goodfellow, Stancin, Williams, & Zimet, 1989). Early incidence of AAS-use is especially noteworthy, as some researchers have found that the earlier individuals initiated AAS, the more likely they were to become "hardcore" users in the future (Yesalis et al., 1989) as well as users of the cheapest and most toxic forms of AAS (Yonker et al., 1990). Studies focusing on AAS-use in collegiate males found incidence ranges between 2% and 17% (Pope, Katz, & Champoux, 1988) with the highest consumption in athletes, especially Division I and II football players, who have been estimated to be in the 20-30% incidence range (Duda, 1985).

AAS-use among elite athletes is dramatic. As is widely known among most elite athletes, Ben Johnson's testing positive for the oral AAS stanozolol (Winstrol) in the 1988 Olympics and in a later track and field meet is the very tip of the AAS iceberg. While he is often castigated as a cheater among the pristine by the public, Johnson is readily acknowledged in the private inner circles among athletes and coaches in the sporting world as simply the fool who was dumb enough to get caught. While the media would like to portray Ben Johnson as the one bad apple of the sporting world, contemporary statistics of AAS-use among elite athletes support the notion of one rotten orchard. For

example, of the 45 elite powerlifters (out of 61) who responded to Yesalis, Herrick, Buckley, Friedl, Brannon, and Wright's (1988) survey at the US Powerlifting Championships, 55% admitted AAS-use. Veteran NFL players such as Pat Donovan (Cowboys), Fred Smerlas (Bills), Lyle Alzado (Raiders), Joe Klecko (Jets), Steve Courson (Steelers), Bill Fralic (Falcons), and Howie Long (Raiders) have estimated AAS-use within their league to range anywhere from 35% in the "small" guys to 90% in the "big" guys (Yesalis, Courson, & Wright, 1993).

The incidence of AAS-use in the sporting world remains staggeringly high in spite of their widely reported negative side effects. Research on AAS has indicated significant morbidity and mortality including cancer of the skin, liver, prostate and kidney, cardiovascular abnormalities (including accelerated atherosclerosis, myocardium hypertropy, increased low density lipoproteins, and high blood pressure), hyperinsulinimia, immunological disturbances, stroke, and sexual dysfunction (including impotence, shrinking of the testacles, and decreased sperm count) (Alen & Hakkinen, 1987; Alen & Rahkila, 1988; Brower, 1989, 1993a; Creagh, Rubin, & Evens, 1988; Goldman & Klatz, 1992; Wright & Stone, 1985). Other physiological side-effects include premature cessation of long-bone growth, hirsutism, acne, coarsening of the voice, hypertrophy of the clitoris, tendon, ligament, and muscle susceptibility to injury, and, in men, gynecomastia (female breast development) and male-pattern baldness (Brower, 1989, 1993a; Goldman & Klatz, 1992; Yonker et al., 1990).

Because the central nervous system is replete with androgen receptors, AAS are able to bind to these receptor sites in the brain causing psychogenic effects (Brower, 1993b). Extreme mood swings ranging from violent, homicidal rages (aka, "roid rage" or "steroid psychosis") and delusions of invincibility to

suicidal depression have all been noted in case studies of AAS-abuse (Brower, 1993a; Pope & Katz, 1988; Taylor, 1987b). In addition, recent hypotheses suggest that because of the multitude of androgen receptor sites in the brain, AAS may have organic bases for psychological addiction in ways similar to cocaine and heroin (Brower, 1991), although at present, research is inconclusive on this matter. In any event, psychological dependence to AAS has been noted in individuals who, despite suffering the negative side effects, continue to use these drugs in order to look and feel huge and strong. The epitome of AAS's addictive potential is Larry Pacifico, once an elite powerlifter and world record holder in a number of strength events, who confessed after recovering from a heart attack:

> "I'm convinced my steroid use contributed to my coronary artery disease. I'm certain of it, and so is my doctor. I should have realized it was happening,because every time I went on a cycle of heavy steroid use, I'd develop high blood pressure and my pulse rate would increase. Steroids aren't a part of my life now, but I'd be lying if I said I didn't miss them. And you know what? I may even take them again because I may not be able to keep myself from taking them" (p. 72, Todd, 1983).

One of the most astounding features about the widespread use of anabolic-androgenic steroids by teenagers and adults is that most contemporary users have a fairly accurate idea concerning the health hazards surrounding these drugs. In fact, Chng & Moore (1990) found that, despite knowledge of AAS toxicity, AAS-users had a more positive regard for these drugs than nonusers. It was found that nonusers held an unfavorable view of AAS, citing potential health hazards and their illegality as bases for this attitude. These findings leave open the question, if most nonusers have a relatively negative view of AAS, what leads some of them to eventually "experiment" with them? Of the many male ectomorphic and endomorphic weightlifters who are unsatisfied with their strength, physical prowess, and appearance, only a

relatively small percentage end up taking these drugs. What, then, differentiates users from potential users and staunch nonusers?

The answers to these questions may be found by studying the psychosocial and situational factors which may predispose individuals to contemplate using AAS. One variable which has shown some power in explaining and predicting all kinds of human behavior (Harter, 1978, 1986), including drug use, is an indiviudal's sense of competency (e.g., Wills, Vaccaro, & McNamara, 1992). Because Harter (1978, 1981) has established one of the most valid and reliable models of competence motivation, her model will be used to guide this investigation into these questions.

Because AAS-use is related to general drug use, eating disorders, and body image disturbance, this chapter will proceed by addressing the variables in each of these areas which are linked to perceived competency deficits. Towards the end of the chapter, these variables will be explored in the AAS literature.

Competence Motivation

Expanding upon White's (1959) premise that individuals are innately impelled towards competence, Harter (1978, 1981) asserts that individuals' perceived competence often varies in academic, social, and physical domains. Because most individuals do not feel equally competent in all of these domains as a result of varied outcome and reinforcement histories, most choose to concentrate on the one or two domains in which they have perceived the most success. The resulting feelings of competence are thought to give one a sense of control and joy in life that serves to further reinforce one's exploration of a particular mastery domain(s). In short, feelings of high competency bolster

one's level of self-esteem which leads to positive views about oneself and serves to perpetuate further action within a particular domain(s).

Because most individuals perceive disparate levels of competence in different life domains, Harter (1988) has created domain-specific perceived competence measures, including the domains of cognitive, job, social, physique and athletic competence, among others. Such a multidimensional approach is believed to be far more informative and give a greater understanding of perceived competence than a more traditional approach where a wide variety of self-descriptive items are aggregated into one score (Harter, 1988). Also, while there is a link between multidimensional perceived competence and self-esteem (Harter, 1986), the fact that there are cases where adolescents have acknowledged low multidimensional self-competence while still expressing feelings of positive self-worth has lead Harter (1988) to include a general measure of self-worth along with her perceived competency measures. This global measure of self-worth, which is not supposed to reflect a sense of general competence, focuses on one's general self-esteem level (Harter, 1988). The fact that perceived competence and self-esteem are related, yet distinct concepts is an important point which will be discussed further in this dissertation.

As already explained, most individuals obtain feelings of competence in normative life domains such as work, school, social settings, sports, and physical appearance leading to positive self-views. However, some individuals, feeling a lack of competence in any or all valued normative domains, seek other, nonnormative areas in which to excel in an attempt to either assuage negative feelings associated with past failures in normative domains or to find an untried, potentially rewarding mastery domain altogether. Such perceived

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competence strivings have been linked to illicit activity like drug use (Kaplan, Martin, Johnson, & Robbins, 1986; Kaplan, Martin, & Robbins, 1984; Wills et al., 1992). Nonnormative subcultures (like drug-users), consisting of others who share common perceptions of being unable or unwanting to fit into normative life roles, can become havens for those feeling unwanted, unloved, or unsuccessful (Kandel, Kessler, & Margulies, 1978). It is within these groups that low competence individuals can bond with similar others without the extreme pressures and psychological turmoil associated with mainstream society. Thus, low perceived competence in normative life domain(s) can have a great impact on individuals' decisions to associate with deviant subcultures such as drug-users.

Although no empircists have attempted to apply Harter's (1986) model of perceived competence to drug use, many have alluded to this variable while addressing the effects of self-esteem upon drug initiation (e.g., Kandel et al., 1978; Kaplan et al., 1986; Kaplan et al., 1984). This has lead to some conceptual confusion in attempting to understand the psychosocial mechanisms responsible for drug use. For example, is it low self-esteem or low domain-specific perceived competence or both that serve as impetuses to consume illicit drugs like AAS? As can be seen in the following sections, the answer to this question remains inconclusive as a result of past researchers' differences in operationalizing the construct of self-esteem.

Competency Threads In Drug Use

Researchers on drug-use have found self-esteem problems to be central to drug initiation. For example, Kaplan and colleagues (Kaplan et al., 1986; Kaplan et al., 1984) have found that self-derogating adolescents (defined as those possessing low self-esteem caused by negative experiences associated

with family, school, and peers) are vulnerable to associating with drug subcultures within school in order to assuage feelings of self-rejection and to bolster self-esteem by bonding with similar others. Kaplan and colleagues as well as Kandel et al. (1978) have surmised from their studies that low self-esteem individuals' perceived failure in interpersonal relationships and academics, resulting in feelings of rejection and self-loathing, may serve as impetuses for them to abandon these "failed" groups for untried, nonnormative groups. Using Harter's (1986) model to interpret the aforementioned results, it would seem that perceived incompetence in scholastic and interpersonal domains may play a role in leading individuals to adopt more positive attitudes towards nonnormative peer groups and deviant behavior. However, because the past studies concentrated on the concept of self-esteem, it remains unclear whether low general self-esteem, academic and social incompetence, perceived incompetence in other normative domains, or some combination thereof is responsible for these burgeoning attitudes towards drug-use and drug-users. It is conceivable that both low multidimensional competency and low general self-esteem both play a role in drug use. However, what cannot be inferred from these studies is whether feelings of incompetence in other, unmentioned life domains also play a role in the initiation of drug-use, in general, and AAS-use, in specific. Because AAS-use has some distinct characteristics from that of general drug-use (e.g., attempting to master a socially acceptable domain [albeit with socially unacceptable means]) (Brower, 1992a), one may speculate that feelings of low competence in the physical domain may also play a role in the initiation of AAS.

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Dion, Berscheid, and Walster (1972), in their seminal study on physical appearance, found a dramatic halo effect for physical attractiveness which they summarized with the maxim "what is beautiful is good." This apothegm linking beauty and goodness indicates an implicit personality stereotype (Adams, 1982) whereby physically attractive individuals are believed to possess a wide array of positive characteristics (although more recent research has revealed that individuals who are deemed very physically attractive are also perceived to possess negative characteristics revolving around self-obsession [see Dermer & Thiel, 1975; Eagly, Ashmore, Makhijani, & Longo, 1991; Ryckman, Robbins, Kaczor, & Gold, 1989]). For example, physically attractive individuals are often believed to be socially competent (Eagly et al., 1991), intelligent, well-mannered, kind, and sensitive (Berscheid & Walster, 1972), yet also vain and egotistical (Cash & Janda, 1984).

Because personality traits are implicitly associated with somatotypes (e.g., Ryckman et al., 1989), Westerners base a great deal of their self-esteem and self-worth on their physical appearance. The enmeshment between traits and appearance is so strong that one's own overweight or underweight physique may indicate bad qualities not only to others, but to oneself (e.g., Secord & Jourard, 1953). Females who perceive themselves as too fat and males who perceive themselves as too fat or skinny, often feel a decreased sense of self-worth, not only because they know others feel contempt for their physical appearance, but also because they may feel that they lack the necessary will-power or self-respect demanded by society to maintain a normative appearance. These individuals may feel like outcasts in a society of the thin and fit. For males and females who believe "I am very out-of-shape, therefore I must be weak-willed, lacking of discipline, etc...", psychological disorders can

become a reality (Thompson & Psaltis, 1988). Strong associations between body dissatisfaction and lowered self-esteem and general psychological distress are common (Thompson & Psaltis, 1988).

Because the relationship between body-image dissatisfaction and lowered self-esteem is so strong (Striegel-Moore, Silberstein, & Rodin, 1986; Thompson & Psaltis, 1988), dieting and exercise have become cultural phenomena in the West. Many individuals of this culture watch what they eat and adhere to some sort of exercise regime not only to maintain a healthy lifestyle, but also to earn the privilege of being able to feel good about themselves. By themselves, dieting and exercise can be a healthy means to losing fat and gaining muscle. However, individuals with more severe intrapsychic problems may use these means not just to control their bodies like normal individuals, but to defeat them. Mastery of the physical self can become an outright obsession in those individuals with a fragile sense of self. Low self-esteem individuals have been shown to possess unstable and inconsistent views of themselves (Campbell & Lavallee, 1993) which can lead to deviant behavior. For example, females who are unable to resolve androcentrically defined societal values (Gilligan, 1982), such as the make-up of the socially acceptable female somatotype, and who lack a sense of personal identity and personal competence, may rebel against them via anorexic and bulimic tactics (Gordon, 1990).

Besides possessing low self-esteem, many females, in general, and anorexics, in particular, are unable to correctly estimate their body size. For example, in one survey, Thompson (1986) found that 95% of females overestimated the size of their bodies. Slade and Russell (1973) and Gordon (1990) found similar results in their work with anorexic patients. Such body

image disturbance, now referred to as Body Dysmorphic Disorder (BDD) by the DSM-IV, may be triggered by low self-esteem, and general psychological dysfunction in females (Thompson, 1990).

Most research on body satisfaction and its consequences have been conducted using female participants. As a result, much knowledge has been gained into the "social epidemics" of anorexia nervosa and bulimia nervosa (Gordon, 1990). However, very little attention has been given to males and their battle to conform to the normative standards of physical appearance. Like females, males within Western society are quite aware of societal pressures towards mesomorphy. These pressures begin quite young, in fact. Taylor (1985) made this quite clear after taking an informal poll of children from ages 3 to 5. He found that of these children, 50% considered "He-Man: Master of the Universe" as their favorite television program, citing the central character's enormous muscularity and omnipotence as reasons for their attitudes. The desire for mesomorphy remains strong throughout males' adult lives as demonstrated in the DiBiase and Hjelle (1968) and Ryckman et al.'s (1989) studies, where males associated the most positive qualities towards other males possessing mesomorphic somatotypes and more negative qualities towards males with endomorphic and ectomorphic somatotypes.

Similar to females, many males also experience body dissatisfaction. Cash, Winstead, and Janda (1986), after evaluating a representative sample of 2,000 out of 30,000 adults in a nationwide survey, found high levels of body image dissatisfaction among males. Most males want to gain muscle (e.g., Brodie, Slade, & Riley, 1991; Drewnoski & Yee, 1987) and therefore have shown a tendency to overestimate (albeit slight) their bodyweight (Collins & Plahn, 1988). (It should be noted that most research fails to differentiate

between the desire to lose fat and/or gain muscle. Therefore, some males may overestimate and some may underestimate their body shape. Regardless, whether they feel too fat or too thin, many males still feel a sense of inadequacy for failing to attain the societal ideals of mesomorphy.)

As a consequence of feeling inadequate about their body shape, many males undertake a healthy approach to reach their goal of becoming more mesomorphic. Such tactics include exercise and dieting, which when properly carried out, can dramatically increase individuals' self-worth and physical competence. For example, Melnick and Mookerjee (1991) found increases in self-esteem and body-cathexis scores in males who gained muscle and strength after completing a weightlifting course. Also, past research on weightlifting have shown significant increases in males' mental health variables (e.g., Dishman & Gettman, 1981; Tucker, 1982, 1987). For example, after statistically matching males on a battery of psychological variables, Tucker (1987) found significantly improved self-perceptions in body cathexis in weightlifting males over control group males. Tucker (1987) discussed these results in terms of the following:

> "Perhaps as the male body becomes stronger and more muscular as a result of weight training, the subject perceives his physique as reflecting the more ideal mesomorphic image, which increases body satisfaction and bolsters feelings of personal pride" (p.74).

In sum, weightlifting can be a benefical tool in boosting males' sense of body image, self-esteem, and physical competence by helping them reach the mesomorphic ideals held in contemporary Western society. However, similar to dieting, exercise, while healthy in moderate amounts, can become an abused vehicle through which psychologically unsound individuals attempt to reconcile severe intrapsychic problems. For example, in their 1983 study on running, Yates, Lechey, and Shisslak reported individuals who refused to stop

exercising even when injured. These "obligatory runners" revealed many of the same psychological characteristics possessed by anorexics such as suppressed anger and perfectionism. Driven by the ultimate goal of thinness, ironically, these emaciated individuals sacrificed their physical and mental well-being in order to attain an ideal body image. Thus, males have been shown to possess distorted body perceptions as well as to resort to deviant behavior, just like women, in their attempt to conform to societal somatotypic ideals. However, these psychological disturbances have been shown in a rather exceptional sample of males, those who aspire thinness. One is left to wonder if and how such disturbances affect males striving for mesomorphy and if they are connected to AAS-initiation.

Interim Summary

Low self-esteem and low multidimensional competence (most notably, in academic and social domains) appear to be central to drug abuse vulnerability. Resulting from these feelings of ineptitude, these individuals become more willing to broach new, nonnormative groups such as drug-users and adopt deviant behaviors such as drug use (Kaplan et al., 1984, 1986). Once immersed within a drug subculture, low self-esteem/low multidimensional competent individuals may form strong bonds with drug-users, perhaps for the first time, and come to depend upon them for emotional and psychological support. Thus, with the heavy reliance on drug members, peer pressure to conform to drug behaviors becomes a reality for such individuals (e.g., Kaplan et al., 1984, 1986).

Low self-esteem individuals have also been shown to be more susceptible to bodily illusions. Because Western society places such enormous importance upon physical appearance, individuals with low self-esteem may never see

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themselves as physically worthwhile. In fact, Harter (cited in Baumeister, 1993) points out that physical attractiveness is a strong and stable predictor of self-esteem within Western culture. As a result, eating and exercise disorders have become a reality in the late twentieth century (Thompson, 1990). Thus, individuals possessing low multidimensional competence, low self-esteem, and BDD may adopt favorable attitudes towards illicit substances, like drugs and nonnormative people, like drug users, which may then increase the likelihood of engaging in deviant behavior, like drug-use. This deviant behavior may take the form of AAS-use in those males seeking mesomorphy.

The Relationship Between Psychosocial Variables and AAS-Vulnerability

The aforementioned variables were selected as predictors of AAS vulnerability by using Harter's (1978, 1981) perceived competence model to sort through the AAS-related areas of general drug abuse, eating disorders, and BDD. However, while these variables are interesting in their own right, it is necessary to ascertain whether they have surfaced in past AAS research before including them in a model of AAS-vulnerability. Therefore, the following section will address the relationship between AAS-use and perceived competence, self-esteem, BDD, peer pressure, and attitude towards AAS. Also, although AAS-use is related to the aforementioned areas, it is also quite distinct from them. For instance, Brower (1992a) has mentioned that AAS-users probably have some motivational differences for their drug use than general drug users. Because the consumption of AAS has not been adequately proven to cause euphorigenic or immediate effects unlike many general drugs such as cocaine or amphetamines, AAS-users probably have some different reasons for taking their drug of choice than general drug users. Therefore, other psychosocial variables which have surfaced in AAS-research such as weight training

dissatisfaction and locus of control will also be discussed in terms of their potential for influencing AAS-initiation.

It should be noted that, just as in the general drug abuse literature, no empiricial attempts have been made to clarify the self-esteem/perceived competence relationship in the AAS-literature. Although many contemporary researchers have discussed AAS-use in terms of self-esteem (e.g., Blouin & Goldfield, 1995; Klein, 1986, 1989; Olrich, 1990), perceived competence issues have been alluded to in these studies. Therefore, the relationship between perceived competence and AAS-initiation will be highlighted in this section.

Perceived competence appears to play a vital role in the initiation of bodybuilding and AAS. Klein (1986, 1989), who lived in the mecca of bodybuilding, Venice, California, for a lengthy duration while gathering qualitative data on the bodybuilding subculture, found that many adolescents engaged in bodybuilding to combat poor self-images, unmet interpersonal needs, and personality deficiencies often revolving around physical competency concerns. In addition, Olrich's (1990) qualitative study on 10 AAS-users found perceived competence to be central to participants' decisions to use steroids. Olrich (1990), while not specifically addressing competence domains, found that many AAS-users described unsatisfying athletic experiences, physique perceptions, academic achievements as well as the social benefits of getting big as reasons for engaging in bodybuilding and eventually AAS-use.

From these studies, it would seem logical to surmise that AAS-users may feel not only a sense of low self-esteem, but also low competence in academic, physical, athletic, and possibly social domains which may then serve as impetuses to engage in bodybuilding and AAS-use. Perhaps, then, one

differentiating characteristic between AAS-users and nonusers is that AAS-users may feel incompetent in many normative domains (multidimensional incompetence) whereas AAS-nonusing weightlifters feel relatively incompetent only in the physical domain. AAS-users may see their bodies as the last bastion of control and mastery in a world comprised of unsuccessful or unsatisfying attempts at integration and normalcy. Therefore, because the physique becomes central to one's self-concept, any perceived threats to it, such as a lack of training progress, can result in extraordinary consequences (such as drug use).

Interesting parallels have been drawn between AAS-users and anorexics. Brower (1989) has noticed that both of these groups possess a type of BDD. Just as anorexics never see themselves as small enough, AAS-users may never see themselves as big enough (e.g., Brower, Blow, Young, & Hill, 1991; Pope, Katz & Hudson, 1993). In fact, AAS-users have reported body size dissatisfaction despite getting physically bigger (Brower et al., 1991a). These feelings of physique dissatisfaction, resulting from low self-esteem and possibly low multidimensional competence, appear to be central to AAS-initiation (e.g., Brower, 1992a; Olrich, 1990) and thus may have strong predictive power of AAS-use.

Peer pressure has been found repeatedly to be an important mediator of AAS-consumption (Goldman & Klatz, 1992; NIDA, 1991; Taylor, 1985). For example, in Yonker et al.'s (1990) study, 53 out of the 1057 who admitted using AAS listed peer pressure as the third most important factor why they consumed these drugs. Perceived increases in peer strength and size, due to AAS, relative to one's self, peer attitudes towards AAS, and peer distribution of AAS (Chng & Moore, 1990) have all been shown to be key elements in AAS-

initiation (Goldman & Klatz, 1992). Thus, peer pressure can have a dramatic effect via direct channels (e.g., making drugs more available to peers, making jokes about a peer's small size) and indirect channels (e.g., social comparison).

Attitudes about AAS-use distinguished AAS-users from nonusers in Chng and Moore's (1990) study where AAS-users tended to have very favorable attitudes and nonusers unfavorable attitudes towards these drugs. Thus, similar to other illicit drugs (e.g., Kandel et al., 1978), there appears to be an attitude-behavior link concerning the initiation of AAS. However, no AAS research to-date has attempted to target this complex relationship. After all, one cannot ascertain from Chng and Moore's (1990) findings whether AAS-users developed favorable attitudes before or after taking these drugs. In addition, social psychologists are clear in pointing out that the possession of favorable attitudes towards any attitude-object only occasionally, by itself, translates into attitude-consistent behavior (e.g., Fishbein & Ajzen, 1975). However, in conjunction with high BDD, peer pressure, multidimensional perceived incompetence, and low general self-worth, individuals possessing favorable attitudes towards AAS may be highly vulnerable to initiating their use.

AAS-Specific Psychosocial Variables

While not specifically investigated in past AAS-research, locus of control may constitute another link in the concatenation leading to AAS-use. Central to Harter's (1978, 1981) conception of competence is control. Individuals who perceive themselves to have the ability to control a particular domain are likely to reap the psychological and emotional benefits associated with task mastery. However, individuals who feel a lack of control in a meaningful environment are likely to face the intrapsychic problems associated with perceived incompetence. Such beliefs of control or lack thereof have been shown to be

central to individuals' desire to initiate weight training and AAS consumption (Olrich, 1990).

For many, the motivation to weight train is highly dependent upon perceived improvement or potential improvement in somatotype and strength. That is, individuals who engage in weightlifting to change their physical appearance and/or strength will not be satisified unless they eventually see these changes. The adoption of an internal locus of control to initiate weightlifting often remains fairly strong over the first three to six months of training because moderate strength and muscular improvements occur as the body struggles to adapt to the new physical stressors unloaded upon it (Wilmore & Costill, 1988). However, after this moderate time period, these neuromuscular changes ineluctably decline and physiological plateaus often set in. These training plateaus are often a result of inadequate diet (resulting in a negative nitrogen balance), unsystematic training, or improper recuperation which can lead to an overtrained state (Costill, Flynn, Kirwan, Houmard, Mitchell, Thomas, & Park, 1988).

During training plateaus, which can last for years without proper knowledge of training, diet, or recuperation principles, weightlifters can become discouraged because their psychological needs fail to be met as soon as their somatotype/strength fail(s) to improve. Such perceived weight training dissatisfaction can also result via social comparison processes. Low self-esteem and competent individuals who perceive other (potentially AAS-using) gym members to be by-passing them in terms of gaining muscle and strength can become dissatisfied with their weight training. As a result, cessation (quitting, burn-out, or injury) of weightlifting often results. However, those with strong psychological needs may keep training except with a different mindset.

While once believing that through strong effort and favorable genetics they could build a mesomorphic body, after meeting with perceived slowed or plateaued training effects, some individuals adopt the belief that they are genetically limited to their particular body proportions. A "slow" or "hard gainer" philosophy can cause individuals to adopt dramatic behavioral tactics, such as consuming massive amounts of protein, buying esoteric and often worthless vitamin and mineral supplements, initiating systematically senseless training practices, and initiating AAS use.

In sum, the psychosocial variables of multidimensional competence, self-esteem, BDD, attitude towards AAS, peer pressure, and dissatisfaction with weight training all appear to play a role in AAS-initiation. However, as already mentioned, in order to get an accurate picture of human behavior such as AAS-use, the power of situational variables also have to be taken into account.

AAS-Use and Situational Factors

Psychosocial factors, when taken alone, rarely account for more than 30% of the variance associated with human behavior (cited in Ross & Nisbett, 1991). However, when psychosocial and situational factors are taken together, human behavior becomes much more predictable. Concerning situationalism, Lewin (1952) describes the social context as a potent force which can produce or constrain behaviors. For example, individuals in new cultural settings or amid evaluative groups tend to behave differently than when in familiar or relaxed environmental climates. Thus, surrounding others can have a drastic impact upon individuals' behaviors. In addition to the social context, Lewin (1952) maintains that apparently minor, yet important details (termed "channel factors") of the situation are also critical facilitators or barriers of behavior (cited in Ross & Nisbett, 1991). For example, engaging in a weightlifting class may be very

dependent upon such channel factors as finding adequate child care, viable transportation, extra money, free time, and an appropriate health club. Exactly how much impact these and other situational features actually have depends upon their interaction with individuals' personality characteristics. In the weightlifting class example, enrollees with low self-esteem and BDD may feel very motivated to circumvent any situational barriers which may prevent entry into the class. Furthermore, these enrollees may become even more adamant in their desire to become fit if surrounded by fit role models rather than unfit club members. Also, besides providing a physique in which to aspire, fit gym members may also provide aspiring others with particular behaviors in which to emulate. For instance, enrollees may connect fitness with particular exercise use and vitamin ingestion by watching fit gym members' behaviors. Such observational learning may take place in low self-esteem/competent, mesomorphy-aspiring males by watching bigger bodybuilders work out. However, instead of mimicking vitamin use, AAS-use may be the desired modus operandi.

Situational factors appear to play a large role in AAS-initiation. The social context of the gym may be one such influential component. For example, in Olrich's (1990) study, AAS-users admitted that bigger and stronger gym members served as motivators to become huge. While peer pressure appears to account for AAS-initiation to some extent (Chng & Moore, 1990), the question remains whether the mere presence of bigger bodybuilders can impact individuals' desire to use AAS. Perhaps those mesomorphy-aspiring males possessing low multidimensional competence, low self-esteem, and BDD are more likely to consider AAS if they constantly work out in gyms filled with bigger, stronger, and perhaps AAS-using weightlifters. Anecdotally, the author has

observed that big and aspiring bodybuilders tend to seek out gyms where there are other intense-training bodybuilders while individuals who aspire to simply tone their muscles tend to train at less-intense health spas. Therefore, the social context of the gym may have an impact on individuals' decisions to consider using AAS. It should be noted that peer pressure and social context of the gym should be considered separately because while AAS-using peers can serve as facilitators of AAS-use for some, the simple process of comparing oneself to a gym full of unknown, huge bodybuilders may be all that is needed to consider AAS-use for others. In sum, both pressure from peers and the social context of the gym where larger, stronger, and perhaps AAS-using bodybuilders work-out may contribute to AAS-initiation in males with self-esteem and competence problems.

Another situational factor which has been shown to be key to drug vulnerability (Kandel, 1978) and AAS-use (Buckley et al., 1988; Chng & Moore, 1990) is drug availability. Individuals who are surrounded by drug-using others have these drugs more available to them. This is especially important to AAS-users, given the recent classification of steroids as Schedule III drugs (Sherman, 1992) and their resulting diminished availability. Thus, surrounding oneself with deviant peers has many disadvantages. Not only can they facilitate nonnormative behaviors in individuals with low self-esteem and low multidimensional competence, but they may also serve as providers of illicit substances.

Summary

It is imperative for all clinicians, educators, and parents to understand the causal antecedents of AAS-use in order to identify individuals' potentially vulnerable to AAS and to be able to prevent or intervene with their use. The

delinquency of past empiricists to ascertain these psychosocial and situational antecedents resulted in the genesis of this dissertation. In order to fully understand individuals' vulnerability towards using AAS, it is necessary to compare the attitudes and behaviors of individuals who are in varying phases of AAS-use as well as those individuals removed from AAS, altogether. Therefore, this study will juxtapose AAS-using weightlifters, weightlifters who are staunchly opposed to using AAS, AAS-nonusing weightlifters who are contemplating use, and individuals who do not or infrequently exercise (individuals who regularly exercise may exhibit similar psychosocial problems associated with their somatotype like "obligatory runners") on the psychosocial and situational variables which have been presented in this review.

While there are many variables which have surfaced as potential predictors of AAS-use, perceived competence and self-esteem appear to be most central to this phenomenon (Olrich, 1990). Using Harter's (1978, 1981) perceived competence model as the basis for understanding AAS-use, the psychosocial variables of perceived competence, self-esteem (defined by Harter as general self-worth), body image disturbance, peer pressure, weight-training motivation, weight training dissatisfaction, locus of control, and attitude towards AAS were selected as predictors of AAS vulnerability. In addition, the situational variables of social context of the gym and availability of AAS were also selected as predictors of AAS vulnerability.

Besides comparing AAS-using and nonusing groups on these variables, a path analysis performed on the AAS-nonusing weighlifters would help to determine the strongest causal link(s) potentially leading to AAS-use. Using Ajzen's (1991) Theory of Planned Behavior (see Figure 1) as a guide, this study's model of AAS-Intention was formulated.

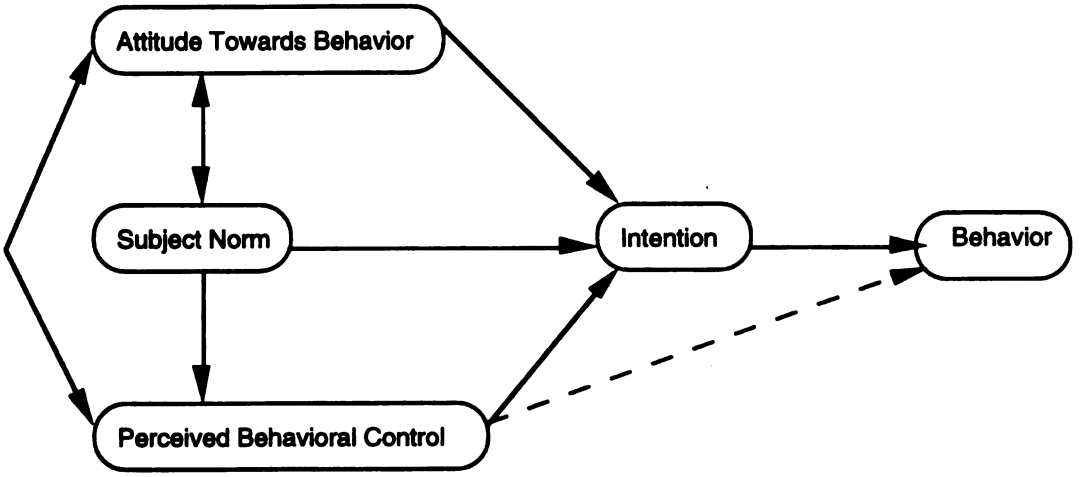

Figure 1. Ajzen's (1991) Theory of Planned Behavior

As seen from this model of volitional behavior, attitudes towards behavior possess a direct relationship with intention, as do beliefs about significant others' approval of the target activity (aka subject norm), and participants' perceived behavioral control of the target activity. Based on these theorized relationships, the hypothesized path model which will be tested in this study is presented in Figure 2. Following Ajzen's (1991) theorized path relationships, this study's path model will predict that participants' attitude towards AAS, peer and contextual pressure to gain muscle mass and perceived approval to use AAS (these variables loosely correlates with Ajzen's "Subject Norm"), and AAS-Find (this variable is an important situational component of Ajzen's "Perceived Behavioral Control") all impact participants' intention to use AAS.

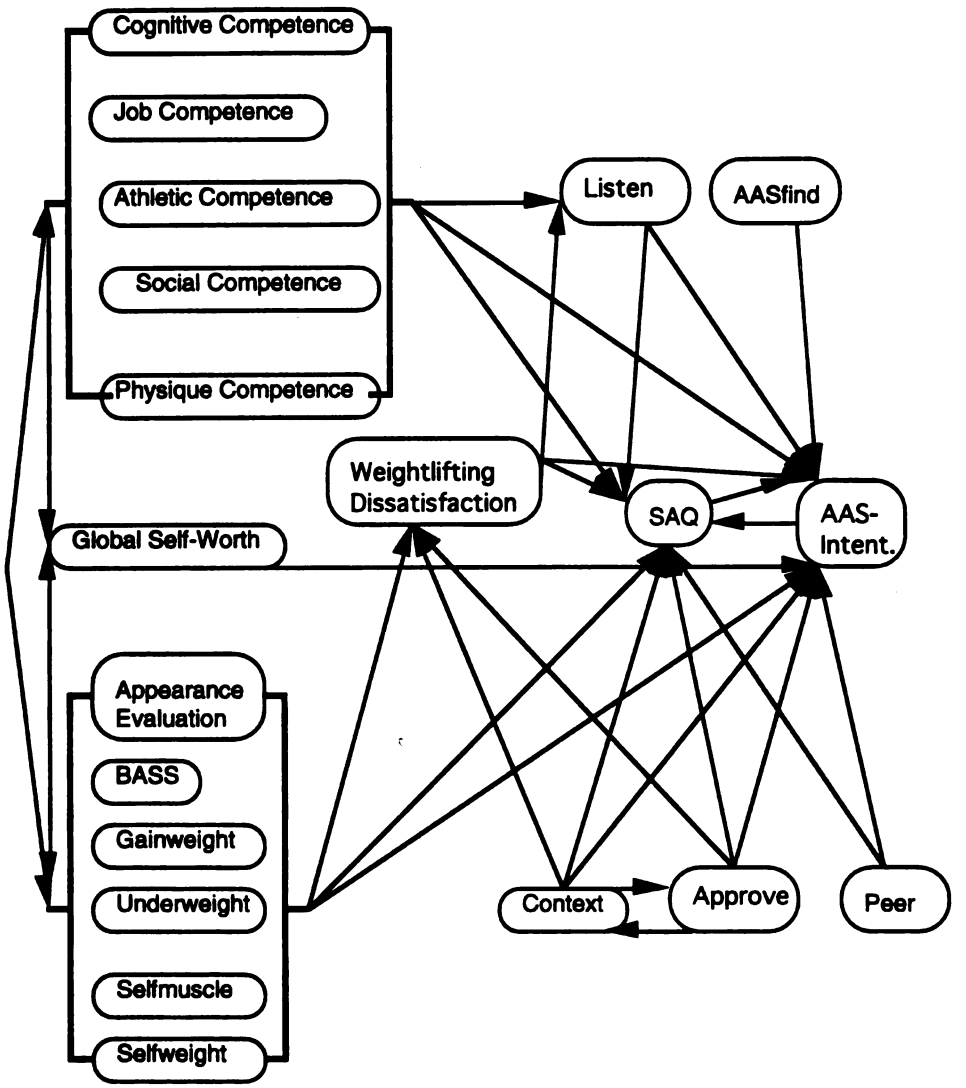

Figure 2. Proposed path analytical model for the intention to use Anabolic-Androgenic Steroids.

The other psychosocial variables contained in this model are referred to as external demographic variables by Fishbein and Ajzen's (1975) Theory of Reasoned Action and are believed to impact both attitude (SAQ) and intention

to use AAS (AAS-Intent.) based on past AAS, drug abuse, and body image literature.

Hypotheses

The following groups will be used in this study: AAS-using weightlifters (AAS-Users), weightlifters who are staunchly opposed to AAS (AAS-Noncontemplators), AAS-nonusing weighlifters who are contemplating AAS-use (AAS-Contemplators), and non or infrequent exercisers (controls). The hypotheses guiding this research are grouped by the psychosocial and situational variables which are being tested in this study and presented below.

Perceived Competence/Global Self-Worth

Hypothesis 1: AAS-Contemplators will have lower perceived competence in the normative life domains of cognitive, athletic, job, physique, and social competence than any of the other groups.

Hypothesis 2: AAS-Contemplators will have lower global self-worth than any of the other groups.

Descriptive Variables

Hypothesis 3: The AAS-User group will be significantly heavier than the other groups.

Physique Variables

Hypothesis 4: The AAS-User group will possess a significantly larger body size than the other groups.

Hypothesis 5: The AAS-Contemplator group will desire a greater body size differential (goal body size - actual body size) than any of the other groups.

Multidimensional Body-Self Relations Questionnaire (MBRSQ)

Hypothesis 6: AAS-Contemplators will have the greatest body image disturbances of any of the other groups.

Weightlifting Questionnaire

Hypothesis 7: AAS-Users will be stronger than the other weightlifting groups.

Hypothesis 8: AAS-Contemplators will train more hours per week than the other weightlifting groups.

Hypothesis 9: There will be no differences among the groups in terms of how many years they have been weightlifting.

Hypothesis 10: The AAS-Noncontemplators will have been heavier than the other weighlifting groups before they started weightlifting.

Steroid Variable Questionnaire (SVQ)

Hypothesis 12: AAS-Users will possess the most positive attitudes towards AAS.

Hypothesis 13: AAS-Contemplators will express the most pressure to put on muscle mass and possess the greatest belief that the context of the gym in which they train pushes them to put on muscle mass.

Hypothesis 14: AAS-Contemplators will be less likely to listen to others' opinions concerning whether they should use AAS.

Hypothesis 15: AAS-Users will express the greatest amount of support from others concerning AAS-use.

Hypothesis 16: AAS-Users will be able to find AAS easier than any of the other weightlifting groups.

Hypothesis 17: AAS-Contemplators will express the greatest dissatisfaction with their weightlifting than any of the other groups.

Delimitations

This study was conducted with the use of individuals from various private and public gymnasiums containing free weight training equipment in 15 states

and 1 Canadian province. All of the weight training participants were male volunteers who were at least 18 years of age. All control group participants were male volunteers from various university classes who admitted that they either did not or rarely exercised.

Limitations

Because such a small number of AAS-users were used in this study, the generalizability of the results are very limited. Also, this study is limited by the completeness of responses of the participants. This study is also limited by its methodology. Being a straight survey study, groups were not matched in terms of age or educational background or other potentially differentiating variables. In addition, because many of the scales used in this study were constructed by the author and were only tested for internal consistency (Cronbach's alpha), it is uncertain as to whether they possess validity beyond mere face validity as well as other forms of reliability.

Definitions

1. Anabolic-Androgenic Steroids (AAS): The synthetic derivatives of the male sex hormone testosterone. Although modified to enhance its anabolic (growth-producing) capabilities, AAS still possess androgenic (masculinizing) characteristics which are usually associated its toxicity. In this study, AAS will be used synonymously with other illicit, performance enhancement drugs such as clenbuterol, human growth hormone (HGH), and "cow pellets".
2. Weightlifter: A male who currently engages in weight training at least twice a week in a public or private weight training facility.
3. AAS-Contemplator: An AAS-nonusing weightlifter is considered to be cognitively preoccupied with AAS-use if he achieves a mean score of 3 or greater (out of 5) on the AAS-intention variable subscale. This variable

includes items such as, "I am currently thinking about using steroids" and "I have thought about using steroids before".

4. AAS-Noncontemplator: An AAS-nonusing weightlifter is thought to possess low cognitive preoccupation with AAS-use if he achieves a mean score of less than 3 on the AAS-intention variable subscale.

5. AAS-User: A weightlifter who admits to currently using or having used AAS on the Steroid Variable Questionnaire.

6. Control group subject: A college male, selected from university level classes, who does not or infrequently (less than twice per week) exercises.

Acronyms

1. AAS = Anabolic-Androgenic Steroids.
2. AAS-Find = Perceived ability to find AAS.
3. AAS-Intention = Intention to use AAS.
4. Appearance = Perceived appearance evaluation.
5. Approve = Perceived approval from significant others to use AAS.
6. BASS = Body Areas Satisfaction Scale.
7. BIC = Body Image Concerns.
8. BDD = Body Dysmorphic Disorder.
9. Compbef = Past bodybuilding, powerlifting, or Olympic Weightlifting history.
10. Compfuture = The desire to compete in a future bodybuilding, powerlifting, or Olympic Weightlifting competition.
11. Context = Perceived social context of the gym.
12. Hourlift = Number of hours spent weightlifting per week.
13. Liftdiss = Weightlifting Dissatisfaction.
14. Listen = Desire to listen to significant others' opinions of AAS-use.
15. Locus = Weightlifting Locus of Control.

16. MBSRQ = Multidimensional Body-Self Relations Questionnaire.
17. Overweight = Overweight Preoccupation.
18. Peer = Peer pressure to gain muscle mass.
19. Pre-weigh = Weight prior to initiating weightlifting for the very first time.
20. Self-Muscle = Self Classified Muscular Status.
21. Self-Weight = Self Classified Body Weight.
22. SEM = Structural Equation Modeling.
23. SAQ = AAS-attitude.
24. Size Difference = Goal for one's arm, leg, and chest sizes - one's actual arm, leg, and chest sizes.
25. SVQ = Steroid Variables Questionnaire.
26. Underweight = Underweight Preoccupation.
27. Usebef = AAS-use history.
28. Vratio = Chest to waist ratio.
29. Vratio Difference = Goal for one's chest/waist ratio - one's actual chest/waist ratio.
30. Yearlift = Number of years spent weightlifting.

Assumptions

All participants answered all questions truthfully and to the best of their abilities.

Chapter 2

METHOD

Participants

One hundred and sixty-seven male weightlifters and 31 male, collegiate non-exercisers volunteered for this study (which was approved by the Michigan State University Committee on Human Subjects - see Appendix A). Weightlifters were recruited in owner-approved private and public weightlifting facilities located in 15 States and 1 Canadian Province while non-exercisers were recruited from university classes in these same geographical regions. Only males were surveyed because past research has shown AAS-use to be dominated by males (Buckley et al., 1988). While no particular age group was targeted, most of the participants were of college age (and Caucasian), reflecting the average age of gym members in college towns. Participants' mean age was 26.71 years (SD = .63) and mean height was approximately 71 inches (SD = 2.86). Although participants were pooled from many different areas, approximately 61% of the responses came from those who lived in midwestern states.

In this study, 198 out of 281 participants (70%) returned the questionnaires. Participants were divided into 4 groups: Nonexerciser control group (31 members), AAS-Contemplators (15 members), AAS-Noncontemplators (120 members), and AAS-Users (31 members). Individuals were placed into the AAS-User group if they indicated that they had used AAS before or into the control group if they had indicated that they never or rarely exercised. AAS-Contemplators were differentiated from AAS-Noncontemplators based on their score on the 4-item, AAS-Intention Subscale found on the Steroid Variable Questionnaire (see Appendix B). Participants

who scored below a 3.0 on this five-point Likert Scale were placed in the AAS-Noncontemplator group while those who scored a 3.0 or better on this scale were placed in the AAS-Contemplator group. While it would have been beneficial to have had more AAS-Users, AAS-Contemplators, and (nonexercising) control group members, it was very difficult to find individuals who would admit that they either used or were thinking about using AAS or that they did not exercise at all - especially among this age group.

Data Collectors and Self-Report Measures

Data collection was conducted by the principal investigator in addition to several graduate students and professors from other states. While past research on illicit drug use has shown drug users' self-reports on their drug habits to be sufficiently valid (Maistro, Sabell, & Sobell, 1982-83; Needle, McCubbin, Lorence, & Hochhauser, 1983) and reliable (Barnea, Rahav, & Teichman, 1987; Needle, Jou, & Su, 1989) regardless of the setting in which they were administered, special care was taken to obtain veridical results by employing individuals who are knowledgeable of scientific processes (e.g., graduate students, faculty members). After the self-report measures were distributed by these assistants and the principal investigator, the participants mailed them directly back to the principal investigator. So that all participants were similarly recruited, the author provided all assistants with information sheets on this study's anonymity and confidentiality policies. The self-report measures and consent protocol administration instructions are presented in the next section.

Participants were administered a modified version of Harter's (1988) Perceived Competence Questionnaire For Adolescents and Cash's (1984) Multidimensional Body-Self Relations Questionnaire plus several other factor

analytically reliable and valid questionnaires, devised by the author, which measured participants' perceived peer and gym contextual pressure to gain muscle mass, weightlifting dissatisfaction, locus of control, attitudes about AAS, AAS-intention, and AAS availability. In addition, the author also designed two other questionnaires to measure variables associated with weightlifting (e.g., strength levels, years of weightlifting experience), as well as perception of one's physique (e.g., arm size, bodyfat percentage). See Appendix C for the results of the pilot testing and factor analyses of the finalized questionnaires as well as the psychometric properties and norms of all the subscales used in this study.

Once the questionnaire items were finalized, items from the author-devised scales were intermixed and reverse scored and items from already existing scales were intramixed in order to minimize any demand characteristics. Also, because demand characteristics could have become an issue when dealing with illicit substances and psychosocial variables, all scale items which had nothing to do with AAS were presented in the self-report booklet before any scale items which assessed AAS-related attitudes or behaviors.

Procedure

Participants were recruited and administered the self-report booklets at the entrances/exits of owner-approved weightlifting centers or from collegiate classes only if they agreed to participate in this study. Upon receipt of the questionnaire, participants were directed to complete the booklet at home, by themselves, and mail it directly back to the principal investigator, using the enclosed envelope, in order to ensure confidentiality.

Participants' and the gyms' anonymity were protected as follows:

1. Participants were told NOT to place their names, addresses, or any other identifying marks on the self-report booklet or envelope.

2. Participants were told NOT to identify the gym in which they train.

Also, participants and gym owners were assured of their confidentiality as follows:

1. Although all participants received the self-report booklet in the gym, they were directed to complete it at home, conferring with no one.
2. Once the booklet was completed, participants were told to mail it directly to the principal investigator, using the enclosed author-addressed, stamped envelope.
3. The principal investigator was the only person to view the raw data.
4. Upon receipt of the completed questionnaires, all booklets were given a generic identification number which did not identify individual participants or gyms.
5. All results were documented in group terms.

Besides the confidentiality and anonymity procedures, the data collectors explained to participants that their participation in this study is totally voluntary, they could discontinue this study at any time without penalty, they could choose to skip any questions without penalty, and that there were no right or wrong answers to any of the self-report items. The gym owners were told that their participation in this study was totally voluntary and they could refuse to participate or cease the distribution of the questionnaires at any time. All participants and gym owners were directed to read the consent form (see Appendix D), which stated all of these aforementioned policies. All of the research assistants were given a 1-2 page memo highlighting all of these procedural policies in order to ensure the ethical and consistent recruitment of participants and gyms.

Self-Report Measures

General Questionnaire. Designed by the author, this 4-item questionnaire assessed participants' age, weight, height, and state of residence. Each item

was open-ended, allowing participants to write in their answer (see Appendix E).

Physique Scale. Designed by the author, this 3-item scale assessed the size of participants' upper, middle, and lower bodies as well as their bodyfat percentage (see Appendix E).

Weightlifting Scale. Designed by the author, this 7-item scale assessed weightlifters' bodyweight prior to their first weightlifting experience, length of weightlifting career, number of hours spent weightlifting weekly, and current and best strength levels on the bench press, leg press, and squat. Most questions was open-ended, allowing participants to write in their answer. Also included on this scale were questions assessing whether weightlifters had ever competed or planned to compete in a bodybuilding, powerlifting, or Olympic Weightlifting contest (see Appendix E).

Harter's Perceived Competence Questionnaire. Based on Harter's (1986, 1988) model of perceived competence, 5 domain-specific subscales were selected to measure participants' cognitive, athletic, social, physique and job competence. In addition, in order to measure self-esteem, the global self-worth subscale was used in this study. Each subscale has been shown to possess sufficient internal consistency, with Cronbach Alphas' ranging from .77 to .93. [The reliability given for job competence was .55. However, after finding such a low reliability, Harter (1988) stated that she had revised this subscale, making it more reliable. However, she did not update the reliability figure].

These subscales were selected for use in this study over Harter's other subscales based on the domain-specific competencies found or alluded to in past research on drug use (e.g., Kandel et al., 1978) and AAS-use (e.g., Klein, 1986, 1988; Olrich, 1990). Each subscale is based on a "structured alternative

format" (Harter, 1988) whereby all statements are answered on 4-point scales designed to pull participants away from socially desirable answers. Participants are asked to read two statements and decide which of the two statements is "Really True for Me" or "Sort of True for Me" (see Appendix F).

In using Harter's (1986) self-competence scales, adaptations had to be made to the scales that were originally constructed for adolescents in order to reflect this study's older male population. Such adaptations included changing nouns used to describe the subject population from "kids" to "guys" so that the original statement of "some kids feel that being good looking is important" was changed to "some guys feel that being good looking is important." Another change made to this scale included using past tense verbs in some statements in order to better reflect an older sample of participants. For example, the original statement of "some kids do well at their classwork" was changed to "some guys do/did well at their classwork."

Multidimensional Body-Self Relations Questionnaire (MBSRQ). The subscales of Appearance Evaluation, Body-Areas Satsifaction, Self-Classified Weight, and Overweight Preoccupation were selected from Cash's (1984) 69-item self-report inventory. Assessing the self-attitudinal aspects of body image, these subscales of the MBSRQ appeared to possess the greatest face validity in measuring body image disturbance relative to the unique population of weightlifters (since there are no scales to-date which can assess BDD). Also, because most weightlifters are preoccupied primarily with gaining size and strength and only secondarily concerned with losing fat, the Overweight Preoccupation subscale was modified to reflect participants' fear of losing muscle mass (Underweight) and desire to gain muscle mass (Gainweight). Also, because the Self-Classified Weight Subscale only focused on whether

participants' perceived themselves to be underweight, average weight, or overweight, the principal investigator felt that such a scale would not adequately identify the feelings that weightlifters had of their muscles. Therefore, using the same format as the Self-Classified Weight Subscale, the author created a Self-Classified Muscle Subscale, which assessed participants' self-perceptions of their musculature.

The Appearance Evaluation Subscale contained 14 items, measured individuals' physique evaluation, and was based on a 5-point Likert Scale ranging from 1, "Definitely Disagree" to 5, "Definitely Agree". The Body-Areas Satisfaction Subscale contained 9 items, measured individuals' body satisfaction, and was based on a 5-point Likert Scale ranging from 1, "Very Dissatisfied" to 5, "Very Satisfied". The Underweight and Gainweight Preoccupation Subscales each contained 2-3 items, measured individuals' fear of losing muscle mass and desire to gain muscle mass, respectively, and were based on 5-point Likert Scales ranging from 1, "Never" to 5, "Very Often". The Self-Classified Weight Subscale was based on a 5-point Likert Scale ranging from 1, "Very Underweight" to 5, "Very Overweight" and the Self-Classified Muscle Subscale was based on a 5-point Likert Scales ranging from 1, "Very Small Muscles" to 5, "Very Big Muscles" (see Appendix G).

Steroid Variables Questionnaire (see Appendix B)

AAS-Attitude Scale. This 8-item scale assessed individuals' attitudes towards AAS. Based on 5-point Likert Scales ranging from 1, "Strongly Disagree", to 5, "Strongly Agree", items measured participants' beliefs concerning the legality, benefits, toxicity, and morality of AAS-use.

AAS-Availability Scale. This 3-item question measured participants' perceived accessibility to AAS. Based on 5-point Likert Scales ranging from 1,

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"Strongly Disagree", to 5, "Strongly Agree", items measured participants' perceived connections with gym members, doctors, and others who could supply them with AAS.

Weightlifting Dissatisfaction Scale. This 3-item questionnaire measured participants' evaluation of their weight training. Based on 5-point Likert Scales ranging from 1, "Strongly Disagree", to 5, "Strongly Agree", items tapped participants' satisfaction with their physique and strength levels in relation to weight training.

Weightlifting Locus of Control Scale. This 1-item question measured participants' beliefs concerning their ability to change their physique. Based on a 5-point Likert Scale ranging from 1, "Strongly Disagree", to 5, "Strongly Agree", this item measured participants' beliefs about their genetic limitations in relation to their physique and strength goals.

Social Context of the Gym Scale. This 4-item questionnaire measured participants' perception of fellow gym members in terms of size, strength, and AAS-use. Based on 5-point Likert Scales ranging from 1, "Strongly Disagree", to 5, "Strongly Agree", items addressed the types of gyms at which participants trained and the somatotype, intensity, and perceived attitude of the clientele who weight trained in the same gym.

Peer Pressure Scale. This 2-item scale assessed participants' perceived peer pressure to gain muscle mass. Based on 5-point Likert Scales ranging from 1, "Strongly Disagree", to 5, "Strongly Agree", items tapped participants' belief that their peers joked of their small size and participants' desire to become as strong as their peers.

AAS-Intention Scale. This 4-item scale measured weightlifters' intention to consume AAS in the future. Based on 5-point Likert Scales ranging from 1,

"Strongly Disagree", to 5, "Strongly Agree", items focused on participants' cognitive preoccupation with AAS.

Approval Scale. This 4-item scale measured weightlifters' perceptions of how their significant others would evaluate their AAS-use. Based on 5-point Likert Scales ranging from 1, "Strongly Disagree", to 5, "Strongly Agree", items focused on weightlifters' perceptions of how their friends, parents, and relationship partner would react to their AAS-use.

Treatment of the Data

The statistical protocol typically used in psychosocial research to test for group differences on multiple dependent measures has involved multivariate tests followed by post hoc analyses. Such protocol allows for the testing of the variance shared by dependent measures until post hoc analyses are performed. It is at this point where the dependent measures' shared variance is no longer tested, as each measure's unique variance is examined individually. Because the testing of unique variance in post hoc analyses contradicts the statistical assumptions associated with multivariate tests, the results obtained under such circumstances may be replete with Type I errors.

Because of this, discriminant analyses were utilized in this study where multiple dependent measures could be tested together. Such statistical tests allow for the differentiation of group membership based on the thorough examination of the dependent variables' shared variance. In cases where groups were analyzed on only one dependent measure, Oneway ANOVAs were conducted followed by Scheffé post hoc analyses. Also, stepwise multiple regressions were conducted in order to ascertain the strongest predictors of participants' attitude towards AAS and intentions to consume AAS. Lastly, path analyses were tested against Ajzen's (1991) Theory of Planned Behavior in order to

understand the best causal paths associated with participants' intention to use AAS.

When conducting path analyses, structural equation modeling (SEM) is used to determine the best fit of the predicted path model to the actual mathematical path model. When a hypothetical path model's predictive power is tested, almost certainly, some predicted paths are shown to be nonsignificant. Because these paths represent additional parameters and use up degrees of freedom resulting in a weaker model, they are normally thrown out of the model (trimmed) and the model retested. As a result of trimming these nonsignificant paths, path coefficients for the significant paths may change when the model is retested; sometimes becoming stronger and sometimes weaker. Once again, nonsignificant paths are trimmed and the model retested until no nonsigificant paths remain and the modification indicies indicate that no new significant paths have emerged in the trimming process. When the final trimmed model is determined, its root mean square error of approximation (RMSEA) is analyzed to ascertain whether it now differs significantly from the original, untrimmed predicted path model. If this model does differ significantly from the original model, it can be determined that the data does not accurately fit the predicted path model. Conversely, if this model does not differ significantly from the original path model, it can be determined that the data does accurately fit the predicted path model.

Chapter 3

RESULTS

The purpose of this study was to examine potential psychosocial and situational variables which may predispose male weightlifters to initiate AAS consumption. As such, a control group of nonexercisers was compared to 3 weightlifting groups (AAS-Contemplators, AAS-Noncontemplators, and AAS-Users) on several groups of dependent variables: Descriptive variables (e.g., age, weight), Harter's Perceived Competence measures (e.g., cognitive and athletic competence), physique variables (e.g., arm size, percent body fat), variables associated with the Multidimensional Body-Self Relations Questionnaire (e.g., appearance evaluation, body-areas satisfaction), and several variables associated with the Steroid Variables Questionnaire (e.g., ability to find AAS, attitude towards AAS). In addition, the weightlifting groups were also compared on a host of weightlifting-related variables (e.g., hours spent weightlifting per week, most weight ever bench pressed for 1 repetition) as well as on several distinct variables associated with the Steroid Attitude Questionnaire (e.g., social context of the gym, peer pressure to use AAS). Predictors of the intention to use AAS as well as attitudes toward AAS were also determined. Lastly, path analyses were performed in order to test this study's model against Ajzen's (1991) Theory of Planned Behavior and to ascertain the most significant causal paths leading to one's intention to use AAS.

Harter's Perceived Competence Measures

Since past AAS-research has shown AAS-users to possess low self-esteem and possibly low multidimensional competence (e.g., Klein, 1986; Olrich, 1990), it was hypothesized that AAS-Contemplators would possess lower perceived competence in the normative life domains of cognitive, athletic,

job, and social competence as well as in physical appearance than any of the other groups. While the best way in which to test this hypothesis would be to include all of these self-competence measures into one multivariate analysis, statistical power issues prevented this. In fact, the issue of statistical power influenced all of the discriminant analyses used in this study. Because the smallest group in this study contained 15 participants (AAS-Contemplators), a maximum of 3 dependent variables could be tested per discriminant analysis in order to maintain fair statistical power. In situations where incomplete data existed for participants in this group, several factors were weighed when determining the number of variables to include in each analysis: the number of participants in a group, the variables mentioned in a particular hypothesis, and the variables' intercorrelation matrix. Throughout this study, a rationale will be given for the variables' used in all multivariate analyses in order for the reader to better understand each analysis.

The intercorrelation matrix of Harter's perceived competence variables is presented in Table 1. Because 5 variables were mentioned in the first hypothesis, but only 15 participants comprised the AAS-Contemplator group, a decision had to be made as to which of these competence variables should be included in the first discriminant analysis. Social, cognitive, and athletic competence were selected for this first analysis based on their significant intercorrelations as seen above. Variables selected for the second analysis were job and physique competence. No other groups of variables were analyzed given their low intercorrelations.

Table 1

Pearson Product Correlation Coefficients Among Harter's Perceived Competence Subscales

	Social	Cognitive	Job	Athletic	Physique
Social	1.00	.17*	-.06	.26**	-.10
Cognitive		1.00	-.00	.27**	-.01
Job			1.00	.20*	.16*
Athletic				1.00	.09

* $p<.05$. ** $p<.001$.

Hypothesis #1: AAS-Contemplators Will Have Lower Perceived Competence in the Normative Life Domains of Cognitive, Athletic, Job, Physique, and Social Competence Than Any of the Other Groups

Cognitive, athletic, and social competence. As seen from the means in Table 2, the AAS-Noncontemplators revealed the lowest ratings of cognitive and athletic competence and the AAS-Users revealed the lowest ratings of social competence. Of the weightlifting groups, the AAS-Contemplators revealed higher cognitive competence and the AAS-Users possessed greater athletic competence scores than the other subscales. Specifically, AAS-Contemplators and AAS-Noncontemplators reported higher social competence than either the control group or the AAS-User groups.

Results of the discriminant function analysis revealed one significant function, X^2 (9)= 18.78, $p<.05$, in which cognitive competence possessed the highest canonical discriminant coefficient of these 3 competence subscales,

Table 2

Group Centroids, Means, and Standard Deviations for Cogntive, Athletic, and Social Competence

		Group Means and Standard Deviations					
		Cognitive		Athletic		Social	
Groups	Group Centroids	M	SD	M	SD	M	SD
Control	.69	2.41	.28	2.43	.34	2.37	.32
AAS-Contem.	-.05	2.20	.30	2.39	.32	2.44	.30
AAS-Noncontem.	-.17	2.15	.33	2.37	.29	2.41	.28
AAS-User	-.03	2.17	.28	2.41	.31	2.34	.40

Note. Contem. = contemplator.

proving itself to be the best discriminator of the groups (see Table 3). These 3 competence subscales accurately predicted 60.54% of the participants' group membership.

Table 3

Standardized Canonical Discriminant Function Coefficients for Athletic, Social, and Cognitive Competence

	Function 1
Athletic	.04
Cognitive	.99
Social	-.35

Two facts should be noted concerning the interpretation of these results. First, despite being significant , this function explained only 10% of the total

variance (Wilks' Lambda = .90). Second, as can be seen from the means (see Table 2), despite there being some clear group differences, all of the groups revealed moderate levels of cognitive, athletic, and social competence. In fact, all of the groups' means for these variables were below the median of 2.5 on these 4-point scales. In addition, Harter (1986) reported the norms for cognitive, athletic, and social competence as 3.28, 3.00, and 3.16 respectively, among 70 college-aged males. However, Harter's participants, being college-aged, were much younger than the participants used in this study (whose mean age was around 26 years old).

Job competence and physical appearance. Job competence and physical appearance were included in the second discriminant anlysis because of their significant correlation (r=.16, p=.03). While the means (see Table 4) did reflect

Table 4

Group Means and Standard Deviations for Job Competence and Physical Appearance

	Group Means and Standard Deviations			
	Job Competence		Physical Appearance	
Groups	M	SD	M	SD
Control	2.46	.54	2.46	.33
AAS-Contem.	2.31	.33	2.32	.47
AAS-Noncontem.	2.41	.40	2.37	.41
AAS-User	2.34	.32	2.37	.37

Note. Contem. = contemplator.

trends proposed by the hypothesis in which the AAS-Contemplators revealed the lowest job competence and physical appearance scores of the groups, results revealed no significant function, X^2 (6) = 3.52, p=.74. Perhaps with a group size larger than 15, significant results would have emerged. The control group possessed higher job competence and a more favorable perception of their physical appearance than the weightlifting groups. Despite correctly classifying 59.16% of group membership, this discriminant analysis explained only 2% these variables' total variance (Wilks' Lambda = .98).

In sum, results of the discriminant analyses partially supported Hypothesis 1. The AAS-Contemplators did not reveal the lowest competence on any of the competence subscales among all of the groups, although they did reveal significantly lower cognitive and athletic competence than the control group. Also, the AAS-Contemplators did emerge with the lowest, albeit nonsignificant, job competence and physical appearance scores. However, it was the control group that proved themselves to be clearly distinct from the weightlifting groups based mainly on their relatively high cognitive competence scores and also their high athletic competence scores.

Hypothesis #2: The AAS-Contemplators Will Have Lower Global Self-Worth Than Any of the Other Groups

Global self-worth. Because past research has shown self-esteem issues to be central to AAS-use, it was hypothesized that AAS-contemplators would have the lowest global self-worth compared to the other groups. Because Harter (1986) maintains that the construct of self-worth is distinct from self-competence measures, this variable was tested by itself using a Oneway ANOVA. Results revealed no significant differences among the groups, F (3,

187) = .20, p=.89. The means and standard deviations are presented in Table 5. As seen from these means, the groups all revealed similarly low levels of

Table 5

Group Means and Standard Deviations for Global Self-Worth

	Global Self-Worth	
Groups	M	SD
Control	2.30	.24
AAS-Contemplators	2.32	.27
AAS-Noncontemplators	2.30	.29
AAS-Users	2.26	.24

global self-worth with the AAS-Users showing slightly lower scores than the other groups.

The premise of these groups' differences in perceived competencies is believed to be linked to the difference between the participants' actual and desired physical somatotype. As such, the statistical results of participants' body characteristics and goals for their somatotypes will be presented next.

General Physical Descriptors: Weight, Age, and Height

Hypothesis #3: The AAS-User Group Will Be Significantly Heavier Than the Other Groups

Weight. Because AAS has been shown to dramatically increase the amount of muscle on users' bodies, it was hypothesized that the AAS-User group should be significantly heavier than the other groups. A Oneway ANOVA was used to test for group differences on weight and was significant, F (3,188) =

7.60, $p<.001$. Means and standard deviations for weight can be seen in Table 6. Scheffé post-hoc analyses revealed that the AAS- Users did weigh

Table 6

Group Means and Standard Deviations for Weight

	Weight	
Groups	M	SD
Control	174.29	26.88
AAS-Contem.	190.00	28.97
AAS-Noncontem.	190.36	27.67
AAS-User	209.32	31.60

Note. Contem. = Contemplator.

significantly more than each of the other groups thereby supporting this question of interest, $F(3,188) = 7.60$, $p<.05$. No other group differences were significant. The fact that the AAS-Contemplators and AAS-Noncontemplators weighed about the same, nonsignificantly more than the control group and significantly less than the AAS-Users, should be kept in mind when considering the results for the other variables presented in the forthcoming pages.

Age and Height. Of corollary interest were group differences in age and height. It was predicted that since past research (Olrich, 1990) had alluded to AAS-Users being younger than other weightlifters, the AAS-Users and AAS-Contemplators would be younger than the other groups. With respect to height, it was predicted that the AAS-Users and AAS-Contemplators would be shorter than the other groups since common opinion holds that weightlifters determined to add muscle mass do so in an attempt to make up for a short stature.

Inspection of the means (see Table 7) for these variables revealed that the AAS-Users tended to be the oldest weightlifters and the AAS-Contemplators were the shortest. Results of the respective one-way ANOVAs for these variables revealed no significant group differences in terms of age, F (3,188) =1.91, p>.05 or height, F (3,188) =2.47, p>.05.

Table 7

Group Means for Age and Height

	Group Means and Standard Deviations				
	Age			Height in Inches	
Groups	M	SD	Range	M	SD
Control [a]	23.75	7.38	18 - 49	70.79	2.63
AAS-Contem.[b]	24.67	7.18	18 - 42	69.80	2.57
AAS-Noncontem[c]	27.40	9.73	18 - 61	71.31	2.93
AAS-Use[d]	28.26	6.04	20 - 41	70.06	2.73

Note. Contem. = contemplator. [a]n = 28. [b]n = 15. [c]n = 118. [d]n = 31.

Physique Variables

Hypotheses #4 and #5: The AAS-User Group Will Possess a Significantly Larger Bodysize and a Greater Bodysize Differential Than the Other Groups

Body size and body size differential. Because AAS has been shown not only to increase participants' overall weight (as corroborated above), it would seem obvious that increases in weight would be accompanied by increases in girth of participants' arms, chest, and legs. As a topic of interest, it was surmised that of the groups, the AAS-User group would possess a significantly larger body size than the other groups. However, because the AAS-Contemplators

are proposed to be the most psychologically hungry to increase their physical size, this group is believed to possess the greatest body size differential between their actual and desired body size than any of the other groups. Correlations performed between measures of arm, leg, and chest size revealed such high correlation coefficients, in most cases, (see Table 8) that these 3 measures were added together to form 1 measure of body size (aka, Size). The same was true for the measures of goals for arm, leg, and chest size (see Table 9), and these measures were also added together to form 1 measure of one's body size goal (aka, Goal Size).

Table 8

Pearson Product Correlation Coefficients for Arm Size, Leg Size, and Chest Size

	Arm Size	Leg Size	Chest Size
Arm Size	1.00	.72**	.62**
Leg Size		1.00	.50**

** $p<.001$.

Table 9

Pearson Product Correlation Coefficients for Arm Size, Leg Size, and Chest Size Goals

	Goal Arm	Goal Leg	Goal Chest
Goal Arm	1.00	.74**	.49**
Goal Leg		1.00	.43**

** $p<.001$.

Size and goal size. Theoretically, it was felt that the Size and Goal Size variables would better reflect volunteers' current physique state and their motivation to put on muscle mass better than any of their individual components. Because weightlifters often possess different muscle mass goals (one weightlifter may stress arm size while another may stress adding inches to his chest), using a variable which incorporates the three most popular sites of muscular growth (arms, legs, and chest) will even out such differences.

A third variable which reflected the difference between one's Goal Size and one's Size was also used in these analyses and is referred to as one's size difference. In addition, further analyses were conducted on the physique variables that reflect the motives of many weightlifters: To increase upper body size relative to waist size (creating a "V" look). New variables created from the data to examine this motive include participants' chest to waist ratio (Vratio), goal of chest to goal of waist ratio (Goal Vratio), and Vratio subtracted from Goal Vratio (Vratio Difference). The Pearson Product Correlation Coefficients for these physique variables are shown in Table 10.

In order to test the corrollary topic of interest concerning the groups' body size, a discriminant analysis was conducted using the correlated variables of Size and Goal size. Only these two variables were used in this analysis because they were very highly correlated and because only 12 control group members and 13 AAS-Contemplator group members provided complete data sets.

Inspection of the group means for Goal Size and Size (see Table 11) revealed the AAS-Users possessed the greatest body size as well as the goal for the greatest body size. Following the AAS-Users' means for Size and Goal

Table 10

Pearson Product Correlation Coefficients Among Physique Variables

	Size	Goal Size	Vratio	Goal Vratio	Vratio Difference	Size Difference	Body Fat	Waist Size	Goal Waist
Size	1.00	.88**	.54**	.54**	.16*	-.09	.24*	.38**	.24*
Goal Size	-	1.00	.43**	.60**	.37**	.40**	.16	.30**	.20*
Vratio	-	-	1.00	.72**	-.16*	-.10	-.23*	-.42**	-.28**
GoalVratio	-	-	-	1.00	.57**	.22*	-.06	-.15*	-.41**
Vratio Difference	-	-	-	-	1.00	.46**	.26*	.30**	-.25*
Size Difference	-	-	-	-	-	1.00	-.10	-.11	.02
Body Fat	-	-	-	-	-	-	1.00	.47**	.13
Waist Size	-	-	-	-	-	-	-	1.00	.68**

Note. Size = arm size + leg size + chest size (in inches); Goal Size = goal of arm size + goal of leg size + goal of chest size (in inches); Vratio = chest size/waist size; Goal Vratio = goal of chest size/goal of waist size; Vratio Difference = Vratio - Goal Vratio; Size Difference = Goal Size - Size; Body Fat = percentage of body fat; Waist Size = size of waist; and Goal Waist = goal of waist size.

* $p<.05$. ** $p<.001$.

Size, respectively, were the AAS-Contemplators, AAS-Noncontemplators, and the control group. Interestingly, although the AAS-Contemplators were nearly 3 inches smaller than the AAS-Users, their goal body size was only approximately one half inch smaller than the AAS-Users.

Results of the discriminant function analysis revealed one significant function, X^2 (6)= 32.51, $p<.001$, in which Size proved to be the best discriminator of the groups (see Table 12). This function explained 28% of the

total variance (Wilks' Lambda = .72) and accurately predicted 62.50% of group membership.

Table 11

Group Centroids, Means, and Standard Deviations for Size and Goal Size

		Group Means and Standard Deviations			
		Size		Goal Size	
Groups	Group Centroids	M	SD	M	SD
Control	-1.18	75.31	8.37	81.77	7.89
AAS-Noncontem.	-.12	83.69	8.77	91.39	9.81
AAS-Contem.	.53	88.83	8.02	97.67	8.87
AAS-User	.81	91.75	7.01	98.25	8.24

Note. Contem. = contemplator.

Table 12

Standardized Canonical Discriminant Function Coefficients for Size and Goal Size

	Function 1
Size	.75
Goal Size	.29

As can be seen from the group centroids in Table 11, the control group and the AAS-Noncontemplators were significantly differentiated from the AAS-Contemplators and AAS-Users based upon the shared variance of these physique variables, thereby partially supporting the corrollary question pertaining to groups' size. This significant differentiation between these groups

can be attributed to the former two groups possessing lower Size and Goal Size means than the latter two groups.

Size difference and vratio difference. The second corrollary question was investigated by placing the significantly correlated variables Size difference and Vratio difference into a discriminant analysis. Once again, because the control group and the AAS-Contemplators contained only 13 and 12 individuals respectively, only two independent variables could be tested per analysis. Inspection of the means (see Table 13) revealed that the AAS-Contemplators

Table 13

Group Centroids, Means, and Standard Deviations for Size Difference and Vratio Difference

		Group Means and Standard Deviations			
		Size Difference		Vratio Difference	
Groups	Group Centroids	M	SD	M	SD
Control	-1.17	6.46	4.50	.12	.10
AAS-Noncontem.	-.12	7.69	5.63	.14	.10
AAS-Contem.	.54	8.83	4.84	.21	.18
AAS-User	.81	6.50	3.24	.14	.09

Note. Contem. = contemplator.

possessed the greatest difference between their goal and actual size as well as between their goal and actual Vratio. Surprisingly, the AAS-User group possessed practically the same low Size Difference and Vratio Difference scores as the control group.

Results of the discriminant function analysis revealed one significant function, X^2 (6)= 34.96, p<.001, in which Size Difference proved to be the better discriminator of the groups (see Table 14). This function explained 30% of the

Table 14

Standardized Canonical Discriminant Function Coefficients for Size Difference and Vratio Difference

	Function 1
Size Difference	-.46
Vratio Difference	.01

total variance (Wilks' Lambda = .70) and accurately predicted 62.94% of group membership. As can be seen from the group centroids in Table 13, the control group and the AAS-Noncontemplators were significantly differentiated from the AAS-Contemplators and AAS-Users based upon these physique variables, partially supporting the corrollary question pertaining to groups' size differences.

Vratio and goal vratio. A third discrimmint analysis was conducted using the final physique variable Goal Vratio and the variable with which it was most highly correlated, Vratio. Once again, this analysis was limited to these two variables because the control group and the AAS-Contemplator group contained only 13 and 12 individuals, respectively, who possessed complete data sets. Mean (see Table 15) scores revealed the AAS-Contemplators possessed the greatest Goal Vratio scores, followed by the AAS-Users, AAS-Noncontemplators, and the control group. Because Vratio Difference = Goal Vratio - Vratio and the AAS-Contemplators and AAS-Users possessed similar

Table 15

Group Centroids, Means, and Standard Deviations for Vratio and Goal Vratio

		Group Means and Standard Deviations			
		Vratio		Goal Vratio	
Groups	Group Centroids	M	SD	M	SD
Control	-1.09	1.22	.09	1.34	.12
AAS-Noncontem.	-.17	1.32	.13	1.46	.14
AAS-Contem.	1.00	1.42	.14	1.63	.19
AAS-User	.64	1.43	.10	1.56	.10

Note. Contem = contemplator.

Vratio scores, the AAS-Contemplator's possession of the largest Goal Vratio scores was obviously responsible for their large Vratio Difference scores (as seen in the previous discriminant analysis). Another interesting finding is that, despite being sedentary individuals, the control group still desired a larger body size (or at least chest size).

Results of the discriminant analysis revealed one significant function, X^2 (6) = 40.02, $p<.001$, in which Vratio proved to be the best discriminator of the groups (see Table 16). This function explained 27% of the total variance (Wilks' Lambda = .73) and accurately predicted 60.91% of group membership.

Table 16

Standardized Canonical Discriminant Function Coefficients for Vratio and Goal Vratio

	Function 1
Vratio	.98
Goal Vratio	.01

Vratio and body size. Group centroids (see Table 15) revealed that, once again, the control group and the AAS-Noncontemplator group were significantly differentiated from the AAS-Contemplator and AAS-User groups based on these variables. Because Vratio and Size were the top two discrimminators of the groups and were highly and significantly intercorrelated, they were placed into a final discriminant analysis to ascertain which of these two variables was the better discriminator of the groups.

The results of this discrimminant analysis showed one significant function, X^2 (6) = 46.56, $p<.001$, which explained 37% of the total variance (Wilks' Lambda = .63) and correctly classified 66.98% of group membership. The standardized canonical discriminant function coefficients, seen in Table 17,

Table 17

Standardized Canonical Discriminant Function Coefficients for Vratio and Size

	Function 1
Vratio	.36
Size	.52

revealed Vratio and Size contributing to group differences with Size being the best discriminator of the groups. Group means, standard deviations, and group centroids are presented in Table 18. The group centroids revealed the same

Table 18

Group Means, Standard Deviations, and Group Centroids for Vratio and Size

		Group Means and Standard Deviations			
		Vratio		Size	
Groups	Group Centroids	M	SD	M	SD
Control	-1.44	1.22	.09	75.31	8.37
AAS-Noncontem.	-.17	1.32	.13	83.69	8.77
AAS-Contem.	.73	1.42	.14	88.83	8.02
AAS-User	1.11	1.43	.10	91.75	7.01

Note. Contem = contemplator.

trends as the group centroids for the other discriminant analyses performed in this section, namely that the control and AAS-Contemplator groups were significantly differentiated from the AAS-User and AAS-Contemplator groups. This differentiation was primarily due to the strong discrimination power of the Size variable.

Waist size, goal waist, and body fat. Because past research on bodybuilders has shown these individuals to be very conscious in their desire to lose fat and trim their waist to accentuate a "V" taper, these variables were analyzed via discriminant analyses. However, because the AAS-Contemplators only possessed 13 members which answered the questions relating to these variables, only 2 variables could be analyzed at one time.

Thus, 2 sets of discriminant analyses were performed, in which participants' waist size was tested against participants' goal for their waist size (Goal Waist) in the first analysis, and then tested against one's body fat percentage in the second analysis. This was done because waist size was significantly correlated with both Goal Waist and Body Fat (r=.68 and r=.47, respectively).

Mean scores for those variables in the first discriminant analysis (see Table 19), Waist Size and Goal Waist, revealed that the AAS-Noncontemplators

Table 19

Group Centroids, Means, and Standard Deviations for Waist Size and Goal Waist

		Group Means and Standard Deviations			
		Waist Size		Goal Waist	
Groups	Group Centroids	M	S D	M	S D
Control	.10	32.81	2.40	31.81	1.22
AAS-Noncontem.	.16	33.45	2.59	31.98	2.04
AAS-Contem.	-.62	32.07	2.90	30.38	2.22
AAS-User	-.24	32.82	3.08	31.18	2.31

Note. Contem = contemplator.

possessed the greatest waist size and the largest waist size goal while the AAS-Contemplators possessed the smallest measures on these 2 variables. Interestingly, all of the groups desired a smaller waist size by at least one inch from their actual waist size.

Results of the discriminant analysis revealed no significant function, X^2 (6) = 9.39, p>.05. This function explained 7% of the total variance (Wilks' Lambda

= .93) and accurately predicted 59.90% of group membership. Although nonsigificant, Goal Waist proved to be a better discriminator of the groups than Waist Size as seen in Table 20. Mean scores for Waist Size and Body Fat, seen in Table 21, revealed that the control group possessed the least body fat

Table 20

Standardized Canonical Discriminant Function Coefficients for Waist Size and Goal Waist

	Function 1
Waist Size	-.14
Goal Waist	1.09

Table 21

Group Centroids, Means, and Standard Deviations for Waist Size and Body Fat

	Group Means and Standard Deviations			
	Waist Size		Body Fat	
Groups	M	S.D	M	S.D
Control	32.81	2.40	10.81	4.94
AAS-Contem.	32.07	2.90	13.23	6.08
AAS-Noncontem.	33.45	2.59	13.09	5.35
AAS-User	32.82	3.08	12.50	4.00

Note. Contem = contemplator.

percentage overall, while the AAS-Users possessed the least body fat percentage of the weightlifting groups. Surprisingly, the AAS-Contemplators

possessed the greatest body fat percentage and the smallest waist size of the groups.

Results of the discriminant analysis revealed no significant function, X^2 (2) = 2.65, p>.26. This function explained 2% of the total variance (Wilks' Lambda = .98) yet accurately predicted 61.93% of group membership. Lastly, despite being nonsignficant, Waist Size proved to be a better discriminator of the groups than self-reported body fat as seen in Table 22, although both variables contributed to this function.

Table 22

Standardized Canonical Discriminant Function Coefficients for Waist Size and Goal Waist

	Function 1
Waist Size	1.07
Body Fat	-.84

Multidimensional Body-Self Relations Questionnaire (MBRSQ) Variables

Hypothesis #6: The AAS-Contemplators Will Have the Greatest Body Image Disturbances of any of the Other Groups

Body image disturbance. Past studies on AAS-research have suggested that AAS-Users strive to continually put on muscle mass despite their increased mesomorphy because of their inability to accurately perceive their body image (Brower, 1991, 1993a). That is, due to intrapsychic problems, AAS-Users may never see themselves as large enough. However, in this study, it is surmised that it is the AAS-Contemplators who will have the greatest body image

disturbance of any of the other groups as they are believed to be the most determined to put on muscle mass.

Constructed and validated by Cash and Winstead (1983) (see Appendix B for psychometric properties), this scale is normally used to detect individuals' attitudinal dispositions towards the physical self (Cash, 1984) and not to detect body dysmorphic disorder (BDD). However, because there are no scales to-date which do detect BDD and because the MBRSQ is the most widely used and tested scale of this area, it has been used as an indicator of participants' Body Image Concerns (BIC). Thus, while it is impossible to determine BDD in this study, high levels of BIC may indicate participants who are most vulnerable to this disorder. Also, because the MBSRQ contains a number of individual subscales, in addition to several that have been constructed for this study specifically worded for weightlifters, the groups will be tested on these subscales and then compared to the subscales' norms (Cash, 1984). Lastly, as a means of perspective, the subscales of this scale were added together to form one measure of perceived body image and the groups analyzed on this one measure. Since the lowest Cronbach alpha of these subscales was .70 (see Appendix B) and because most of the MBSRQ subscales possess reasonably moderate to high intercorrelations (see Table 23), the principal investigator felt that these scales showed sufficient internal consistency to allow such a meaningful, yet exploratory analysis.

BASS, under weight, and gain weight. Because past AAS-research (Bower, 1992a) has shown that bodybuilders' satisfaction is strongly linked to their desire to gain weight and not lose muscle, the following significantly correlated variables were placed in a discriminant analysis: BASS (Body-Areas

Table 23

Pearson Product Correlation Coefficients for Variables Associated with the Multidimensional Body-Self Relations Questionnaire

	Appearance	Gain Weight	Under Weight	BASS	Self-Muscle	Self-Weight	BIC
Appearance	1.00	.08	-.22**	.66**	.34**	-.27**	-.55**
Gain Weight		1.00	.51**	.05	.18*	-.05	.60**
Under Weight			1.00	-.23**	.13*	.19*	.64**
BASS				1.00	.29**	-.25**	-.54**
Self-Muscle					1.00	.26**	-.42**
Self-Weight						1.00	-.15

Note. Appearance = appearance evaluation; Gain Weight = preoccupation with gaining weight; Under Weight = preoccupation with losing muscle; BASS = Body Areas Satisfaction Scale; Self-Muscle = self-classification of muscle; Self-Weight = self-classification of bodyweight; BIC = body image concerns.

*$p < .05$. **$p < .001$.

Satisfaction Scale), Under Weight (fear of losing weight), and Gain Weight (preoccupation with gaining weight). Although the AAS-Contemplators possessed only 14 participants with complete data sets for these variables, all 3 variables were run together in this one analysis.

Inspection of the means (see Table 24) revealed that despite all of the groups being reasonably satisfied with their bodies, the AAS-User and AAS-Contemplator groups were much more fearful of losing bodyweight and more preoccupied with gaining weight than the control and AAS-Noncontemplator groups. Results of the discriminant function revealed one significant function,

X^2 (9) = 34.00, p<.001, in which one's preoccupation with gaining weight showed the highest canonical discriminant function coefficient (see Table 25).

Table 24

Group Centroids, Means, and Standard Deviations for BASS, Under Weight, and Gain Weight

		Group Means and Standard Deviations					
		BASS		Under Weight		Gain Weight	
Groups	Group Centroids	M	SD	M	SD	M	SD
Control	-.67	3.49	.56	2.16	.82	2.01	.89
AAS-Noncontem.	-.08	3.64	.61	2.30	.61	2.57	.96
AAS-Contem.	.49	3.63	.69	2.63	.75	3.10	1.11
AAS-User	.81	3.59	.54	2.65	.69	3.42	.91

Note. Contem. = contemplator.

Table 25

Standardized Canonical Discriminant Function Coefficients for BASS, Under Weight, and Gain Weight

	Function 1
BASS	.07
Under Weight	.11
Gain Weight	.94

As seen in Table 24, the control group and the AAS-Noncontemplators were significantly discriminated from the AAS-Contemplators and AAS-Users

based on these MBSRQ variables. While these findings are significant in terms of understanding the motives of individuals who are either using or contemplating the use of AAS, it should be noted that this discriminant analysis only explained 17% of the total variance (Wilks' Lambda = .83). However, based solely on these variables, this analysis did correctly classify 64.47% of group membership.

Self-muscle, self-weight, and gain weight. In order to better understand participants' perceptions of their body, a discriminant analysis was performed using other significantly correlated MBRSQ variables: Self-classification of muscle size (Self-Muscle), self-classification of body weight (Self-Weight), and appearance evaluation (Appearance). Inspection of the means (see Table 26)

Table 26

Group Centroids and Means for Self-Muscle, Self-Weight, and Appearance

		Group Means and Standard Deviations					
		Self-Muscle		Self-Weight		Appearance	
Groups	Group Centroids	M	SD	M	SD	M	SD
Control	-.70	3.08	.68	2.93	.58	3.76	.50
AAS-Contem.	-.09	3.43	.70	3.07	.78	3.69	.73
AAS-Noncontem.	.06	3.52	.54	3.10	.54	3.75	.65
AAS-User	.52	3.78	.54	3.24	.49	3.97	.56

Note. Contem. = contemplator.

revealed that the AAS-Users believed themselves to possess the greatest muscle size and heaviest body weight [Cash's (1984) norm, M = 2.96, SD = .62] and felt the most physically attractive of the groups [Cash's (1984) norm, M =

3.49, SD = .83]. Interestingly, the AAS-Contemplators felt the least physically attractive of the groups (yet more attractive than the norms found by Cash) and felt themselves to possess less muscle and body weight than the AAS-Noncontemplators.

Results of the discriminant function revealed one significant function, X^2 (9) = 24.85, $p<.01$, where Self-Muscle proved to be the best discriminator of the groups. Canonical discriminant function coefficients are presented in Table 27.

Table 27

Standardized Canonical Discriminant Function Coefficients for Self-Muscle, Self-Weight, and Appearance

	Function 1
Self-Muscle	.94
Self-Weight	.20
Appearance	-.04

As seen in Table 26, the control group and AAS-Contemplators were significantly discriminated from the AAS-Noncontemplator and AAS-User groups based primarily on the strong discriminating power of Self-Muscle. This discriminant function explained approximately 13% of the total variance (Wilks' Lambda = .87) and correctly predicted 62.94% of participants' group membership based solely on these 3 MBRSQ variables.

As a result of these discriminant analyses on the MBRSQ variables, the hypothesis that the AAS-Contemplators would experience the greatest body image concerns (BIC) is partially supported. Although the AAS-Contemplators did reveal the lowest appearance evaluation scores, second highest scores in

fearing weight loss and in preoccupation with gaining weight, as well as second lowest scores in self-perception of body musculature and body weight, they did not statistically differ from the AAS-Users.

BIC, body size, and cognitive competence. In an attempt to obtain one measure of BIC as a means of getting an overall perspective on groups' BIC differences, the 5 MBRSQ measures used in this study were added together and divided by 5 (1 = low BIC, 5 = high BIC). This new variable, BIC, was then compared to the best discriminating variables obtained from the previous discriminant analyses (Size and Cognitive) to ascertain BIC's relative discriminating power. The means, standard deviations, and group centroids for these variables are presented in Table 28. Since the variables for size and

Table 28

Group Centroids, Means, and Standard Deviations for BIC, Size, and Cognitive Competence

		Group Means and Standard Deviations					
		Size		BIC		Cognitive	
Groups	Group Centroids	M	SD	M	SD	M	SD
Control	-1.23	75.31	8.37	2.46	.31	2.41	.28
AAS-Noncontem.	-.11	83.69	8.77	2.49	.35	2.15	.33
AAS-Contem.	.63	88.83	8.02	2.63	.32	2.20	.30
AAS-User	.91	91.75	7.01	2.60	.36	2.17	.28

Note. Contem. = contemplator.

cognitive competence have already been discussed, the variable of BIC will be examined here. The means revealed the weighlifting groups possessed

greater BIC scores than the control group, with the AAS-Contemplators possessing the greatest overall BIC, followed by the AAS-Users, and the AAS-Noncontemplators.

The results of the discrimminant analysis revealed one significant function, X^2 (9)= 34.41, p<.001, in which participants' Size proved to be the strongest discriminator of the groups (see Table 29). The group centroids presented in Table 28 show the AAS-Contemplators and AAS-Users to be significantly

Table 29

Standardized Canonical Discriminant Function Coefficients for Size, BIC, and Cognitive Competence

	Function 1
Size	.92
BIC	.46
Cognitive	-.27

discriminated from the AAS-Noncontemplators and the control group. This discriminant function accounted for 30% of the total variance (Wilks' Lambda = .70) and correctly classified 59% of group membership.

Interim Summary. Results of the discriminant analysis for the Underweight and Gainweight variables revealed that the AAS-Contemplators and AAS-Users were differentiated significantly from the AAS-Noncontemplators and the Control Group. That is, those weightlifters either contemplating or using AAS were more fearful of losing muscle mass and wanted to gain more muscle mass than nonexercisers or than those weightlifters not involved with AAS. A discriminant analysis on the Self-Muscle and Self-Weight variables showed that

the AAS-Noncontemplators and AAS-Users were differentiated significantly from the AAS-Contemplators and the Control Group. More specifically, the AAS-Noncontemplators and the AAS-Users possessed more positive perceptions of their overall musculature and body weight than the AAS-Contemplators and the Control Group. In terms of appearance evaluation, all groups revealed positive perceptions of their bodies, with the AAS-Contemplators showing a nonsigificantly lower body evaluation than the other groups. Because the AAS-Contemplators did reveal greater body image concerns, as indicated by the aforementioned variables, than some of the other groups, the MBSRQ hypothesis was partially supported. However, in order to obtain an understanding of the groups' overall BIC differences, further analyses were conducted.

While BIC did not prove to be the greatest discriminator of the groups, it does provide a decent overview of participants' body image concerns. As such, further analyses were conducted using the BIC measure to discriminate individuals with high, medium, and low BIC on the other psychosocial and situational variables used in this study. In doing this, participants were considered to have high or low BIC if they were 1 standard deviation above or below the mean for BIC, respectively. Participants scoring between plus and minus one standard deviation were considered to have medium BIC. Of the 82 participants who possessed either high or medium BIC, 12 of them (approximately 15%) were AAS-users, 8 of them (approximately 10%) were AAS-contemplators, 57 of them (approximately 70%) were AAS-noncontemplators, and 5 of them (approximately 5%) were from the control

group. In sum, slightly greater than one half of the AAS-contemplator group and one third of the AAS-user groups possessed either medium or high BIC.

BIC Analyses

Age, weight, and height. In order to test for differences among BIC groups on age, weight, and height, 3 ANOVAs were conducted. Results revealed no significant differences among the groups on these 3 variables, F (2, 174) = .19, $p > .05$, F (2, 174) = .04, $p > .05$, and F (2, 174) = 2.73, $p > .05$, respectively. The means for these three variables are presented in Table 30. The fact that these

Table 30

BIC Group Means for Age, Weight, and Height

	Group Means and Standard Deviations					
	Age		Weight in Pounds		Height in Inches	
Groups	M	SD	M	SD	M	SD
Low BIC	26.75	9.23	191.12	28.86	71.42	3.28
Medium BIC	26.93	9.01	191.58	27.87	70.85	2.26
High BIC	25.71	6.39	193.00	33.99	70.04	1.95

groups did not differ significantly on these variables is very interesting in itself. Apparently, participants body image concerns did not depend on their actual age, weight, or height.

Hourlift, yearlift, strength, and preweigh. Considering that individuals possess differing levels of concerns for their body image, it would seem to follow that these individuals would also differ on the amount of effort they put into their weightlifting. As such, Oneway ANOVAs were conducted on the number of hours and years spent weightlifting, strength levels, and body weight

prior to the initiation into weightlifting for these BIC groups. Means for these groups, presented in Table 31, did reveal hypothesized trends. That is, the greater participants' body image concerns, the more hours they spent in the gym per week weight training. Results revealed no significant differences for hourlift, yearlift, strength, and preweigh, F (2, 149) = 1.84, $p > .05$, F (2, 149) = 1.41, $p > .05$, F (2, 95) = .07, $p > .05$, and F (2, 147) = 1.73, $p > .05$, respectively.

Table 31

BIC Group Means for Hourlift, Yearlift, Strength, and Preweigh

	Group Means and Standard Deviations							
	Hourlift		Yearlift		Strength		Preweigh	
Groups	M	SD	M	SD	M	SD	M	SD
Low BIC	6.54	3.48	7.96	6.67	1283.62	456.91	159.63	28.11
Medium BIC	6.80	2.69	6.39	7.01	1251.21	410.62	169.12	32.53
High BIC	7.85	2.57	5.96	4.21	1253.33	419.37	157.65	30.41

Cognitive, social, and athletic competence. BIC groups were analyzed on Harter's (1986) perceived competence subscales. The means for the significantly correlated measures of cognitive, social, and athletic competence are presented in Table 32. The means for these variables show trends that run contrary to intuition. Individuals with higher levels of BIC possessed higher cognitive, social, and athletic perceived competence than individuals with lower levels of BIC.

Results of the discriminant analysis revealed one significant function, X^2 (6)= 19.31, $p<.05$, in which social competence possessed the highest canonical discriminant function coefficient of these three competence measures, proving

itself to be the best discriminator of the groups (see Table 33). As such, the strong discriminative ability of this variable was the main reason behind the group centroid trends (see Table 32), which revealed the low BIC group to be

Table 32

BIC Group Means for Cognitive, Social, and Athletic Competence

		Group Means and Standard Deviations					
		Cognitive		Social		Athletic	
Groups	Group Centroids	M	SD	M	SD	M	SD
Low BIC	-.32	2.15	.29	2.31	.28	2.33	.26
Medium BIC	.30	2.24	.32	2.49	.29	2.40	.33
High BIC	.47	2.30	.34	2.51	.37	2.45	.29

Table 33

Standardized Canonical Discriminant Function Coefficients for Athletic, Social, and Cognitive Competence

	Function 1
Athletic	.14
Cognitive	.37
Social	.82

significantly differentiated from the higher BIC groups. Based solely on these competence measures, 58.48% of participants' group membership was correctly classified and 11% of these variables' total variance was accounted for (Wilks Lambda = .89).

Physique and job competence and global self-worth. A second discriminant analysis was conducted on the significantly correlated measures of physique and job competence along with global self-worth. Means for these subscales, presented in Table 34, revealed that the low BIC group

Table 34

BIC Group Means for Physique Competence, Job Competence, and Global Self-Worth

		Group Means and Standard Deviations					
		Physique		Job		Global Self-Worth	
Groups	Group Centroids	M	S.D	M	S.D	M	S.D
Low BIC	.40	2.53	.37	2.39	.37	2.26	.27
Medium BIC	-.48	2.22	.40	2.40	.42	2.34	.26
High BIC	-.34	2.24	.35	2.29	.32	2.32	.31

possessed higher physique competence yet lower Global Self-Worth than the higher BIC groups. Also, the high BIC group showed the lowest job competence than the other groups.

Results of the discriminant analysis revealed one significant function, X^2 (6)= 29.36, $p<.05$, in which physique competence possessed the highest canonical discriminant function coefficient of these 3 measures, proving itself to be the best discriminator of the groups (see Table 35). Thus, the strong discriminative ability of this variable was the main reason behind the group centroid trends (see Table 34), which revealed the low BIC group to be significantly differentiated from the higher BIC groups. Based solely on these competence measures, 55.75% of participants' group membership was

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correctly classified and 16% of these variables' total variance was accounted for (Wilks Lambda = .84).

Table 35

Standardized Canonical Discriminant Function Coefficients for Physique Competence, Job Competence, and Global Self-Worth

	Function 1
Physique	.98
Job	-.15
Global	-.21

Physique and social competence. The fact that perceived physique competence was the greatest discrimminator of these three variables made sense. Individuals with varying levels of body image evaluations would also seem to possess disparate levels of physique competence. In order to ascertain whether physique competence was the strongest group differentiator of all Harter's (1986) variables, a discriminant analysis was conducted between social competence (the strongest discriminator in the first BIC discriminant analysis) and physique competence. Results of this dicriminant analysis showed one significant function, X^2 (4) = 44.86, $p < .01$ with physique competence being the best discriminator of the groups (see Table 36). In this discriminant analysis, 23% of the physique and social competence subscales were accounted for (Wilks Lambda = .77) and 60.80% of the groups were correctly classified.

Table 36

Standardized Canonical Discriminant Function Coefficients for Physique Competence and Social Competence

	Function 1
Physique	.82
Social	-.58

Size, vratio difference, and size difference. Further discriminant analyses were conducted using the physique variables. In the first discriminant analysis, BIC groups' size, Vratio difference, and size difference were used. Means for these variables, presented in Table 37, reveal that while the medium BIC group possessed the greatest body size and Vratio, it was the high BIC group that had the greatest size differential between their actual and goal body size.

Table 37

BIC Group Means for Size, Vratio Difference, and Size Difference

		Group Means and Standard Deviations					
		Size		Vratio Difference		Size Difference	
Groups	Group Centroids	M	SD	M	SD	M	SD
Low BIC	-.41	83.76	8.59	.12	.09	5.70	4.81
Medium BIC	.45	86.10	7.70	.19	.15	9.30	5.50
High BIC	.41	83.82	14.44	.16	.08	9.76	3.44

Results of the discriminant analysis revealed one significant function, X^2 (6)= 16.88, $p<.01$, in which Size Difference possessed the highest canonical

discriminant function coefficient of these 3 measures, proving itself to be the best discriminator of the groups (see Table 38). Thus, the strong discriminative

Table 38

Standardized Canonical Discriminant Function Coefficients for Size, Vratio Difference, and Size Difference

	Function 1
Size	.26
Vratio Difference	.27
Size Difference	.84

ability of this variable was the main reason behind the group centroid trends (see Table 37), which revealed the low BIC group to be significantly differentiated from the higher BIC groups. Based solely on these physique measures, 56.70% of participants' group membership was correctly classified and 17% of these variables' total variance was accounted for (Wilks Lambda = .83).

Vratio, body fat, and waist size. A second discriminant analysis was conducted using the signficantly correlated physique variables of Vratio, body fat percentage, and Waist Size. Means for these variables, presented in Table 39, revealed that the high BIC group possessed the highest body fat percentage yet had the smallest waist size. In addition, the medium BIC group possessed the greatest Vratio and waist size, which makes sense given that they also possess the greatest size of all 3 groups.

Results of the discriminant analysis revealed one significant function, X^2 (6)= 13.62, $p<.05$, in which body fat possessed the highest canonical

discriminant function coefficient of these measures, proving itself to be the best discriminator of the groups (see Table 40). Thus, the strong discriminative ability of Body Fat was the main reason behind the group centroid trends (see Table 39), which revealed the low BIC group to be significantly differentiated from the higher BIC groups. Based solely on these physique measures, 55.14% of participants' group membership was correctly classified and 12% of these variables' total variance was accounted for (Wilks' Lambda = .88).

Table 39

BIC Group Means for Vratio, Body Fat, and Waist Size

		Group Means and Standard Deviations					
		Vratio		Body Fat		Waist Size	
Groups	Group Centroids	M	SD	M	SD	M	SD
Low BIC	-.32	1.33	.13	11.83	4.29	33.27	2.31
Medium BIC	.20	1.34	.13	14.20	5.53	33.34	2.92
High BIC	.57	1.32	.13	14.89	5.72	32.61	2.97

Table 40

Standardized Canonical Discriminant Function Coefficients for Vratio, Body Fat, and Waist Size

	Function 1
Vratio	-.02
Body Fat	1.13
Waist Size	-.76

Goal vratio, goal size, and goal waist. The last discriminant analysis conducted with the physique variables included participants' Vratio goal, body size goal, and waist size goal. The means for these variables, presented in Table 41, revealed that the medium BIC group possessed the greatest Goal

Table 41

BIC Group Means for Goal Vratio, Goal Size, and Goal Waist

		Group Means and Standard Deviations					
		Goal Vratio		Goal Size		Goal Waist	
Groups	Group Centroids	M	SD	M	SD	M	SD
Low BIC	-.33	1.44	.14	89.49	9.76	32.06	2.15
Medium BIC	.39	1.54	.17	95.76	6.94	31.61	2.01
High BIC	.24	1.48	.17	93.59	14.93	31.53	2.10

Vratio and Goal Size. Both the medium and high BIC groups possessed a greater desire to increase their Vratio and their body size and decrease their waistline than the low BIC group. Also, one should note the very large standard deviation surrounding the high BIC group's Goal Size relative to the other groups. This indicates that some individuals in this group desire to be much bigger or smaller than this group's mean Goal Size.

Results of the discriminant analysis revealed one significant function, $X^2(6)= 12.82$, $p<.05$, in which Goal Size possessed the highest canonical discriminant function coefficient of these measures, proving itself to be the best discriminator of the groups (see Table 42). Thus, the strong discriminative ability of Body Fat was the main reason behind the group centroid trends (see Table 41), which revealed the low BIC group to be significantly differentiated from the

higher BIC groups. Based solely on these physique measures, 56.44% of participants' group membership was correctly classified and 12% of these variables' total variance was accounted for (Wilks Lambda = .88).

Table 42

Standardized Canonical Discriminant Function Coefficients for Goal Vratio, Goal Size, and Goal Waist

	Function 1
Goal Vratio	-.18
Goal Size	1.10
Goal Waist	-.67

AAS-Attitude, AAS-intention, AAS-find, and peer. The first discriminant analysis conducted using the Steroid Variable Questionnaire included the significantly correlated variables of participants' attitude towards AAS, intention to use AAS, ability to find AAS, and peer pressure to gain muscle mass. The means for these variables, presented in Table 43, revealed that the high BIC

Table 43

BIC Group Means for AAS-Attitude, AAS-Intention, AAS-Find, and Peer

		Group Means and Standard Deviations							
		AAS-Attitude		AAS-Intention		AAS-Find		Peer	
Groups	Group Centroids	M	SD	M	SD	M	SD	M	SD
Low BIC	-.36	1.97	.90	1.54	.89	3.41	1.24	2.38	.72
Medium BIC	.24	2.43	1.05	2.14	1.15	3.51	1.03	2.65	.70
High BIC	.72	2.60	1.07	2.23	1.10	3.64	1.21	3.08	.76

group, followed by the medium BIC group, and then the low BIC group possessed the most positive attitude towards AAS, the greatest intent to use AAS in the future, the strongest belief in being able to find AAS, and the most peer pressure to put on muscle mass.

Results of the discriminant analysis revealed one significant function, X^2 (8)= 27.79, $p<.01$, in which Peer possessed the highest canonical discriminant function coefficient of these measures, proving itself to be the best discriminator of the groups (see Table 44). Thus, the strong discriminative ability of Peer was

Table 44

Standardized Canonical Discriminant Function Coefficients for AAS-Attitude, AAS-Intention, AAS-Find, and Peer

	Function 1
AAS-Attitude	.26
AAS-Intention	.38
AAS-Find	-.06
Peer	.70

the main reason behind the group centroid trends (see Table 43), which revealed the low BIC group to be significantly differentiated from the higher BIC groups. Based solely on these physique measures, 58.44% of participants' group membership was correctly classified and 17% of these variables' total variance was accounted for (Wilks Lambda = .83).

Listen, approve, and peer. A second discriminant analysis was conducted using the significantly correlated variables of the desire to listen to significant others' opinions concerning AAS-use, perception that significant others' would

approve of their AAS-use, and peer pressure to put on muscle mass. Peer, which was used in the previous discriminant analysis, was used again in this discriminant analysis because of its significant correlation with these other variables and because of the conceptual assumption that these variables all revolve around the social impact of others on participants' AAS intentions. The means for these variables, presented in Table 45, revealed that while all 3

Table 45

BIC Group Means for Listen, Approve, and Peer

		Group Means and Standard Deviations					
		Listen		Approve		Peer	
Groups	Group Centroids	M	SD	M	SD	M	SD
Low BIC	-.24	2.83	.52	1.86	.63	2.39	.72
Medium BIC	.11	2.81	.56	1.96	.52	2.63	.71
High BIC	.59	2.78	.43	2.06	.70	2.98	.85

groups were equally likely to listen to significant others' opinions of AAS-use, the high and medium BIC groups were more likely to perceive significant others' approval of their AAS-use and were more likely to feel peer pressure to put on muscle mass.

Results of the discriminant analysis revealed one significant function, X^2 (6)= 13.23, $p<.05$, in which Peer possessed the highest canonical discriminant function coefficient of these measures, proving itself to be the best discriminator of the groups (see Table 46). Thus, the strong discriminative ability of Peer was the main reason behind the group centroid trends (see Table 45), which revealed the low BIC group to be significantly differentiated from the higher BIC

groups. Based solely on these Steroid Variable Questionnaire (SVQ) measures, 55.92% of participants' group membership was correctly classified and 9% of these variables' total variance was accounted for (Wilks Lambda = .91).

Table 46

Standardized Canonical Discriminant Function Coefficients for Listen, Approve, and Peer

	Function 1
Listen	-.12
Approve	.28
Peer	.91

Context and weightlifting dissatisfaction. The final discriminant analysis of the SVQ variables included using the significantly correlated variables of the gyms' contextual pressure to add muscle mass and participants' weightlifting dissatisfaction. The means for these variables, presented in Table 47, revealed

Table 47

BIC Group Means for Context and Weightlifting Dissatisfaction

		Group Means and Standard Deviations			
		Context		Weightlifting Dissatisfaction	
Groups	Group Centroids	M	SD	M	SD
Low BIC	-.31	3.09	.58	3.49	.66
Medium BIC	.19	3.38	.63	3.27	.85
High BIC	.63	3.68	.71	3.30	.65

that the high BIC group, followed by the medium BIC group, and then the low BIC group possessed high Context scores, indicating that the higher participants' body image concerns were, the more pressure to put on muscle mass they perceived from the context of their gym. That is, the less favorable participants perceive their body image, the more influenced they are to put on muscle mass by the size and intensity of training of other gym members. However, it was the low BIC group which possessed more weightlifting dissatisfaction.

Results of the discriminant analysis revealed one significant function, X^2 (4)= 20.18, $p<.01$, in which Context possessed the highest canonical discriminant function coefficient of these measures, proving itself to be the best discriminator of the groups (see Table 48). Thus, the strong discriminative ability

Table 48

Standardized Canonical Discriminant Function Coefficients for Context and Weightlifting Dissatisfaction

	Function 1
Weightlifting Dissatisfaction	-.24
Context	.94

of Context was the main reason behind the group centroid trends (see Table 47), which revealed the low BIC group to be significantly differentiated from the higher BIC groups. Based solely on these SVQ measures, 57.32% of participants' group membership was correctly classified and 12% of these variables' total variance was accounted for (Wilks Lambda = .88).

Context, physique competence, size difference, and goal size. In order to ascertain which of the aforementioned variables best discriminated groups, one final discriminant analysis was conducted using the strongest competence (Physique), physique (Size Difference and Goal Size), and SVQ (Context) variables in their respective analyses. Results revealed that Size Difference followed by Physique and Context provided the best discriminative ability (see Table 49). This analysis revealed one significant function, X^2 (9) = 25.10, p <

Table 49

Standardized Canonical Discriminant Function Coefficients for Context, Physique, Size Difference, and Goal Size

	Function 1
Context	.34
Physique	-.52
Size Difference	.61
Goal Size	.08

Table 50

BIC Group Means for Context, Physique, Size Difference, and Goal Size

		Group Means and Standard Deviations							
		Context		Physique Competence		Size Difference		Goal Size	
Groups	Group Centroids	M	SD	M	SD	M	SD	M	SD
Low BIC	-.51	3.09	.58	2.53	.37	5.70	4.81	89.49	9.76
Medium BIC	.51	3.38	.63	2.22	.40	9.30	5.50	95.76	6.94
High BIC	.65	3.68	.71	2.24	.35	9.76	3.44	93.59	14.93

.05, accounted for 26% of the variance (Wilks' Lambda = .74), and correctly predicted 65.52% of the group membership. Similar to the previous discriminant analyses findings, results revealed the low BIC group to be significantly discriminated from the medium and higher BIC groups (see Table 50).

Interim summary. Participants' revealed different goals, perceptions, and characteristics depending on their body image concerns (BIC). Although BIC groups did not differ on age, weight, height or on such weightlifting characteristics as Hourlift, Yearlift, Strength, or Preweigh, they did show differences on Harter's (1986) Perceived Competence measures, on physique measurements, goals for their physique, and SVQ variables. More specifically, medium and high BIC groups were significantly differentiated from low BIC groups on cognitive, social, athletic, job, and physique competence as well as global self-worth. Interestingly, the higher BIC groups revealed a more positive perceived competence profile, scoring significantly higher on all of these measures except for physique competence. However, physique competence did reveal the best discriminative ability of the perceived competence measures, indicating that the significantly lower perceived physique competence of the medium and high BIC groups was the most potent differentiator of the groups.

Findings for the physique variables revealed the low BIC groups to be smaller and possessing of goals for smaller body size gains than the higher BIC groups. In addition, despite being larger than their low BIC counterparts, the medium and high BIC group members perceived AAS more favorably, believed they could find AAS more easily, believed the gym and their peers to be more

influential to gain muscle mass, had less weightlifting dissatisfaction, and possessed a stronger intent to use AAS in the future than the low BIC group. Lastly, the higher BIC groups were found to believe that their parents, family, and significant other(s) would more favorably approve of their AAS-use than the low BIC group.

With this section ends the ability to compare all 4 groups on all variables, as some variables in this study are exclusive to the weightlifting groups. Thus, the following sections of nonexploratory analyses will deal with those characteristics specific to the weightlifting groups.

Weightlifting Questionnaire Variables: Body, Strength, and Weightlifting Experience Among Weightlifting Groups

Since so much of this dissertation revolves around participants' perceived differences on many psychosocial and situational variables, it was of topical interest to this study to examine the actual differences among the weightlifting groups in terms of a variety of body size, strength, and weightlifting experience measures. Because they are using ergogenic drugs, it was surmised that the AAS-Users would be the strongest of all the weightlifting groups. Although AAS has been shown to increase the body's recuperative effects and allow individuals' to train harder and longer than nonusers, it was thought that the intense desire to add muscle mass would drive the AAS-Contemplators to train longer over the course of the week than the AAS-Users.

Because the 3 strength variables used in this study, the most weight lifted for 1 repetition in the past month on the bench press (Bench Rep.), squat (Squat Rep.), and leg press (Leg Rep.) were very highly correlated (see Table 51), these variables were added together to give one measure of strength (aka,

Table 51

Pearson Product Correlation Coefficients for Bench Repetition, Squat Repetition, and Leg Repetition

	Bench Rep.	Squat Rep.	Leg Rep.
Bench Rep.	1.00	.74**	.64**
Squat Rep.		1.00	.76**

Note. Rep. = Repetition.

** $p<.001$.

Strength). The same was true for the variables associated with individuals' all time personal strength records on these weightlifting exercises, and so these variables were aggregated to give one measure of one's all time best strength record (aka, Best Strength) (see Table 52). The Pearson Product Correlation Coefficient Matrix of these newly computed variables as well as the other weightlifting variables is presented in Table 53.

Table 52

Pearson Product Correlation Coefficients for Best Bench Press, Best Squat, and Best Leg Press

	Best Bench Press	Best Squat	Best Leg Press
Best Bench Press	1.00	.79**	.69**
Best Squat		1.00	.78**

** $p<.001$.

Table 53

Pearson Product Correlation Coefficients for Weightlifting Variables

	Preweigh	Yearlift	Hourlift	Compbefore	Compfuture	Strength	Beststrg
Preweigh	1.00	-.21**	-.00	.17*	.07	-.16*	-.23**
Yearlift		1.00	.04	-.19**	-.04	.21*	.32**
Hourlift			1.00	-.18**	-.23**	.29**	.26**
Compbef				1.00	.53**	-.42**	-.50**
Compfutr					1.00	-.35**	-.36**
Strength						1.00	.92**

Note. Preweigh = bodyweight prior to initiating weightlifting; Yearlift = amount of years spent weightlifting; Hourlift = amount of hours spent weightlifting per week; Compbefore = whether one has competed before in a bodybuilding, powerlifting, or Olympic Weightlifting competition before; Compfuture = whether one is planning on competing in a bodybuilding, powerlifting, or Olympic Weightlifting competition in the future; Strength = amount of weight one has lifted in the past month on the bench press + leg press + squat; Beststg = most amount of weight one has lifted on the bench press + leg press + squat.

*$p < .05$. **$p < .001$.

Hypothesis #7: AAS-Users Will Be Stronger Than the Other Weightlifting Groups

Hypothesis #8: AAS-Contemplators Will Train the Longest Over the Week Than the Other Weightlifting Groups

Hypothesis #9: There Will Be No Difference Among the Weightlifting Groups in Terms of How Many Years They Have Been Weightlifting

Yearlift, hourlift, and strength. Because the length of one's weightlifting career (Yearlift) and the amount of hours one trains per week (Hourlift) is thought to impact how strong one is (Strength), these three significantly

correlated weightlifting variables were included in a discriminant analysis. Inspection of the means (see Table 54) revealed that the AAS-Users were the

Table 54

Group Centroids, Means, and Standard Deviations for Hourlift, Strength, and Yearlift

		Group Means and Standard Deviations					
		Hourlift		Strength		Yearlift	
Groups	Group Centroids	M	SD	M	SD	M	SD
AAS-Noncontem.	-.33	6.60	3.00	1121.62	369.05	7.31	6.60
AAS-Contem.	.07	7.08	2.97	1311.25	295.78	4.12	2.51
AAS-User	1.04	8.68	3.00	1635.91	520.32	9.64	4.96

Note. Contem. = contemplator.

strongest, trained more hours per week, and had more years of weightlifting experience of all the weightlifting groups. The AAS-Contemplators, although stronger and lifting more hours per week than the AAS-Noncontemplators, had less weightlifting experience than the AAS-Noncontemplators.

Results of this discriminant function analysis revealed one significant function, X^2 (6)= 31.91, $p<.001$, in which participants' strength levels proved to be the strongest discriminator of the groups (see Table 55). The group centroids, presented in Table 54, revealed the AAS-Noncontemplators to be signficantly discriminated from the other 2 weightlifting groups based on these 3 weightlifting variables. Thus, hypotheses seven and eight, that the AAS-Users would be the strongest and the AAS-Contemplators would train the longest over the course of a week, were partially supported, as these groups differed

Table 55

Standardized Canonical Discriminant Function Coefficients for Hourlift, Strength, and Yearlift

	Function 1
Hourlift	.31
Strength	.86
Yearlift	.11

significantly from the AAS-Noncontemplators but they did not significantly differ from each other. Lastly, this significant function explained 27% of the total variance (Wilks' Lambda = .73), and correctly classified 69.52% of group membership.

Because there was such a dramatic difference in weightlifting experience between the AAS-Users and the other groups, it was uncertain whether strength and size differences between these groups were due to this weightlifting experience or to some other reasons, such as AAS-use. Thus, a one-way MANCOVA was conducted in which group differences in strength and size were tested while covarying out the number of years they have been weighlifting (Yearlift). Results revealed a nonsignficant omnibus test, F (2, 65) = .151, p >.05, indicating that the differences among groups in strength and size could not be attributed to the number of years spent weightlifting.

Hypothesis #10: The AAS-Noncontemplators Will Have Been Heavier Than the Other Weightlifting Groups Before They Started Weightlifting

Participants' weight levels prior to initiating weightlifting. Another corrollary topic of interest in this study concerned how heavy the participants were prior to

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their initiation into weightlifting. Because Olrich (1990) found that AAS-Users were lighter in comparison to their peers prior to their introduction to weightlifting, it was surmised that the AAS-Noncontemplators would be heavier than the other weighlifting groups before they started weightlifting. Because it is thought that individuals' of smaller stature end up lifting more hours per week and have longer weightlifting careers than individuals' of larger stature, the variables of Preweigh, Yearlift, and Hourlift were included in a discriminant analysis.

Inspection of the means, presented in Table 56, showed that the AAS-

Table 56

Group Centroids, Means, and Standard Deviations for Hourlift, Preweigh, and Yearlift

		Group Means and Standard Deviations					
		Hourlift		Preweigh		Yearlift	
Groups	Group Centroids	M	SD	M	SD	M	SD
AAS-Contem.	-.13	7.08	2.97	151.50	33.01	4.12	2.51
AAS-Noncontem.	-.18	6.60	3.00	164.49	30.20	7.31	6.60
AAS-User	.74	8.68	3.00	152.65	26.57	9.64	4.96

Note. Contem. = contemplator.

Noncontemplators weighed the most prior to initiating weightlifting. The AAS-Contemplators and AAS-Users weighed similarly less than the AAS-Noncontemplators before they started weightlifting. The variables of hourlift and yearlift have already been discussed in a prior discriminant analysis and therefore they will not be discussed here.

Results of the discriminant function revealed one significant function, X^2 (6)= 24.71, $p<.001$, in which the amount of time participants spent weightlifting per week proved to be the strongest discriminator of the groups (see Table 57).

Table 57

Standardized Canonical Discriminant Function Coefficients for Hourlift, Preweigh, and Yearlift

	Function 1
Hourlift	.79
Preweigh	-.33
Yearlift	.48

This function explained 14% of the total variance (Wilks' Lambda = .86) and correctly classified 73.62% of group membership. The group centroids, presented in Table 56, revealed the AAS-Noncontemplators to be significantly discriminated from the other weightlifting groups, thereby supporting the notion tha the number of hours spent lifting per week plus the number of years spent lifting weights are essential variables in discriminating AAS-Users and AAS-Contemplators from AAS-Noncontemplators.

Prior and future weightlifting competitions. The final weightlifting variables of interest, included whether participants have competed in some sort of weightlifting contest (e.g., bodybuilding, powerlifting, or Olympic Weightlifting competitions) before (Compbefore) or plan to compete in the future (Compfuture), were analyzed using nonparametric analyses. A 2 (yes, no response) by 3 (AAS-Noncontemplators, AAS-Contemplators, AAS-Users) chi square analysis was followed by pairwise odds ratios and risk analyses in order

to ascertain which and to what extent the weightlifting groups differed on each of these variables.

The results for Compbefore revealed a significant chi square, X^2 (2) = 17.82, $p < .001$, indicating that the weightlifting groups differed significantly in their weightlifting competition history (see Table 58 for observed and expected values). Follow-up chi square analyses among the weightlifting groups on this variable are presented in Table 59.

Table 58

Observed and Expected Values for Compete-Before for the Weightlifting Groups

	AAS-Contemplators		AAS-Noncontemplators		AAS-Users	
Competed Before	Observed	Expected	Observed	Expected	Observed	Expected
Yes	5	3.3	17	26.7	15	6.9
No	10	11.7	103	93.3	16	24.1

Table 59

Follow-Up Chi Square Tests for Compete-Before Among Weightlifting Groups

	AAS-Contemplators	AAS-Noncontemplators	AAS-User
AAS-Contemplators	—	3.59	.93
AAS-Noncontemplators		—	17.27**

** $p < .001$

Results of the follow-up chi square analyses for Compbefore (see Table 59), indicated that the AAS-User group had competed in weightlifting competitions significantly more than the AAS-Noncontemplators. In order to

understand the magnitude of this difference, a risk analysis was conducted. Results of this analysis revealed that the odds ratio (response ratio) of the AAS-Noncontemplator to the AAS-Users was .18 to 1 indicating that the AAS-Noncontemplators were .18 times more likely not to have participated in weightlifting competitions than the AAS-Users. Conversely, the AAS-Users were (1/.18) 5.64 times more likely to have participated in weightlifting competitions than the AAS-Noncontemplators.

Results for Compfuture revealed a significant chi square, X^2 (2) = 29.69, $p < .001$, indicating that groups differed significantly in terms of their intention to participate in weightlifting competitions in the future. The observed and expected values for the weightlifting groups on this variable are presented in Table 60 while the follow-up chi square analysis is presented in Table 61.

Table 60

Observed and Expected Values for Compete-Future for the Weightlifting Groups

	AAS-Contemplators		AAS-Noncontemplators		AAS-Users	
Compete in Future	Observed	Expected	Observed	Expected	Observed	Expected
Yes	9	4.5	21	35.3	19	9.2
No	6	10.5	98	83.7	12	21.8

Results of the follow-up chi square analyses for Compfuture (see Table 61) indicated that the AAS-User group and the AAS-Contemplators were significantly more likely to plan on competing in weightlifting competitions in the future than the AAS-Noncontemplators. In order to understand the magnitude of these differences, risk analyses were conducted. Results of these analyses revealed that the odds ratio (response ratio) of the AAS-Noncontemplator to the

Table 61

Follow-Up Chi Square Tests for Compete-Future Among Weightlifting Groups

	AAS-Contemplators	AAS-Noncontemplators	AAS-User
AAS-Contemplators	—	13.75**	.007
AAS-Noncontemplators		—	23.95**

** $p < .001$

AAS-Users was .14 to 1 indicating that the AAS-Noncontemplators were .14 times more likely to not plan on participating in weightlifting competitions in the future than the AAS-Users. Conversely, the AAS-Users were (1/.14) or 7.14 times more likely to plan on participating in weightlifting competitions in the future than the AAS-Noncontemplators. Also, the AAS-Noncontemplators were .15 times more likely to not plan on participating in weightlifting competitions in the future than the AAS-Contemplators. Conversely, the AAS-Contemplators were (1/.15) or 6.67 times more likely to plan on participating in weightlifting competitions in the future than the AAS-Noncontemplators.

AAS-use and weightlifting competition. Because past research has found a significant link between AAS-use and individuals' competitive weightlifting desires (e.g., Brower et. al, 1991a; Chng & Moore, 1990), namely that competitive bodybuilders were significantly more likely to use AAS than noncompetitive bodybuilders, competitive weightlifters were compared to noncompetitive weightlifters on past and future AAS-use. On the first nonparametric test, a 2 compbefore (yes, no response) by 2 usebefore (yes, no response) chi square analysis was followed by a risk analysis in order to ascertain if and to what extent the weightlifting competition groups differed on

their past AAS-use. The results of this analysis revealed a significant chi square, X^2 (1) = 15.17, $p < .001$, indicating that past competitive and noncompetitive weightlifters differed significantly in their AAS-use history (see Table 62 for observed and expected values).

Table 62

Observed and Expected Values for Compete Before Groups on Use Before

	Used AAS Before			
	Yes		No	
Competed Before	Observed	Expected	Observed	Expected
Yes	15	6.9	22	33.1
No	16	24.1	114	105.9

In order to ascertain the magnitude of this difference in AAS-use between the groups with and without a past competitive weightlifting history, a risk analysis was conducted. Results of this analysis revealed that the odds ratio (response ratio) of the competitive weightlifters to the noncompetitive weightlifters was 4.86 to 1 indicating that the weighlifters who had competed in the past were 4.86 times more likely to have used AAS before than the weightlifters who had not competed in the past.

On the second nonparametric test, a 2 compbefore (yes, no response) by 2 usefuture (yes, no response) chi square analysis was followed by a risk analysis in order to ascertain if and to what extent the weightlifting competition groups differed on their desire to use AAS in the future. The results of this analysis revealed a significant chi square, X^2 (1) = 9.32, $p < .001$, indicating

past competitive and noncompetitive weightlifters differed significantly in their desire to use AAS in the future (see Table 63 for observed and expected

Table 63

Observed and Expected Values for Compete-Before Groups on Use Future

	Use Future			
	Yes		No	
Competed Before	Observed	Expected	Observed	Expected
Yes	11	6.8	4	8.2
No	3	7.2	13	8.8

values). In order to ascertain the magnitude of this difference in the desire to use AAS in the future between the past competitive and noncompetitive weightlifters, a risk analysis was conducted. Results of this analysis revealed that the odds ratio (response ratio) of the past competitive weightlifters to the noncompetitive weightlifters was 11.92 to 1 indicating that the past competitive weighlifters were 11.92 times more likely to plan on using AAS in the future than the noncompetitive weightlifters.

On the third nonparametric test, a 2 compfuture (yes, no response) by 2 usebefore (yes, no response) chi square analysis was followed by a risk analysis in order to ascertain if and to what extent weightlifters who planned on competing in a future weightlifting event differed in their AAS-use history from those weightlifters who did not plan on competing in the future. The results of this analysis revealed a significant chi square, X^2 (1) = 18.50, $p < .001$, indicating that future competitive and noncompetitive weightlifters differed significantly in their AAS-use history (see Table 64 for observed and expected

Table 64

Observed and Expected Values for Compete-Future Groups on Use Before

	Used AAS Before			
	Yes		No	
Compete in Future	Observed	Expected	Observed	Expected
Yes	19	9.2	30	39.8
No	12	21.8	105	95.2

values). In order to ascertain the magnitude of this difference AAS-use history between the future competitive and noncompetitive weightlifters, a risk analysis was conducted. Results of this analysis revealed that the odds ratio (response ratio) of the future competitive weightlifters to the noncompetitive weightlifters was 5.54 to 1 indicating that the future competitive weighlifters were 5.54 times more likely to have used AAS in the past than the future noncompetitive weightlifters.

On the final nonparametric test, a 2 compfuture (yes, no response) by 2 usefuture (yes, no response) chi square analysis was followed by a risk analysis in order to ascertain if and to what extent weightlifters who planned on competing in a future weightlifting event differed in their intention to use AAS in the future from those weightlifters who did not plan on competing in the future. The results of this analysis revealed a significant chi square, X^2 (1) = 6.42, $p <$ .05, indicating that future competitive and noncompetitive weightlifters differed significantly in their intention to use AAS in the future (see Table 65 for observed and expected values). In order to ascertain the magnitude of this difference in AAS-intention between the future competitive and noncompetitive

Table 65

Observed and Expected Values for Compete-Future Groups on Use Future

	Use Future			
	Yes		No	
Compete in Future	Observed	Expected	Observed	Expected
Yes	12	8.6	7	10.4
No	2	5.4	10	6.6

weightlifters, a risk analysis was conducted. Results of this analysis revealed that the odds ratio (response ratio) of the future competitive weightlifters to the noncompetitive weightlifters was 8.57 to 1 indicating that the future competitive weighlifters were 8.57 times more likely to plan on using AAS in the future than the future noncompetitive weightlifters.

Steroid Variable Questionnaire (SVQ)

Hypothesis #12: AAS-Users Will Possess the Most Positive Attitudes Towards AAS Compared to the Other Groups

Hypothesis #13: AAS-Contemplators Will Express the Most Pressure to Put on Muscle Mass and Possess the Greatest Belief That the Context of the Gym in Which They Train Pushes Them to Put on Muscle Mass Compared to the Other Groups

Attitude towards AAS, peer pressure, and gym context. Because AAS has been shown to possess potent ergogenic and restorative effects, it is believed that the AAS-Users will possess the most positive attitudes towards AAS than the other groups. However, the AAS-Contemplators, who are so driven to put on muscle mass, are believed to express the most pressure to put on muscle

mass and possess the greatest belief that the context of the gym in which they train pushes them to put on muscle mass than the other weightlifting groups.

A Pearson Product Correlation Coefficient Matrix was constructed using the variables associated with the SVQ (see Table 66). Because past research

Table 66

Pearson Product Correlation Coefficients for Variables Associated with the Steroid Variable Questionnaire

	Context	Liftdiss	Peer	AAS-Find	AAS-Attitude	AAS-Intention	Approve	Listen
Context		-.16*	.45**	-.10	.01	.11	.03	-.15
Liftdiss		1.00	-.09	-.06	-.06	-.13*	-.16*	-.02
Peer			1.00	.09	.16*	.28**	.13*	-.08
AAS-Find				1.00	.16*	.32**	.15*	.18**
AAS-Attitude					1.00	.76**	.49**	.13*
AAS-Intention						1.00	.48**	.17**
Approve							1.00	.07

Note. Context = Social context of the gym; Liftdiss = weightlifting dissatisfaction; Peer = peer pressure to consume AAS; AAS-Find = belief that one can find AAS; AAS-Attitude = attitude towards AAS; AAS-Intention = intention to use AAS in the future; Approve = Family and friends' perceived approval of participants' decision to use AAS; Listen = Participants' decision to listen to others concerning future AAS-use.

* $p < .05$. ** $p < .001$.

in drug use has linked participants' attitudes towards their drug with their peers' attitudes, the signficantly correlated variables of AAS-Attitude, Context, and

Peer were placed into a discriminant analysis. Inspection of the means, presented in Table 67, revealed that the AAS-User group displayed the most

Table 67

Group Centroids, Means, and Standard Deviations for AAS-Attitude, Peer, and Context

		Group Means and Standard Deviations					
		AAS-Attitude		Peer		Context	
Groups	Group Centroids	M	S.D.	M	S.D.	M	S.D.
	-.50	1.87	.72	2.49	.70	3.28	.63
AAS-Contem.	1.11	3.15	.72	2.82	.77	3.45	.68
AAS-User	1.50	3.40	1.09	2.77	1.01	3.13	.72

Note. Contem. = contemplator.

positive attitudes on AAS, followed by the AAS-Contemplators, and then the AAS-Noncontemplators. The AAS-Contemplators revealed the greatest peer pressure to put on muscle mass and believed their gym to possess the most intense training atmosphere which motivated them to put on muscle mass. The AAS-Users revealed lower levels on these two variables.

Results of this discriminant analysis revealed one significant function, $X^2(9) = 83.81$, $p < .001$, in which attitude towards AAS proved to be the best discriminator of the weightlifting groups (see Table 68). This strong variable proved to be the main reason why the group centroids reflected that the AAS-Noncontemplators were signficantly discriminated from the other weightlifting groups (see Table 67). This result partially supported all three hypotheses.

This function explained 42% of the total variance (Wilks' Lambda = .58) and correctly classified 81.53% of group membership.

Table 68

Standardized Canonical Discriminant Function Coefficients for AAS-Attitude, Peer, and Context

	Function 1
Context	-.20
Peer	.25
AAS-Attitude	.97

Hypothesis #14: AAS-Contemplators Will Be Less Likely to Listen to Others' Opinions Concerning Whether They Should Use AAS Compared to the Other Groups

Hypothesis #15: AAS-Users Will Express the Greatest Amount of Support From Others Concerning AAS-Use Compared to the Other Groups

Hypothesis #16: AAS-Users Will Be Able to Find AAS Easier Than Any of the Other Weightlifting Groups

Listen, approve, and AAS-find. In order to investigate the effects of others upon individuals' decision to use AAS and ability to find AAS, the significantly intercorrelated variables of approval to use AAS (Approve), participants' willingness to listen to others' opinions about AAS-use (Listen), and ability to find AAS (AAS-Find) were used to discriminate the weightlifting groups.

Because AAS-Users have already established connections to obtain AAS, it is believed that they will possess the greatest AAS-Find scores among the

weightlifting groups. In addition, in order to rectify using AAS, it is surmised that AAS-Users express the most perceived approval from others to use AAS among the weightlifting groups. However, due to their excessively strong desire to gain muscle mass, it is believed that the AAS-Contemplators will be the least likely of the weightlifting groups to listen to others' opinions concerning whether they should use AAS.

Inspection of the means, presented in Table 69, revealed that the AAS-

Table 69

Group Centroids, Means, and Standard Deviations for Listen, AAS-Find, and Approve

		Group Means and Standard Deviations					
		Listen		AAS-Find		Approve	
Groups	Group Centroids	M	SD	M	SD	M	SD
AAS-Noncontem.	-.29	2.78	.49	3.29	1.19	1.77	.57
AAS-Contem.	.98	3.02	.32	3.82	1.20	2.41	.51
AAS-User	.63	2.91	.68	4.09	.79	2.22	.64

Note. Contem. = contemplator.

Contemplators, followed by the AAS-Users revealed the least willingness to listen to others' opinions of AAS-use and perceived the most support from significant others' concerning AAS-use. Also, the AAS-Users, followed by the AAS-Contemplators, believed themselves to possess the greatest ability to find AAS.

Results of this discriminant analysis revealed one significant function, X^2 (6)= 34.75, $p<.001$, in which Approve proved to be the best group discriminator of these variables (see Table 70). This function explained 20% of the total

Table 70

Standardized Canonical Discriminant Function Coefficients for Listen, AAS-Find, and Approve

	Function 1
Listen	.15
AAS-Find	.49
Approve	.78

variance (Wilks' Lambda = .80) and correctly classified 72.67% of group membership. The group centroids (see Table 69) revealed the AAS-Noncontemplators were significantly differentiated from the AAS-Contemplators and AAS-Users based on these 3 variables, thereby partially supporting the hypotheses. The AAS-Contemplators did reveal the highest score on Listen, however they were not signficantly differentiated from the AAS-User group. Similarly, the AAS-User group did reveal the highest AAS-Find scores and a high Approve score, yet they were not significantly differentiated from the AAS-Contemplator group.

Hypothesis #17: AAS-Contemplators Will Express the Greatest Dissatisfaction With Their Weightlifting Than Any of the Other Groups

Weightlifting dissatisfaction. Individuals who possess the greatest desire to put on muscle mass would become the most dissatisfied if anything blocks this goal - such as a lack of progress in the weight room. For this reason, it was

believed that the AAS-Contemplators would express the greatest dissatisfaction with their weightlifting than the other weightlifting groups.

Because it is presumed that one's dissatisfaction with weightlifting will influence one's attitude towards AAS and steer one either towards or away from AAS, the significantly intercorrelated variables of AAS-Attitude, AAS-Find, and Liftdiss were placed into a discriminant analysis. Although the control group was not included in this discriminant analysis, as the Liftdiss variable was not relevant to them, their means and standard deviations for AAS-Attitude and AAS-Find were presented with the other groups as a means of comparison. Inspection of the means (see Table 71) revealed that the AAS-

Table 71

Group Centroids, Means, and Standard Deviations for AAS-Attitude, AAS-Find, and Weightlifting Dissatisfaction

		Group Means and Standard Deviations					
		AAS-Attitude		AAS-Find		Liftdiss	
Groups	Group Centroids	M	SD	M	SD	M	SD
Control	N/A	1.90	.78			N/A	
AAS-Noncontem.	-.52	1.87	.72	3.29	1.19	3.46	.69
AAS-Contem.	1.16	3.18	.70	3.82	1.20	3.31	.97
AAS-User	1.49	3.40	1.07	4.09	.79	3.39	.70

Note. Contem. = contemplator.

Noncontemplators possessed the greatest weightlifting dissatisfaction among the weightlifting groups, followed by the AAS-Users. The AAS-Attitude and

AAS-Find variables, having been discussed in previous discriminant analyses, will not be further discussed here.

Results of the discriminant function revealed one significant function, X^2 (6) = 87.02 , $p<.001$, in which the AAS-Attitude variable proved to be the strongest discriminator of the groups (see Table 72). This function explained

Table 72

Standardized Canonical Discriminant Function Coefficients for AAS-Attitude, AAS-Find, and Liftdiss

	Function 1
AAS-Attitude	.95
AAS-Find	.25
Liftdiss	-.05

43% of the total variance (Wilks' Lambda = .57) and correctly classified 80% of group membership. Group centroids (see Table 71) revealed that the AAS-Users and AAS-Contemplators were, once again, significantly differentiated from the AAS-Noncontemplators. This was mainly due to group differences concerning attitudes towards AAS and beliefs about participants' ability to find AAS. Thus, the hypothesis that the AAS-Contemplators would possess the greatest weightlifting dissatisfaction was not supported.

Predictors of Intention to Use Steroids and Attitudes Towards Steroids

Intention to use steroids (AASIntention). As a corollary topic of interest, the best predictors of AASIntention were examined via a Stepwise Multiple Regression analysis. The variables which predicted the greatest amount of AASIntention's variance were AAS-Attitude, Peer, AAS-Find, and Strength, F (4,

97) =68.21, F<.001, (see Table 73). Amount of variance explained per individual variable is presented in Table 74.

Table 73

Multiple Regression Results for AAS-Attitude, Peer, AAS-Find, and Strength as Predictors of The Intention to Use AAS

Multiple R	.86
R Square	.74
Adjusted R Square	.73
Standard Error	.59

Table 74

Stepwise Multiple Regression Results for AAS-Attitude, Peer, AAS-Find, and Strength In Predicting AAS-Intention

Step	Variable	Multiple R	R Square	F (Egn)	Sig F
1	AAS-Attitude	.78	.61	158.97	.00
2	Peer	.82	.67	100.97	.00
3	AAS-Find	.84	.71	80.92	.00
4	Strength	.86	.74	68.22	.00

As seen in this Stepwise Multiple Regression, the main predictor of one's intention to use AAS was one's attitude towards steroid use. This variable alone accounted for over 60% of AAS-Intention's variance. Peer pressure to use AAS, ability to find AAS, and an individual's overall strength level still

proved to be significant predictors of AAS-Intention, with each accounting for an additional 3-6% of the variance.

Attitude towards steroids (AAS-Attitude). In order to ascertain the best predictors of AAS-Attitude, a Stepwise Multiple Regression analysis was performed. The variables which predicted the greatest amount of AAS-Attitude's variance were AAS-Intention, Height, Approve, Use Before, and Job Competence, F (5, 151) = 59.31, p<.001, (see Table 75). The amount of variance explained per individual variable is presented in Table 76.

Table 75

Multiple Regression Results for AAS-Intention, Height, Approve, Use Before, and Job Competence as Predictors of AAS-Attitude

Multiple R	.81
R Square	.66
Adjusted R Square	.65
Standard Error	.61

As seen in this Stepwise Multiple Regression, the main predictor of attitude towards AAS was one's intention to use AAS in the future. As can be seen in Table 76, AAS-Intention was the main predictor of AAS-Attitude as it accounted for 60% of AAS-Attitude's variance. This is not altogether suprising, given that AAS-Attitude and AASIntention are very highly correlated (r=.77) and that AAS-Attitude accounted for roughly 60% of AASIntention's variance (see Table 74). Job Comptence, Height, Use Before, and Approve each significantly accounted for an additional 1-2% of AAS-Attitude's variance.

Table 76

Stepwise Multiple Regression Results for AAS-Intention, Height, Approve, Use Before, and Job Competence In Predicting AAS-Attitude

Step	Variable	Multiple R	R Square	F (Egn)	Sig F
1	AAS-Intention	.77	.60	232.40	.00
2	Height	.79	.62	124.58	.00
3	Approve	.80	.64	89.55	.00
4	Use Before	.81	.65	71.17	.00
5	Job Competence	.81	.66	59.31	.00

Exploratory Analyses

Several attempts were made to gain a better understanding of the data by pulling apart, collapsing, and redefining groups based on several significantly discriminating variables. Not only would such analyses provide an alternate and more informative view of the data, but in some instances, by collapsing groups and thereby raising the number of participants per group, the statistical power of the discriminant analyses was elevated. However, when teasing groups apart, many different problems arose, such as obtaining a minimum number of participants in a particular group. The problems particular to each exploratory attempt to examine the data will be discussed per individual category below.

Teasing apart the AAS-User group. In this study, those individuals who had used AAS before comprised the AAS-User group. Because this definition does not reflect AAS-Users' intention to use AAS in the future, the AAS-User

group was divided into 2 groups: Those who planned on using AAS in the future (AAS-Future) and those who did not plan on using AAS in the future (AAS-Nofuture). Such a dichotomization of the AAS-User group can provide additional information to AAS-interventionists and preventionists concerning why AAS-Users decide to cease using these drugs. As such, discriminant analyses were conducted on these AAS-User subgroups using the psychosocial, situational, and weightlifting-related variables of this study.

For the most part, analyzing the data with the new AAS-User subgroups proved to be difficult. Issues of power arose as the AAS-Future group contained 18 participants and the AAS-Nofuture group contained 13 participants. This limited all discriminant analyses to 2 independent variables. Another problem that arose was that this new group categorization did not differ greatly, except for one instance, from the original group categorization. That is, these newly created AAS-User subgroups did not differ significantly from one another in most of the analyses, making the exploratory analyses analagous to the original analyses. For example, in most of the exploratory analyses, the control group and the AAS-Noncontemplator group were signficantly differentiated from the AAS-Contemplators, AAS-Future, and AAS-Nofuture groups just like in the original analyses. However, although most of the mean scores of these AAS-User subgroups did not differ significantly enough to statistically separate these groups, they did show interesting and important trends. Several discriminant analysis investigating these new groups did reveal results differing from the original analyses and are presented below.

Athletic and cognitive competence. Of corrollary interest to this study were the potential differences between the AAS-Future and AAS-Nofuture groups on

Harter's (1986) perceived competence subscales. In the first significant discriminant analysis, groups were compared on the significantly correlated athletic and cognitive competence analysis. Means for these variables, presented in Table 77, indicated that the control group of non-exercisers and the AAS-Nofuture group possessed more favorable perceptions of their athletic competence than the other groups. Also, the control group revealed higher cognitive competence than the other groups.

Table 77

Group Centroids, Means, and Standard Deviations for Athletic and Cognitive Competence

		Group Means and Standard Deviations			
		Athletic		Cognitive	
Groups	Group Centroids	M	SD	M	SD
Control	.67	2.43	.34	2.41	.28
AAS-Contem.	-.01	2.39	.32	2.20	.30
AAS-Noncontem.	-.15	2.36	.29	2.15	.32
AAS-Future	.04	2.38	.34	2.21	.26
AAS-Nofuture	-.27	2.45	.28	2.12	.30

Note. Contem. = contemplator.

Results of this discriminant analysis revealed one significant function, X^2 (8)= 17.46, $p<.05$, in which cognitive competence proved to be the best discriminator of the groups (see Table 78). This strong subscale proved to be the main reason behind the group centroids trend (see Table 77) which differentiated the AAS-User subgroups. That is, the control and AAS-Future

Table 78

Standardized Canonical Discriminant Function Coefficients for Athletic and Cognitive Competence

	Function 1
Athletic	-.08
Cognitive	1.02

groups possessed significantly higher cognitive competence than the other groups when taking athletic competence into account. This discriminant analysis explained 9% of the total variance (Wilks' Lambda = .91), and correctly classified 59.89% of group membership.

Social and cognitive competence. In the other significant discriminant variable using Harter's (1986) perceived competence subscales, groups were compared on the significantly correlated social and cognitive competence subscales. Cognitive competence, used in the first discriminant analysis, was used again in this discriminant analysis because it possessed the highest correlation with social competence than the other perceived competence measures. Means for these variables, presented in Table 79, showed the AAS-Noncontemplators to possess the greatest social competence scores.

Results of this discriminant analysis revealed one significant function, X^2 (8)= 18.93, $p<.05$, in which cognitive competence proved to be the best discriminator of the groups (see Table 80). This strong variable proved to be the main reason behind the group centroids trend (see Table 79) which differentiates the AAS-User subgroups. That is, the control and AAS-Future groups possessed significantly higher cognitive competence and lower social

Table 79

Group Centroids, Means, and Standard Deviations for Social and Cognitive Competence

		Group Means and Standard Deviations			
		Social		Cognitive	
Groups	Group Centroids	M	SD	M	SD
Control	.70	2.37	.32	2.41	.28
AAS-Contem.	-.04	2.44	.29	2.20	.30
AAS-Noncontem.	-.16	2.42	.28	2.15	.32
AAS-Future	.01	2.33	.49	2.21	.26
AAS-UserNofutur	-.21	2.37	.21	2.12	.30

Note. Contem. = contemplator.

Table 80

Standardized Canonical Discriminant Function Coefficients for Social and Cognitive Competence

	Function 1
Social	-.34
Cognitive	1.01

competence than the other groups. This discriminant analysis explained 10%of the total variance (Wilks' Lambda = .90), and correctly classified 60.96% of group membership.

Context and peer. It was of corrollary interest to investigate potential differences among the AAS-User subgroups in terms of their perception of the context of the gym in which they trained and the peer pressure to gain muscle mass. Inspection of the means (see Table 81) revealed that the AAS-Nofuture

Table 81

Group Centroids, Means, and Standard Deviations for Context and Peer

		Group Means and Standard Deviations			
		Context		Peer	
Groups	Group Centroids	M	SD	M	SD
AAS-Contem.	.25	3.45	.68	2.82	.77
AAS-Future	.86	3.25	.87	3.14	1.05
AAS-Noncontem.	-.14	3.27	.64	2.47	.71
AAS-Nofuture	-.23	3.10	.55	2.33	.81

Note. Contem. = contemplator.

group possessed the lowest mean scores for both Context and Peer variables. In addition, the AAS-Contemplators revealed the greatest Context mean scores and the AAS-Future group possessed the greatest Peer scores.

Results of this discriminant analysis revealed one significant function, X^2 (6)= 17.70, $p<.01$, where Peer proved to be the best discriminator of the weightlifting groups (see Table 82). This function explained 11% of the totalvariance (Wilks' Lambda = .89) and correctly classified 74.38% of group membership. The group centroids, presented in Table 81, revealed that the AAS-Noncontemplators and the AAS-Nofuture groups were signficantly differentiated from the AAS-Contemplators and AAS-Future groups.

Table 82

Standardized Canonical Discriminant Function Coefficients for Context and Peer

	Function 1
Contex	-.47
Peer	1.13

Combining the AAS-User and AAS-Contemplator Groups

Because the AAS-User and AAS-Contemplator groups were rarely differentiated by the discriminant analyses, they were combined into one group. By combining these small groups, thereby raising statistical power, more independent variables could be used in one discriminant analysis. Instead of rerunning all of the data using these new groups, it was decided that the best discriminators of the original analyses would be placed into one discriminant analysis in order to directly compare these variables. However, because the control group was excluded from some of these strong predictors (such as the weightlifting variables) in some cases or did not contain enough participants who possessed complete sets of data in other cases, only one worthwhile discriminant analysis could be performed using the control group and the weightlifting groups.

Control group, AAS-Noncontemplators, AAS-Use/Contemplator group. A discriminant function was conducted using the AAS-Attitude, Weight, Gainwgt, and AAS-Find. Inspection of the means, presented in Table 83, revealed that the AAS-Contemplator/User group, followed by the AAS-Noncontemplators,

possessed the most favorable attitudes towards AAS, the greatest weight, the greatest desire to gain weight, and the greatest ability to find AAS.

Table 83

Group Centroids, Means, and Standard Deviations for AAS-Attitude, Weight, Gain Weight, and AAS-Find

		Group Means and Standard Deviations							
		AAS-Attitude		Weight		Gain Weight		AAS-Find	
Groups	Group Centroids	M	SD	M	SD	M	SD	M	SD
Control	-.81	1.91	.79	174.92	26.53	1.83	.73	3.00	1.01
AAS-Noncontem.	-.38	1.86	.74	190.11	26.39	2.55	.94	3.29	1.20
AAS-Contem/User	1.54	3.25	.94	202.20	29.95	3.26	.95	3.96	.95

Note. Contem. = contemplator.

Results of the discriminant analysis revealed one significant function, X^2 (8)= 113.25, $p<.001$, in which AAS-Attitude possessed the highest canonical discriminant function coefficient of these variables, proving itself to be the best discriminator of the groups (see Table 84). As such, the strong discriminative ability of AAS-Attitude was the main reason behind the group centroid trends (see Table 83), which revealed the AAS-Contemplator/User group to be significantly differentiated from the control and AAS-Noncontemplator groups. This significant function explained 48% of the total variance (Wilks' lambda = .52) and correctly classified 71.67% of group membership.

Table 84

Standardized Canonical Discriminant Function Coefficients for AAS-Attitude, Weight, Gain Weight, and AAS-Find

	Function 1
AAS-Attitude	.78
Weight	.20
Gain Weight	.37
AAS-Find	.30

AAS-Noncontemplator and AAS-Contemplator/User groups. Because the smaller of the weightlifting groups contained at least 46 participants, which affords greater flexibility in terms of the number of indepedendent variables which can be used in a discriminant analysis, a stepwise discriminant analysis was performed in order to pit the strongest discriminators of the groups against each other. In such an analysis, variables are placed into a discriminant function equation based on their discriminative power so that the strongest discriminators are analyzed before the weaker discriminators. Thus, this discriminant analysis was performed using the following variables: AAS-Attitude, Gain Weigt, AAS-Find, Strength, Peer, and Context.

Results of this stepwise discriminant analysis revealed a signficant function, X^2 (3) = 64.73, $p < .001$, in which AAS-Attitude, Strength, and Gain Weight proved to be the best discriminators of the 2 weightlifting groups. The means and standard deviations are presented in Table 85 and the summary table of this stepwise analysis is presented in Table 86. This significant function

explained 50% of the total variance (Wilks' lambda = .50) and correctly classified 83.17% of group membership.

Table 85

Group Means and Standard Deviations for AAS-Attitude, Strength, and Gain Weight

	Group Means and Standard Deviations					
	AAS-Attitude		Strength		Gain Weight	
Groups	M	SD	M	SD	M	SD
AAS-Noncontem.	1.90	.72	1136.17	358.24	2.61	.96
AAS-Contem/User	3.38	.99	1561.38	465.51	3.55	.88

Note. Contem. = contemplator.

Table 86

Summary Table for Stepwise Discriminant Function for AAS-Attitude, Strength, and Gain Weight

Step	Variable	Wilks' lambda	Sig F
1	AAS-Attitude	.58	.00
2	Strength	.52	.00
3	Gain Weight	.50	.00

To summarize the results of the discriminant analyses performed in this study, two summary tables are presented. Table 87 and Table 88 show the results of this study's hypotheses and corollary questions, respectively.

Table 87

Summary of the Discriminant Analyses Results Found for the Proposed Hypotheses

Hypothesis	Result
AAS-Contemplators will have lower perceived competence in the normative life domains of cognitive, athletic, job, physique, and social competence than any of the other groups.	a
AAS-contemplators will have lower global self-worth than any of the other groups.	NS
The AAS-User group will be significantly heavier than the other groups.	Sig
The AAS-User group will possess a significantly larger body size than the other groups.	b
The AAS-Contemplator group will desire a greater body size differential (goal body size - actual body size) than any of the other groups.	b
AAS-Contemplators will have the greatest body image disturbances of any of the other groups.	b
AAS-Users will be stronger than the other weightlifting groups.	b
AAS-Contemplators will train the longest over the week than the other weightlifting groups.	b
There will be no differences among the groups in terms of how many years they have been weightlifting.	NS
The AAS-Noncontemplators will have been heavier than the other weighlifting groups before they started weightlifting.	c
AAS-Users will possess the most positive attitudes towards AAS.	b
AAS-Contemplators will express the most pressure to put on muscle mass and possess the greatest belief that the context of the gym in which they train pushes them to put on muscle mass.	b
AAS-Contemplators will be less likely to listen to others' opinions concering whether they should use AAS.	b
AAS-Users will express the greatest amount of support from others concerning AAS-use.	b
AAS-Users will be able to find AAS easier than any of the other weightlifting groups.	b
AAS-Contemplators will express the greatest dissatisfaction with their weightlifting than any of the other groups.	NS

Table 87 (cont'd)

Note. NS = nonsignificant. Sig = significant. a = partial support for the hypothesis in which the AAS-Contemplators possessed significantly lower mean scores than the control group only. b = partial support for the hypothesis in which the AAS-Contemplators and AAS-Users possessed significantly different mean scores in the predicted direction from the AAS-Noncontemplators and/or the Control group. c = the mean score was in the predicted direction, but because of the shared variance between the desired variable and the other variables included in the same discriminant analysis, the results did not support the hypothesis.

Table 88

Summary of the Discriminant Analyses Results Found for the Corollary Questions

Corollary Question	Result
The AAS-User will be significantly heavier than the other groups	Sig
The AAS-Users and AAS-Contemplators will be younger than the other groups	NS
The AAS-Users and the AAS-Contemplators will be shorter than the other groups	NS

Note. Sig = significant. NS = nonsignificant.

Path Analyses

Psychosocial and Situational Variables Impacting AAS-Intention.

Structural equation modeling (SEM) was used to test the causal processes linking psychosocial and situational indicators to one's intention to use AAS. The general procedures used in determing the best fit of the predicted path model to the actual mathematical path model will be explained before the models themselves are presented. When a hypothetical path model's

predictive power is tested, almost certainly, some predicted paths are shown to be nonsignificant. Because these paths represent additional parameters and use up degrees of freedom resulting in a weaker model, they are normally thrown out of the model (trimmed) and the model retested. As a result of trimming these nonsignificant paths, path coefficients for the significant paths may change when the model is retested; sometimes becoming stronger and sometimes weaker. Once again, nonsignificant paths are trimmed and the model retested until no nonsigificant paths remain and the modification indicies indicate that no new significant paths have emerged in the trimming process.

In this study, the original path model was so laden with variables and paths that the model's parameters outnumbered the total sample size, resulting in unreliable parameter estimates. Even as nonsignificant paths were trimmed, the number of parameters still outnumbered the total sample size. In order to reduce the number of parameters below the total sample size, the twenty-one predicted path correlations which equalled plus or minus 0.4 or less were trimmed from the model. Because these correlations were very weak, contributing little to the overall path model, they were fixed to 0.0 thereby freeing up degrees of freedom. In the end, the parameters were significantly reduced below the total sample size, creating reliable parameter estimates.

A second concern should also be addressed concerning the trimmed path model. When trimming a model of nonsignificant paths, these paths are no longer tested and thus, do not possess path coefficients. Therefore, only the significant paths and all of the correlations, except those fixed to 0.0 as explained above, are represented in the following tables and figures.

Table 89

Correlation Coefficients for the Proposed Full Model of the Psychosocial and Situational Variables Which Influence AAS-Intention

	Listen	Approve	Lift Diss	AAS-Attit.	AAS-Int.	Cognitive	Job	Athletic	Social	Physique
Listen	1.00									
Approve	.12	1.00								
Liftdiss	.03	-.02	1.00							
AAS-Attit.	.19*	.51*	-.04	1.00						
AAS-Int.	.25*	.49*	-.05	.78*	1.00					
Cognitive	-.03	.03	-.08	.05	.08	1.00				
Job	.00	-.04	.05	-.18*	-.09	a	1.00			
Athletic	.00	.01	-.05	.00	.03	.27*	.13	1.00		
Social	.00	.00	-.05	.02	.01	.22*	-.11	.24*	1.00	
Physique	.02	-.05	.11	-.10	-.12	-.12	.22*	.05	-.11	1.00
Global	.00	.02	-.03	.03	.04	.07	a	a	.08	-.18
Appear.	.09	.15	-.08	.22*	.33*	.11	-.10	.06	a	-.11
BASS	.19*	-.01	.23*	-.03	-.03	-.22*	.13	a	a	.24*
Gainwgt	.05	.08	-.22*	.12	.19*	.11	-.08	.20*	.19	-.26*
Underwgt	.04	-.02	.11	-.03	-.05	-.24*	a	-.13	-.26*	.27*
Selfmus	.03	-.02	.03	-.04	-.05	.09	.11	-.07	.10	-.19
Selfwgt	-.05	.06	-.12	.09	.13	.11	a	.08	a	-.21*
Context	.07	-.01	.15	-.02	-.03	-.31*	a	-.15	-.38*	.45*
Peer	.02	.14	-.10	.20*	.31*	.18*	-.12	.12	.08	-.29*
AAS-Find	.11	.14	.00	.18*	.31*	a	.07	a	-.05	a

Table 89 (cont'd)

	Global	Appearance	Gainwgt	Under Weight	BASS	Selfmus	Selfwgt	Context	Peer
Global	1.00								
Appev	a	1.00							
Gainwgt	.09	.43*	1.00						
Under weight	a	.11	-.22*	1.00					
BASS	a	.05	a	.27*	1.00				
Selfmus	.13	-.20*	.07	-.34*	.19*	1.00			
Selfwgt	.08	.21*	.12	-.25*	-.39*	.05	1.00		
Context	-.19*	.08	-.31*	.66*	.37*	-.31*	-.31*	1.00	
Peer	a	.16	.16	-.31*	-.30*	a	.46*	-.24*	1.00
AAS-Find	.13	.14	.13	a	.13	a	-.11	a	.10

* $p < .05$.

Note. a = those correlations between +/- 0.4 which were fixed to 0.0 to decrease the number of total parameters in the path model.

The hypothetical model tested in the present study (see Figure 1) is derived from Ajzen's (1991) Theory of Planned Behavior as well as the research on drug and AAS-use, body image, and social psychology, in general. Because there are many variables and paths involved, making the depiction of the modelvery cumbersome, the correlation for the full path model are presented in Table 89 on the previous page.

Because the full path model included many variables which possessed weak, nonsignificant relationships with the other variables, a trimmed path model was analyzed devoid of these weaker variables (see Figure 3).

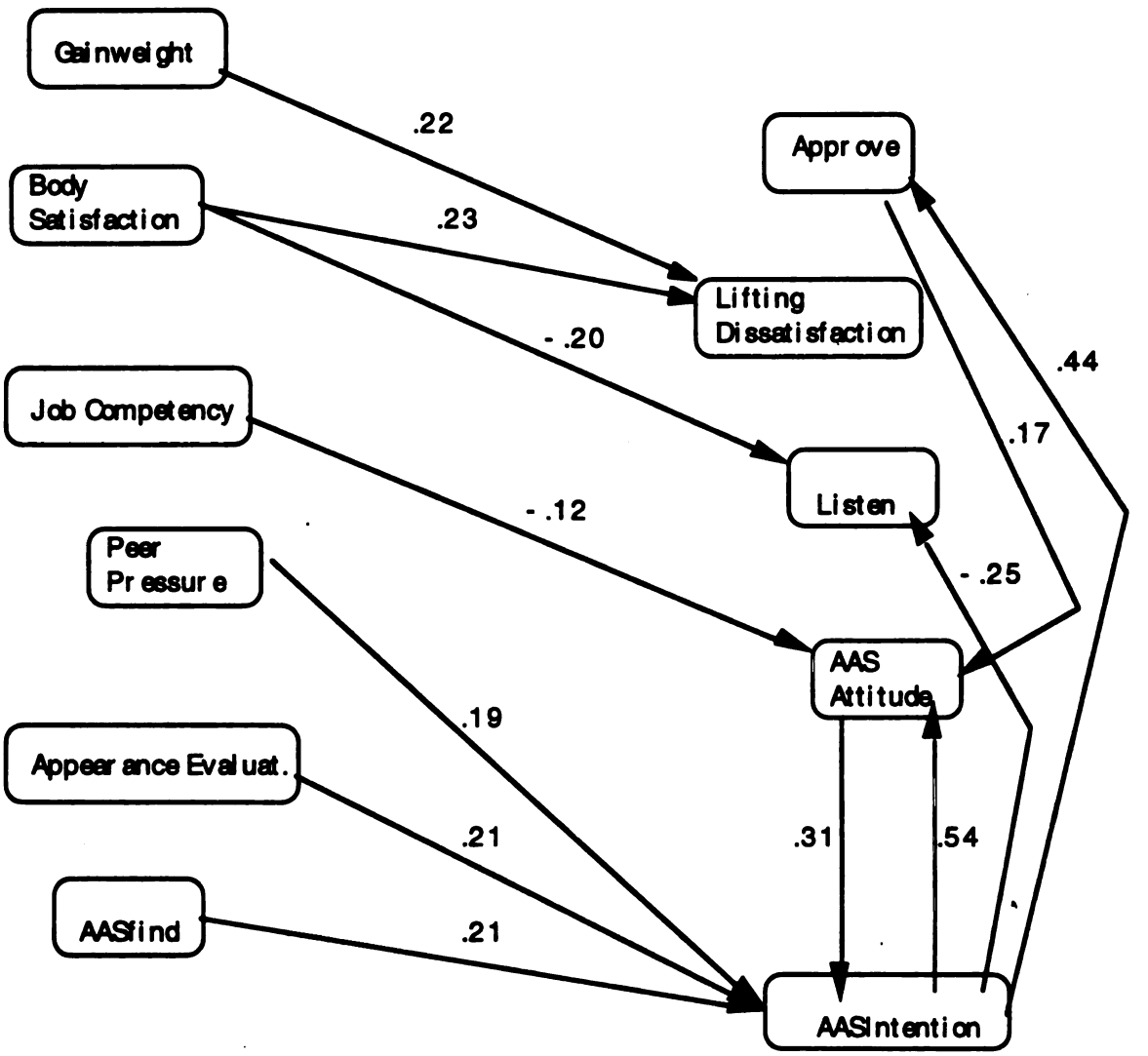

Figure 3. Trimmed path model of the psychosocial and situational variables which impact male weightlifters' intention to use AAS.

Results of Structural Equation Modeling (SEM) for the trimmed model revealed a goodness of fit index (GFI) of .95 with $X^2(95) = 72.26$, $p = .96$ and a root mean square error of approximation (RMSEA) = 0.0, indicating that the

predicted path model did not differ significantly from the actual, trimmed model. Because the trimmed path model contains many variables which are directly and indirectly related to the central issues of this study, namely one's attitudes about AAS (AAS-Attitude) and one's intention to use AAS (AAS-Intention), the variables which are further removed from these relationships will be discussed first, followed by the variables which are more closely related to AAS-Attitude and AAS-Intention.

As seen from the model, both the desire to gain weight (Gainweight) (gamma = .22) and body satisfaction (BASS) possessed a positively causal relationship (gamma = .23) with weightlifting dissatisfaction (Liftdiss). In other words, the greater these male weightlifters' desire to gain weight and the more satisfaction they felt towards their own bodies, the greater weightlifting dissatisfaction they experienced. These two variables, together, explained 10% of Weightlifting Dissatisfaction's variance (psi = .90).

The weightlifters' attitude towards AAS (AAS-Attitude) was causally influenced by several variables. With AAS-Attitude, job competence possessed a negative causal relationship (gamma = -.12), while the intention to use AAS (AAS-Intention) and the perceived support by significant others' to use AAS (Approve) possessed positive causal relationships, ß = .54 and ß = .17 respectively. That is, the less competent the participants' felt at their jobs, the more positive support they perceived from significant others concerning their AAS-use, and the greater their desire to use AAS, the more positive their attitude was towards AAS. These 3 variables, together, explained 62% of AAS-Attitude's variance (psi = .38).

The desire to use AAS influenced and was influenced by several variables. Those variables positively influencing weightlifters' AAS-Intention included perceived peer pressure to gain muscle mass (Peer), gamma = .19, evaluation of their appearance (Appearance Evaluat.),gamma = .21, perceived ability to find AAS (AAS-Find), gamma = .21, and AAS-Attitude, ß = .31, (these variables, together, explained 55% of AAS-Intention; psi = .45). Those variables which were positively, causally influenced by weightlifters' intention to use AAS included the perceived support from significant others to use AAS, Approve, ß = .44 (AAS-Intention explained 24% of Approve's variance; psi = .76), and AAS-Attitude, ß = .54, while the desire to listen to others concerning AAS-use (Listen) was impacted negatively by AAS-Intention, ß = -.25, (AAS-Intention explained 10% of Listen's variance; psi = .90),. In other words, the more peer pressure weightlifters' felt to put on muscle mass, the easier they thought they could find AAS, the more positively they evaluated their appearance, and the more positive their attitude was towards AAS, the greater were these individuals' intention to use AAS. In turn, the greater the weightlifters' intention to use AAS, the more positive were their attitudes towards AAS, the more likely they were to not listen to others concerning AAS-use, and the more likely they perceived positive support from significant others concerning their AAS-use. Interestingly, in this path analysis AAS-Attitude and AAS-Intention possessed reciprocal relationships, as hypothesized, in which the intention to use AAS positively influenced the attitude towards AAS and vice versa. However, AAS-Intention more strongly influenced AAS-Attitude (ß=.54) than vice versa (ß=.31).

The aforementioned model addressed the main goal of this study: To understand the psychosocial and situational variables which impact male weightlifters' intention to use AAS. However, despite the informativeness of this model, other important issues remain unaddressed. For example, the role of weightlifting variables, such as the desire to compete in future weightlifting events, on participants' AAS-Intention has not been examined despite past research finding a significant connection between these two variables (e.g., Chng & Moore, 1990). Another topic which needs to be addressed is whether first time use of AAS and repeated use of AAS are causally impacted by the same variables. These topics were subsequently dealt with in the following two path analyses.

Two weightlifting-related variables and two body-related variables which have either been shown to be significant in the multiple regressions or have been implicated by past AAS-research to be influential of AAS-use were added to the second path analysis along with all of the variables used in the initial path analysis. These new variables included height, body weight of participants' prior to initiating weightlifting (Preweigh), and whether participants' had competed in a bodybuilding, powerlifting, or Olympic Weightlifting in the past (Compbefore) or intended to compete in the future (Compfuture).

Results of SEM for this trimmed model revealed a goodness of fit index (GFI) of .94 with $X^2(116) = 108.20$, $p = .68$ and a root mean square error of approximation (RMSEA) = 0.0, indicating that the predicted path model did not differ significantly from the actual, trimmed model. While most of the variables and relationships of this path model were identical to the initial path model, the

several variables which became relevant or irrelevant and the new causal relationships formed in this new path model will be discussed.

Due to the addition of the height, desire to compete in future weightlifting events, competitive weightlifting history, and bodyweight prior to initiating weightlifting, the MBSRQ variables of gainweight, BASS, and appearance evaluation dropped out of this new path model while one new causal relationship was forged (see Figure 4). Weightlifting dissatisfaction revealed a positive causal relationship with AAS-Intention (ß = .18), indicating that the more dissatisfied participants became with their weightlifting, the greater were their intentions to use AAS. Of the 4 new variables added to the path analysis, only 2 revealed significant causal paths. Height possessed a negative causal path (gamma = -.17) with AAS-Attitude, revealing that the shorter participants were, the more favorably they viewed AAS. Height also helped account for significantly more of AAS-Attitude's variance, improving upon the 62% (psi = .38) found in the first path analysis to 64% (psi = .36) in this analysis. Intention to compete in future weightlifting events showed a positive causal path with AAS-Intention (gamma = .33), indicating that the greater participants' planned on competing in a bodybuilding, powerlifting, or Olympic Weightlifting competition in the future, the greater were their intentions to use AAS in the future. This finding is very significant given the fact that Compfuture is a dichotomous variable which possessed little variance as compared to the other continuous variables. Because path analyses rely heavily on variables' variance in determining paths coefficients, the fact that Compfuture was significant despite possessing little variance underscores its importance in impacting participants' intention to use AAS. The addition of Compfuture and

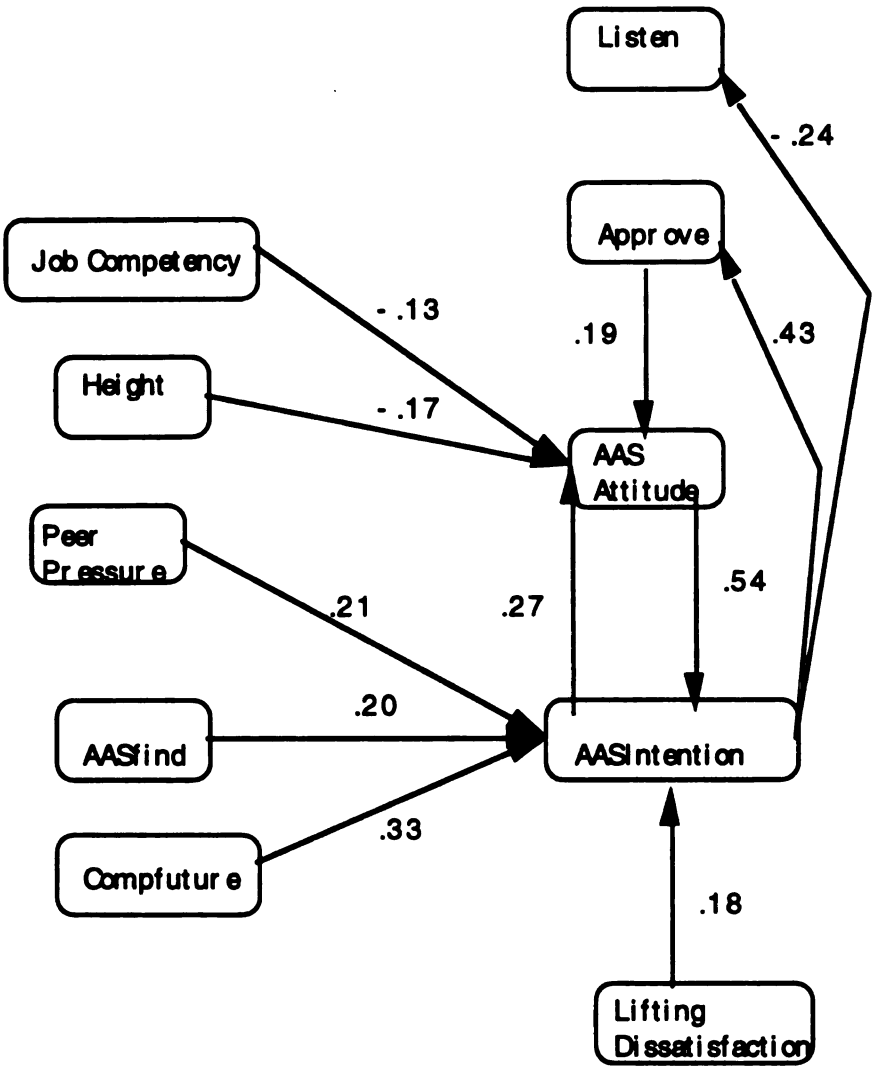

Figure 4. Trimmed path model of the psychosocial, situational, weightlifting-related, and personal descriptor variables which impact male weightlifters' intention to use AAS.

weightlifting dissatisfaction as significant impactors of AAS-Intention, in conjunction with the loss of Appearance Evaluation as an influencer of AAS-Intention in this analysis, helped account for more of AAS-Intention's variance;

improving upon the 55% (psi = .45) found in the first path analysis to 61% (psi = .39) in this new path analysis.

In addition to Height, Competitive History, Compfuture, and Pre-weightlifting bodyweight, Use Before (participants' past AAS-use) was also included in the second path analysis. Since social psychologists have found past behavior to be a significant predictor of future behavior, especially in general drug use (e.g., Bentler & Speckart, 1979), participants' past use of AAS (Use Before) was considered for addition to the model. However, because this variable was only relevant to and thus only answered by the 31 AAS-Users, it was too weak of a variable to include in the model (especially since some of the 31 AAS-Users supplied incomplete data sets thereby dropping them from the path analyses altogether). However, a one-tailed bivariate correlation was conducted between Use Before and AAS-Attitude and between Use Before and AAS-Intention. Both correlations revealed very highly signficant relationships, $r = -.50$ ($p < .001$) and $r = -.54$ ($p < .001$), respectively, indicating that the participants who have used AAS before held more positive attitudes towards AAS and were more likely to use these drugs in the future.

This second path analysis, like the first one, was based on all weightlifting participants: AAS-Noncontemplators, AAS-Contemplators, and AAS-Users. As a result, these path analyses findings do not discriminate between first time AAS-use and repeated AAS-use. While it would be most appropriate to examine repeated AAS-use by analyzing only AAS-Users in a path analysis, insufficient numbers of AAS-Users precluded this strategy. However, by comparing path models in which AAS-Users are either included or eliminated, first time AAS-Use and repeated AAS-Use can be indirectly investigated. By

eliminating AAS-Users in this new path analysis, a path model for first-time AAS-use was examined and is presented in Figure 5.

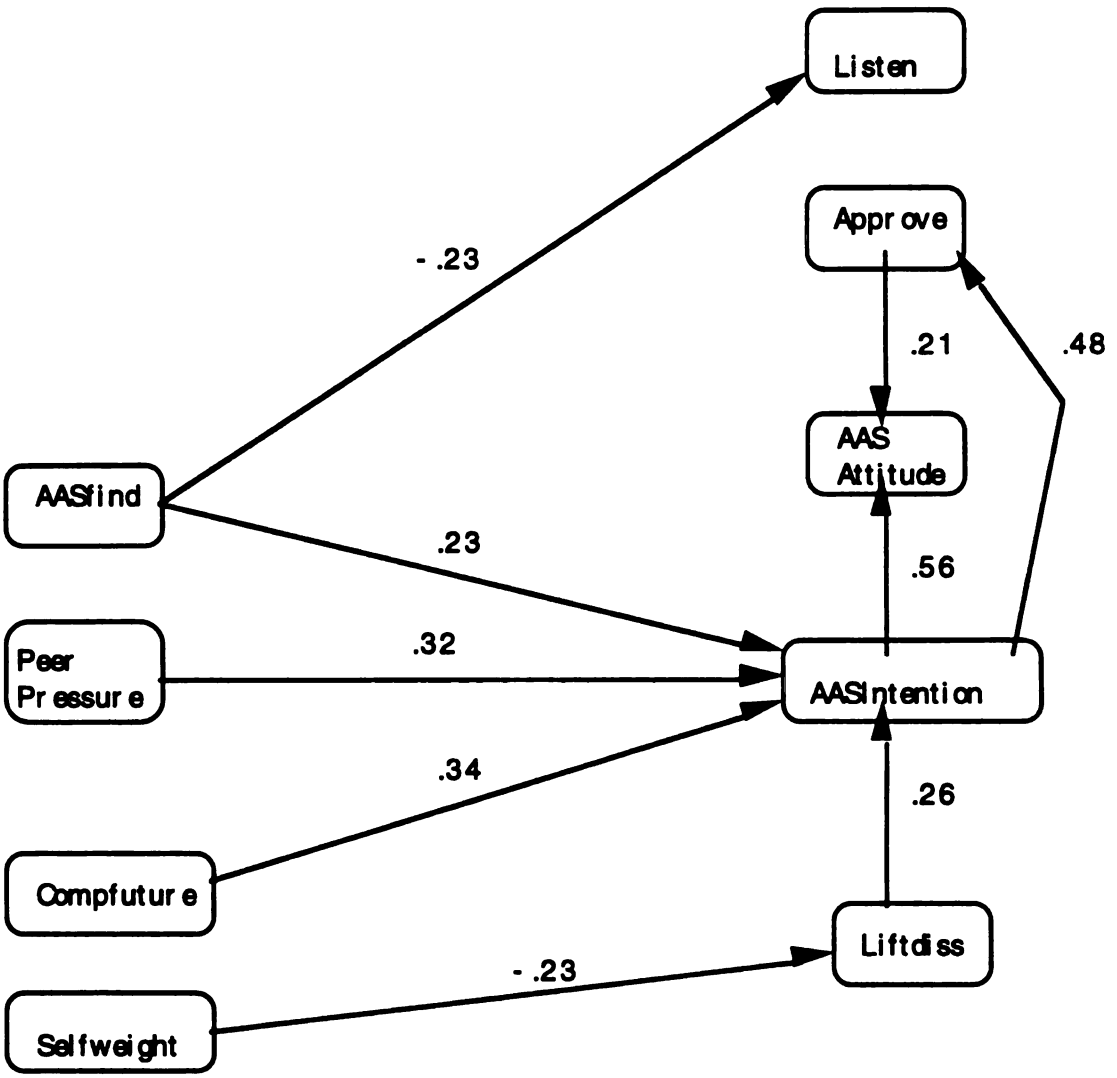

Figure 5. Trimmed path model of the psychosocial, situational, weightlifting-related, and personal descriptor variables which impact male weightlifters' intention to use AAS for the first time.

Results of SEM for this trimmed model revealed a goodness of fit index (GFI) of .93 with $X^2(118) = 107.33$, $p = .75$ and a root mean square error of

approximation (RMSEA) = 0.0, indicating that the predicted path model did not differ significantly from the actual, trimmed model. In comparing this new path model of first time AAS-use with the previous path model of repeated AAS-use, several changes became evident. The variables of job competence and height, which had predicted AAS-Attitude in the previous path model, dropped out of this path model, indicating that these variables may only become important influencers of repeated AAS-use. As a result, the percent of AAS-Attitude's variance accounted for was reduced from 64% (psi = .36) in the previous model to 47% (psi = .53) in this model. In addition to these changes, the positive causal paths from AAS-Attitude to AAS-Intention and from AAS-Intention to Listen, which were significant in the previous path model, became nonsignificant in this path model. That is, participants' attitudes towards AAS does not causally influence their intention to use AAS for the first time and, in turn, their intention to use AAS for the first time does not causally impact their decision to listen to significant others' opinions concerning AAS-use. As a result of the AAS-Attitude-AAS-Intention relationship dropping out of this model of first time AAS-use, the percent of AAS-Intention's variance was reduced from 61% (psi = .39) in the previous model to 34% (psi = .66) in this model.

In this new path model, two new relationships developed. Participants' perceived body weight (Selfweight) revealed a negative causal path with their weightlifting dissatisfaction (gamma = -.23), indicating that the more participants perceived themselves to be underweight, the more weightlifting dissatisfaction they experienced. In addition, AAS-Find possessed a negative causal path with Listen (gamma = -.23), revealing that the easier participants believed they

could find AAS, the less likely they were to listen to parents, friends, and relationship partners' opinions of AAS-use.

Interim Summary. The three path analyses revealed interesting findings concerning first time and repeated AAS-use. While psychosocial and situational variables did influence participants' attitudes towards AAS and ultimately their intention to use AAS, personal descriptors such as height and weighlifting seriousness (i.e., desire to compete in weightlifting competitions) and perhaps past AAS-use need to be considered further in future research in order to fully understand participants' intention to use AAS. When considering first time AAS-use, many factors influenced participants' AAS-Intention: Peer pressure to use AAS, ability to find AAS, intention to compete in a future weightlifting event, and weightlifting dissatisfaction. Intention to use AAS for the first time, in turn, causally influenced participants' decision to listen to significant others' opinions of AAS-use as well as their perception of signficant others' approval for their AAS-use. As participants continue to use AAS, other variables and relationships become salient in explaining their decision to continue using these drugs. For example, participants' height and job competence significantly influenced their attitudes towards AAS which, in turn, significantly impacted their intention to continue using AAS.

Summary

Results of this study partially confirmed the majority of this study's hypotheses. Most of the hypotheses reflected the belief that the AAS-Contemplators, being smaller than the AAS-Users still desiring to gain massive amounts of muscle mass, would possess the lowest multidimensional competence, the highest body image concerns, and more positive views

concerning AAS. While the AAS-Contemplators did reveal trends supporting the direction of the hypotheses, the hypotheses could only be partially supported as the AAS-Contemplators could not be significantly discriminated from the AAS-Users in most cases.

This study's findings revealed that male weightlifters using and contemplating AAS-use possessed very different thoughts, beliefs, and perceptions from male weightlifters who were not contemplating AAS-use and from males who did not exercise. More specifically, despite being much bigger and stronger than the AAS-Noncontemplators and the control group, the AAS-Contemplators and AAS-Users revealed greater body image concerns and held more favorable views of AAS than the other groups. The AAS-Contemplators and AAS-Users maintained a greater fear of losing muscle mass and greater desire to gain muscle mass. Incidentially, although the AAS-Contemplators and the AAS-Users possessed very similar attitudes towards their body image and attitudes towards AAS, they did differ significantly on their self-perceptions of the size of their muscles, overall weight, and appearance. The AAS-Contemplators evaluated the size of their muscles, overall bodyweight, and appearance significantly more negatively than the AAS-Users. In terms of the AAS-related variables, the AAS-Contemplators and AAS-Users possessed more positive attitudes of AAS, perceived more peer and contextual gym pressure to gain muscle mass, believed more strongly that significant others would approve of their AAS-use, maintained little desire to listen to significant others' opinions of AAS, and thought that they could find AAS easier than the AAS-Noncontemplators. On the competence measures, the weightlifting

groups possessed significantly lower cognitive, athletic, and social perceived competence than the control group.

When teasing the AAS-User group apart into those individuals who planned on continuing their AAS-use (AAS-Future) and those who did not (AAS-Nofuture), the variables associated with AAS discontinuation could be examined. As such, these exploratory analyses revealed that the AAS-Nofuture, AAS-Contemplator, and AAS-Noncontemplator groups revealed significantly less peer and gym context pressure to gain muscle mass, higher perceived social competence, and lower cognitive competence than the AAS-Future group.

Path analyses conducted to ascertain the variables causally impacting participants' intention to use AAS reflected some differences between first time AAS-use and repeated AAS-use. Participants were more likely to intend to use AAS for the first time if they believed they could find AAS easily, perceived elevated peer pressure to gain muscle mass, intended on competing in a future weightlifting contest, and possessed greater weightlifting dissatisfaction. Desire to use AAS for the first time, in turn, caused participants to perceive greater approval from significant others to use AAS. All of these aforementioned relationships found for first-time AAS-use were also supported for the path model on repeated AAS-use. However, the repeated AAS-use path model also produced some new, significant relationships. For repeat AAS-Users, participants' favorable attitudes towards AAS were significantly impacted by participants' height and perceived job competence, indicating that shorter participants and participants who perceived themselves to be occupationally inadequate held more positive evaluations of AAS. These positive AAS-

attitudes, in turn, causally elevated participants' desire to continue using these drugs. Finally, participants' heightened desire to use AAS resulted in them refusing to listen to significant others' opinions of AAS-use while also skewing their perceptions towards believing that significant others' showed high approval for their AAS-use. The cyclical nature of repeated AAS-use was revealed when escalated desires to use AAS led to heightened perceptions of approval of AAS-use by significant others which then caused more positive attitudes towards AAS (along with low job competence and shortness of stature) which (along with heightened peer pressure to gain muscle mass, perceived ease in finding AAS, desire to compete in a future weightlifting event, and high weightlifting dissatisfaction) finally resulted in intensified desires to use AAS.

As seen from these path models and from the discriminant analyses, many factors influence participants' intention to use AAS. Psychosocial, situational, physical, and weightlifting-related variables all comprise the concatenation of relationships leading to first-time and repeated AAS-use. As will be discussed in the next chapter, these facts should be considered by individuals who design intervention and prevention programs aimed at combatting AAS-use.

Chapter 4

DISCUSSION

The genesis of this study was as much a response to the lack of empirical study on male body image concerns as to the failure of researchers to address AAS-use as in-depth as other substance abuse areas such as cocaine, marijuana, alcohol, and cigarettes. It was an attempt to look beyond the mere categorizations of AAS-users as being male and athletes and into the specific psychosocial and situational components which differentiate and causally impact individuals to use AAS. Such a study is warranted given the dramatic findings that many AAS prevention and intervention programs may actually heighten individuals' desire to initiate AAS consumption (e.g., Goldberg, Bosworth, Bents, & Trevisan, 1990) and that a large proportion of AAS-users are actually very knowledgeable about their drug of choice and willing to risk severe physiological harm in the name of mesomorphy (e.g., Chng & Moore, 1990). It was also an attempt to specify and quantify vague proposals that AAS-use is related to some type of general self-esteem construct (e.g., Klein, 1986, 1989; Olrich, 1990) and body image perception problems (e.g., Brower, Eliopulos, Blow, Catlin, & Beresford, 1990; Brower, Catlin, Blow, Eliopulos, & Beresford, 1991; Klein, 1986). Lastly, this study aimed at ascertaining the psychosocial and situational differences between current and former AAS-users and the causal affect of these variables on AAS-intention. It was thought that such a study would shed some light on the variables which may help coaches, counselors, parents, and educators detect potential and current AAS-users and provide future AAS intervention and prevention programs with specific variables that need to be addressed in order to increase their effectiveness.

This chapter will address the results by first presenting group differences on the psychosocial and situational variables' which influence AAS-use, followed by an examination of the multiple regression and path analyses findings. Towards the end of the chapter, recommendations for improving intervention and prevention strategies will be given as will suggestions for future research in this field.

AAS-Use Incidence Rates

Past AAS research has shown the incidence rates of AAS-use in private health clubs to be exceedingly high. For example, estimates have included 15% (Kersey, 1993), 40% (Frankle, Cicero, & Payne, 1984), and even 90% (Taylor, 1987a). This study revealed an AAS incidence rate of 19% (31 of 167 weightlifters) and a 28% incidence rate of weightlifters either using or contemplating using AAS (46 of 167 weightlifters). To many, this rate may be very high, and is attributed to this study's specific targeting of AAS-users and AAS-contemplators (i.e., a nonrandom sample). This study's data recruiters were told by the author to target the recruitment of all potential and actual AAS-users first, and then all other weightlifters. However, despite this specific targeting plan, the incidence rate of this study was far below those found in the aforementioned other studies. The probable difference in these estimates concerns the geographical locations of subject recruitment. In the previous studies, all of the participants were recruited from warmer weather climates (sun-belt states) where AAS-use has been proposed to be much higher than any other place in the United States (Yesalis et al., 1988). It is commonly thought that in places like the sunbelt states where the weather is much warmer and sunnier than found in northern states, inhabitants are more conscious of

their physical appearance since they are outdoors more often and require less clothing than do inhabitants of colder climates. Thus, the bodies of mesomorphy-conscious males in these places are subjected to the consternation of societal members more frequently and for more months than colder weather inhabitants, which may provide additional motivation to improve their bodies quickly and maintain this "fit" look longer. As a result, these individuals may see AAS as being a logical choice to help meet these goals. Similar to other studies, incidence rates of AAS-use were influenced by participants' competitive weightlifting desires (e.g., Blouin & Goldfield, 1995; Brower et al., 1991; Chng & Moore, 1990; Olrich, 1990). In this study, AAS-Users were more likely to have competed in the past and more likely to plan on competing in the future than AAS-nonusers. Many weightlifters feel that AAS-use is necessary to compete in most levels of weightlifting contests (most notably powerlifting and bodybuilding) in order to "level the playing field" (Olrich, 1990). For example, in this study, 79% of the individuals contemplating AAS-use in the future were also planning on competing in a weightlifting event in the future. Such stay-competitive-at-all-costs attitudes may even extend into "drug-free" weightlifting contests. It has been the author's experience as a competitive, drug-free bodybuilder that, despite drug testing, AAS-use occurs in drug-free contests. Given the ample chemicals and techniques that can mask AAS-use and the common opinion among many bodybuilders that most drug-free shows fail to go all the way through with drug testing their athletes, it is more than likely that some AAS-users compete in drug-free shows. Thus, AAS-use may extend from professional events where huge sums of money hang in the balance to small-town, amateur drug-free events where the winner receives

a trophy and a pat on the back. Of course, in both types of events, participants' sense of physical competence is raised and positive affect heightend. As will be shown later in this chapter, elevating male weightlifters' sense of physical competence can be an especially strong motivator, especially to those who are deficient in this area.

Control, AAS-User, AAS-Contemplator, and AAS-Noncontemplator Group Discrimination on Psychosocial, Situational and Weightlifting-Related Variables

Before the group discriminations on the psychosocial and situational variables related to AAS-use are discussed, it is important to gain a general understanding of the physical characteristics of the group members in terms of age, weight, height, size, and strength. Such a general overview of these actual physical characteristics will provide important bases of comparison when reviewing group members' perceived psychosocial and situational statuses.

Age, weight, size, strength, years lifting, hours lifting, and height. Despite recruiting most members from fitness centers situated in college towns, the mean age of the participants was surprisingly older than anticipated, with the AAS-Users being closer to the 30 year old range. Given the age of the AAS-Users and acknowledging the fact that early AAS-use is more likely to result in chronic use (Yesalis et al., 1988) and of more types of AAS (Yonker et al., 1990), these facts may suggest that the individuals comprising the AAS-User group in this study may represent more "hardcore" AAS-Users (of course, this is only a supposition since age of first use and duration of use were not assessed in this study, but should be in future research). Another reason which may point to "hardcore" AAS-use in this study concerns the finding that one of the main reasons for AAS-use is to improve athletic performance (Chng & Moore, 1990;

Olrich, 1990). Given that some research has suggested that many male former athletes initiate competitive bodybuilding and often AAS-use to stave off the death of their athletic careers (Olrich, 1988) and that many of this study's AAS-Users were also competitive weightlifters (15 out of 31 AAS-Users), it is quite possible that these AAS-Users have been using AAS since the end of high school or college when their formal athletic careers ended. However, one cannot be certain of this since it is unknown as to whether any of these AAS-Users have been competitive in school sports. Future research should explore the link between AAS-use and participants' athletic careers, as this may help intervention and prevention programs better target individuals who are extraordinarily susceptible to initiating the use of these drugs.

It is also noteworthy to consider the age of the AAS-Contemplators (mid-twenties) relative to their weight training history (around 4 years). This finding supports both Olrich's (1990) and Brower et al.'s (1991) findings that mid-twenty year old males with 4-5 years of weightlifting experience may be especially vulnerable to AAS-ideation. Other research studies, sampling from private gyms, have also found their AAS-Users to be in their early to mid-twenties (Blouin & Goldfield, 1995; Chng & Moore, 1990; Kersey, 1993). Perhaps this adoption of favorable attitudes towards AAS has something to do with the lifestyle changes made by many males as they enter the working world. The resulting reduction in time to work-out and consequent decrease in lean body mass and increase in body fat (which they worked so hard to obtain in their college years) may be especially difficult for these individuals to accept. Examining exactly what changes in cognitions occur after 4-5 years of

weightlifting by mid-twenty year olds and why these changes occur at this particular time would be a fruitful topic for future research.

Interestingly, the AAS-Users and AAS-Contemplators weighed signficantly less (in the 150 lb range) than the AAS-Noncontemplators (in the 165 lb range) prior to initiating weightlifting. This confirms other reports that many individuals begin AAS-use due to perceptions of being too thin (which may have rendered them noncompetitive in organized athletics) (e.g., Olrich, 1988, 1990). This fact along with other body image topics will be discussed later in this chapter.

Participants differed dramatically in terms of weight, size, and strength levels, as hypothesized. The AAS-Users were significantly heavier, bigger, and stronger than the other groups. Although they also had a significantly longer weightlifting history than the other weightlifting groups, this was statistically ruled out as causing these differences. It would seem, then, these differences can be attributed to the ergogenic and restorative properties of AAS. The AAS-Users were approximately 20 pounds heavier, a combined 7 inches larger in the chest, arms, and legs, and approximately 300-500 pounds stronger when combining the maximum bench press, leg press, and squat lifts than the other weightlifting groups. In addition, the AAS-Users weightlifted one to two hours longer per week than the other weightlifting groups. This finding may provide evidence for AAS's restorative properties in which AAS allow weightlifters' quicker recuperative abilities (e.g., Goldman & Klatz, 1992) and, based on these size and strength gains, provide additional psychological motivation to weightlift longer hours.

Although the AAS-Contemplators and the AAS-Noncontemplators weighed approximately 190 lbs, the AAS-Contemplators possessed

significantly larger arms, chest, and legs (a combined 5 inches larger) and were significantly stronger in the bench press, leg press, and squat (a combined 200 lbs stronger) than the AAS-Noncontemplators. These are astonishing differences when considering that the AAS-Noncontemplators lifted slightly over 3 years longer than the AAS-Contemplators. The bases for these strength and size differences among these AAS-nonusers, then, may be attributed to group differences in the psychosocial and situational variables that impact the desire to gain muscle mass such as body image concerns and peer pressure which, in turn, affect weightlifting intensity. These issues will be addressed later in the chapter.

Popular opinion maintains that bodybuilders' need to gain muscle mass can be attributed to their attempt at making up for their shorter than normal stature. As Klein (1989) states: "The insecurity regarding traits such as shortness or physical impediments (e.g., hearing impairment) are seen by bodybuilders as 'afflictions' which continue to pull people into bodybuilding decades after the first Charles Atlas ads appeared in comicbooks and men's magazines" (p. 14). This proposition was partially corroborated in this study. While the groups did not differ significantly in height, a multiple regression did show height to account for a significant proportion of participants' attitudes towards AAS. Furthermore, a path analysis showed height to significantly impact participants' attitudes towards AAS which, in turn, significantly influenced their desire to use AAS. More specifically, a negative path between height and attitude towards AAS indicated that the shorter the weightlifter, the more favorably he perceived AAS. As will be discussed further in the path

analyses section, this result appeared to be more relevant for repeat AAS-users than for first time AAS-users.

Physique Variables

Past studies have been content with explaining AAS-use in terms of males' desire to gain muscle mass (Kersey, 1993; Olrich, 1990) or strength (Chng & Moore, 1990), but no studies have attempted to quantify these desires. This study, on the other hand, attempted to delve into other informative physical characteristics of the participants such as their actual and desired body size and the difference between these actual and desired measurements. Such an intricate analysis of participants' physique affords a better understanding of the differences in motivation and body image perceptions experienced by group members. For example, although most males would like to increase their muscle mass (e.g., Taylor, 1987a), perhaps larger differences between desired and actual physical measurements are more likely to diffentiate individuals contemplating or using AAS from those who are not contemplating AAS-use.

Results corroborated Taylor's (1987b) findings, as all males, including the control group, wanted to increase their chest to waist ratio (Vratio). However, the AAS-Contemplators and the AAS-Users significantly differentiated themselves from the control group and the AAS-Noncontemplators by possessing not only a greater Vratio, but by also desiring a greater Vratio, and possessing a greater difference between their actual and desired Vratio (partially suppporting the hypothesis). That the AAS-Contemplators (and the AAS-Users) had the largest chest to waist ratio(s) may be somewhat surprising considering that the AAS-Contemplators weightlifted 3 fewer years than the AAS-Noncontemplators (although they did train approximately 40 minutes

longer per week than the AAS-Noncontemplators). This may reveal a more extreme or more knowledgeable pursuit of weight training. As is often the case in free-weight gyms, weightlifters who are more serious about their mesomorphy goals attempt to train with other serious weightlifters who are often bigger and stronger than them in order to maximize their motivation to gain muscle mass and fight through training plateaus and they are also more avid searchers for advice in gaining muscle (e.g., reading muscle magazines, asking others' opinions). This may account for the AAS-Contemplators possessing the largest (nonsignificant) difference between their desired and actual Vratio (Vratio Difference). That the AAS-Users possessed a smaller, nonsignificant Vratiodiff than the AAS-Contemplators may relate to this supposition as well. AAS-Users who are already larger than most of the weightlifters in the gym probably have very few individuals in the gym whose size and strength they emulate. While the AAS-Users may compare themselves to and emulate the professional bodybuilders pictured in muscle magazines or be motivated to become much bigger than their AAS-using peers, the fact that they are not surrounded on a daily basis by individuals whose great body size and strength they aspire, like the AAS-Contemplators, may limit their size and strength desires. It is one thing to view a picture of bigger bodybuilders and aspire to their great size and quite another to attempt to outperform bigger and more intense bodybuilders on each exercise with heavier weights, more sets, and more repetitions on a daily basis.

Although the Vratio related constructs revealed important physical differences among the groups, the Size related constructs were stronger discriminators of the groups. This is because the Vratio constructs, being ratios,

can conceal as much information as they can reveal as opposed to the Size constructs. Two individuals can differ dramatically in body size despite possessing similar Vratios. For example, an AAS-User who possessed a 49 inch chest and 34 inch waist (49/34 = 1.44) would obtain the same Vratio as an AAS-Contemplator who had a 44 inch chest and 31 inch waist (44/31 = 1.42). Thus, being comprised of non-ratio elements, the body size-related variables provided different and stronger indications of differences in physical measurements among groups.

The AAS-Users and AAS-Contemplators were significantly differentiated from the control and AAS-Noncontemplator groups based on their actual size (Size), desired size (Goalsize), and desired minus actual size (Size Difference). That is, individuals using or contemplating AAS were bigger and wanted to be significantly bigger than the other weightlifters. This supports the finding of many AAS research reports that AAS-Users (and now AAS-Contemplators) desire to add even more muscle mass to their already large body size (e.g., Brower et al., 1991; Chng & Moore, 1990). However, what was especially interesting was the finding that the AAS-Contemplators possessed the greatest nonsignificant size difference (Goalsize - Size), followed by the AAS-Noncontemplators, and then the control and AAS-User groups. More specifically, despite being almost a combined 3 inches smaller in the chest, legs, and arms than the AAS-Users, the AAS-Contemplators' Goalsize was only approximately one half inch smaller than the AAS-Users' goal for these measurements. That is, the AAS-Contemplators and AAS-Users aspired to be nearly the same size despite the AAS-Contemplators being much smaller than the AAS-Users. This finding may lend further support for the aforementiond

supposition that the AAS-Contemplators' desire to gain incredible muscle mass may be psychologically fueled by watching and training with bigger and stronger gym members (perhaps AAS-Users). The AAS-Noncontemplators, who may also train in these gyms with the bigger and stronger weightlifters and who also possess goals to increase their body size, may not be as desparate to resort to AAS to meet their mesomorphy goals because of their reduced body image concerns. These body image differences between the AAS-Noncontemplators and the other weightlifting groups and their impact on AAS-Intention are discussed later in this chapter.

Multidimensional Body-Self Relations Questionnaire (MBRSQ) Variables

Now that participants' actual and desired physical dimensions have been discussed, the logical next step is to address how these participants perceived their bodies and to examine their levels of psychological comfort with these perceived body images. It has been suggested that AAS-Users may suffer from some type of body image distortion problems as AAS-Users often attibute their consumption of these illicit drugs to feelings of not being big enough, despite being exceedingly muscular and strong (e.g., Blouin & Goldfield, 1995; Brower, 1991; Chng & Moore, 1990; Olrich, 1990; Pope & Katz, 1988). Based on these findings, Pope and Katz (1988) proposed that AAS-use may be analagous to "reverse anorexia nervosa" in which AAS-abusers, despite being large and muscular, unrealistically perceive themselves as being too small and weak to the point where these feelings affect their daily activities (e.g., covering the body with heavy clothes in public to disguise their imagined "smallness"). Based on this supposition, it was hypothesized that although the AAS-Users and AAS-Contemplators would both possess more negative body image perceptions of

themselves than the other groups, the AAS-Contemplators would possess the greatest negative body image perceptions of themselves because they were smaller and weaker than the AAS-Users yet they wanted to achieve the massive size and strength of these drug-users.

Because there is no one scale that assesses Body Dysmorphic Distortion (BDD) as defined by the DSM-IV or reverse anorexia nervosa, clinical diagnoses of body image disturbance could not be made in this study. Instead, one of the most reliable and valid questionnaires that detects body image perceptions was used to compare groups' body image perceptions and identify their effects on AAS-Intention. Also, exploratory analyses were conducted in which 6 of the 10 MBSRQ variables were aggregated to give one general score of participants' body image concerns and these scores were compared among groups.

Results of the discriminant analyses using the MBRSQ variables revealed partial support for the hypothesis that the AAS-Contemplators would possess the greatest body image concerns. In most cases on the MBSRQ variables, the AAS-Contemplators and AAS-Users were significantly discriminated from the AAS-Noncontemplators and the control group. The AAS-Contemplators and AAS-Users possessed significantly greater fears of losing muscle mass and greater desires of gaining muscle mass than the other groups, despite possessing very positive body-satisfaction scores. Such muscle mass concerns are major barriers in AAS-intervention programs' attempts to dissuade AAS-Users from using these drugs (e.g., Brower, 1991). AAS-Users rightfully fear that cessation of AAS will result in shrinking muscles and reduced strength (resulting in more negative social comparisons and reduced self-esteem),

causing a psychological addiction to these drugs (Brower, 1993b; Brower et al., 1990). The addiction of AAS will be discussed further in the Intervention and Prevention Strategies section later in this chapter.

As previously mentioned, despite possessing elevated fears of losing muscle mass and desires to gain muscle mass, the AAS-Contemplators and AAS-Users also maintained very positive body-satisfaction scores (BASS). While these elevated BASS scores may appear to indicate that these groups felt satisfied with their physiques, the truth is that the BASS scale centers on how satisfied participants are with their body parts and does not tap into the size issues on which many weightlifters' are obsessed. For instance, while the BASS scale asks participants how satisfied they are with their mid torso, upper torso, and muscle tone (in addition to other body attributes, such as the complexion of their face and color of their hair), it does not directly assess their satisfaction with the size of these body parts. One can be generally happy with the shape and definition of their arms, but be very dissatisfied with their arms' size. Even if groups did rate their upper, lower, and mid torso negatively based on their perceived small sizes, positive scores on other scale items, such as face, hair, and muscle tone satisfaction could have obscured these scores. Assuming that participants felt similarly about their face, hair, muscle tone, and overall appearance, then 4 out of the 9 items on the BASS could have offset any items which were based on size perceptions resulting in nondiscriminative overall BASS scores. The appearance evaluation scale, on the other hand, did not contain these types of general items and did reveal different results from the BASS scale.

When analyzing participants' self-classified weight, self-classified muscle, and appearance evaluation, a different significant finding was revealed: The control group and the AAS-Contemplators were signficantly differentiated from the AAS-Noncontemplators and the AAS-Users. The control and AAS-Contemplator groups perceived themselves to be lighter, possess smaller muscles, and evaluated themselves less positively than the AAS-Noncontemplators and AAS-Users, partially supporting the hypothesis. Interestingly, the AAS-Contemplators evaluated their appearance the (nonsignificantly) least favorably of the groups [although their score was greater than the appearance evaluation mean score obtained from the 997 males sampled by Cash (1994)]. Of the weightlifting groups, the AAS-Contemplators, despite being as heavy and significantly bigger and stronger than the AAS-Noncontemplators, still perceived their weight, muscle size, and appearance significantly more negatively than the AAS-Noncontemplators. Given these findings in addition to the AAS-Contemplators greater fear of losing muscle and desire to gain muscle, it is probable that Pope et al.'s (1993) assertion linking AAS-abuse with reverse anorexia nervosa may be extended to include those individuals contemplating AAS-use.

A final interesting note concerning the MBSRQ variables is that despite possessing the lowest body areas satisfaction, the least perceived weight and muscle size, the least fear of losing muscle size, and least desire to gain muscle size, the control group still evaluated their appearance very positively. While these positive physical evaluation scores may be attributed to the boasting power of these younger, male nonexercisers (in an attempt to save face on physical appearance-related questions), they may also reflect the control

group's less "uptight" attitude concerning their appearance. Since they do not exercise, these individuals are obviously less health conscious and thus less body conscious than the weightlifting groups, and yet, they may be very comfortable with their physical appearance despite acknowledging that they could look better.

Whether the AAS-Contemplators and AAS-Users actually possess BDD or reverse anorexia nervosa is unknown. Although they did possess the lowest appearance evaluation scores, the lowest muscle perception scores of the weightlifting groups, the greatest desire to gain weight, and greatest fear of losing weight, it cannot be ascertained as to whether the AAS-Contemplators and AAS-Users were "preoccupied with these imagined defects" or that these perceptions caused them "significant distress or impairment in important areas of functioning" as signified by the DSM-IV (1994) as being indicative of BDD or that these beliefs were "persistent", "clearly unrealistic", or "concretely affected their daily activities" which Pope et al. (1993) maintain as being characteristics of reverse anorexia nervosa. However, because of their significantly negative body image concerns, it is evident that the AAS-Contemplators and AAS-Users are the most vulnerable to BDD and reverse anorexia nervosa.

As suggested from these discriminant analyses and documented later in the path analyses, participants' body image perceptions appear to drastically skew their interpretations of the world around them. Intense desire to gain weight or marked fear of losing weight appears to make male weightlifters more vulnerable to what their peers have to say about their physique, how they interpret the social context of their gym, and how they interpret illict performance/physique enhancing drugs. These differences in perceptions

were readily apparent when participants' were trichotomized based on their body image concerns (BIC) levels (high, medium, and low). While high BIC may be synonymous with body image disturbance, the latter term will not be used as it connotes a psychological disorder of which these results can not confirm.

Despite being of similar age, weight, height, and strength, BIC groups were significantly discriminated on competence, physique, and AAS-related variables. Groups with medium and high BIC perceived themselves to be more socially and cognitively competent yet less physique competent than their low BIC counterparts. This low physique competence is very understandable considering the high BIC group's negative perceptions of their bodies. In terms of cognitive competence, research on men and women with eating disorders have found them to possess average to above-average intelligence (Edwin & Andersen, 1990) which may be due to their upbringing in families that stress high achievement and perfectionism (at least for women) (Bruch, 1982). Moreover, parents of these families are often perceived to be overdemanding and controlling by eating disordered women, perhaps sparking these women to gain control of their lives by controlling their eating behavior (Bruch, 1982). Whether the same types of families are typical of males with skewed perceptions of their body image is unknown and worthy of further research.

Besides maintaining larger body sizes and Vratios, the medium and high BIC groups were significantly discriminated from the low BIC group on physique variables that measured the difference between participants' goal and actual body sizes. More specifically, these higher BIC groups possessed greater Vratio differences and size differences than the low BIC group. This greater

desire to be bigger in terms of overall body size and Vratio, once again, confirms the higher BIC groups' elevated body image concerns. In fact, of all the variables tested in the discriminant analysis, size difference was the greatest discriminator of the groups (even slightly stronger than participants' perceived physique competence). Because approximately half of the AAS-Users and half of the AAS-Contemplators comprised the higher BIC groups, it is evident that elevated BIC can lead to AAS-contemplation and AAS-use. Thus, just as high body image dysfunction can lead to eating disorders such as anorexia and bulimia nervosa in women, high body image concerns can lead to reverse anorexia nervosa and subsequent AAS-use in some men. This was confirmed when analyzing these BIC groups on the Steroid Variables Questionnaire.

The medium and high BIC groups were discriminated significantly from the low BIC groups on their attitudes towards AAS, AAS-Intention and ability to find AAS. That is, higher BIC groups held more favorable attitudes towards AAS, were more inclined to use AAS in the future, and believed they could find AAS more easily than their low BIC counterparts. In addition, the higher BIC groups were also discriminated significantly from the low BIC group on the peer pressure to gain muscle mass, their gym's perceived contextual pressure to gain muscle mass, perceived approval from significant others to use AAS, and weightlifting dissatisfaction. More specifically, the higher BIC groups perceived greater peer and gym environment pressure to put on muscle mass, greater approval from significant others to use AAS, and less weightlifting dissatisfaction than the low BIC group. Thus, male weightlifters with high body image concerns maintained skewed perceptions of their bodies, their gym

environment, their peers, and their significant others. These skewed perceptions can heighten individuals' susceptibility to initiate any means to increase musculature, even illicit drug use. Alternately, those individuals with lower body image concerns (such as the AAS-Noncontemplators) are less likely to be influenced by their gym and peers to gain body size and are less likely to perceive AAS favorably. It should be emphasized that the skewed perceptions of the high BIC group are not necessarily based on reality, since the members of these groups are actually more muscular to begin with than the low BIC group members.

The possession of high weightlifting dissatisfaction by the low BIC participants can be attributed to the high percent of AAS-Noncontemplators comprising this group. Because the AAS-Noncontemplators trained less intensely and were weaker than the AAS-Users and AAS-Contemplators (who had many members in the higher BIC groups), and because they did not take AAS, they elevated the low BIC groups' scores on weightlifting dissatisfaction.

In sum, when analyzing groups based on their overall body image concerns, high body image concerned male weightlifters parallel women with anorexia nervosa. They possess skewed perceptions of their bodies which are not based on reality. The higher BIC groups tended to be significantly larger in terms of overall body size as well as chest to waist ratio, yet they still possessed lower physique competence and an intense desire to become much larger than their low BIC counterparts. They also suffered from skewed perceptions of their peer and gym's contexual pressure to put on muscle mass, evaluated AAS and the intention to use AAS more favorably, and believed they were highly supported by significant others to use AAS. Such vulnerability to deviant

behavior may be a result of parental pressure to be successful and perfectionistic, as has been found with anorexic women. Past studies on weightlifters with high body image concerns (e.g., competitive bodybuilders) have found them to possess perfectionistic and narcissistic tendencies (e.g., Klein, 1986, 1989). Whether these qualities are actually generated from family dysfunction is a subject which demands future research.

Competence Issues

Because drug abuse has been linked to intrapsychic turmoil, such as very low self-esteem and overall life dissatisfaction (Newcomb & Harlow, 1986), and because past AAS-research has posited that AAS-use and low self-esteem are causally related (Blouin & Goldfield, 1995; Klein, 1986, 1989; Olrich, 1990), this study attempted to further investigate these relationships. However, instead of using a global life dissatisfaction or a global self-esteem scale as has been done in the past, Harter's (1986) self-competence scales were utilized to specify the normative life domains upon which participants' base their feelings of life dissatisfaction and low self-esteem.

Competence issues have been linked to cigarette, alcohol, and marijuana use. For example, Wills et al. (1992) found that young urban adolescents who used the aforementioned drugs revealed academic and social competence problems. This study attempted to further investigate these self-competence issues by using Harter's (1986) cognitive, social, athletic, job, and physique self-competence subscales and her global self-worth measure with adults. It was hypothesized that the AAS-Contemplators would reveal the lowest competence levels on all of these subscales.

In using Harter's (1986) self-competence scales, adaptations had to be made to the scales that were originally constructed for adolescents in order to reflect this study's older male population. Such adaptations included changing nouns used to describe the subject population from "kids" to "guys" so that the original statement of "some kids feel that being good looking is important" was changed to "some guys feel that being good looking is important." Another change made to this scale included using past tense verbs in some statements in order to better reflect an older sample of participants. For example, the original statement of "some kids do well at their classwork" was changed to "some guys do/did well at their classwork." While these scale adaptations were minimal, and, in fact, even mirror the changes made by Harter (1986) to reflect different samples of participants (e.g., changing "kids" to "students" or "people"), there is some reason to believe that these changes affected participants' responses. In this study, all groups of participants possessed scores on all 6 subscales that were at least 1 standard deviation lower than the mean scores Harter (1986) found when she surveyed 70 college males [Harter's (1986) means are presented in Appendix B]; although, it should be noted that this study's participants were much older, around 26 years old, than Harter's sample. Even the control group, which was largely selected from university classes, possessed similarly low scores. In addition, the standard deviations for these measures were much smaller than those found by Harter (1986), indicating that this study's perceived competence means were not affected by extreme scores. This needs to be taken into consideration when reviewing the group competence differences.

When analyzing athletic, cognitive, and social competence together, participants differed most significantly on cognitive and social competence. The control group of university, nonexercising students revealed significantly higher cognitive and athletic competence scores than the weightlifting groups. This finding for cognitive competence may reflect a lack of education in the weightlifting participants as compared to the control group. Cognitive competence does not appear to be related to AAS-use, however, since the AAS-Users and the AAS-nonusing weighlifters could not be significantly discriminated from each other on this variable. Olrich (1990) also failed to find a link between cognitive ability and AAS-use in his qualitative study of 10 AAS-Users. Of these 10 individuals, 6 had completed a 4-year college program (4 of whom had completed graduate training in social work, execise physiology, or medicine) and two others were undergraduate students.

Social competence issues and drug use have been linked in cigarette, alcohol, and marijuana use (Wills et al., 1992). Wills et al. (1992) derived two distinct social competence variables from Harter's (1986) social competence scales, one measuring peer social competence and the other measuring adult social competence, under the assumption that high levels in both of these constructs would aid in protecting adolescent participants from drug use. While the results did partially corroborate the authors' hypothesis, that high adult social competence possessed an inverse relationship with drug vulnerability, the authors also found that peer social competence had a positive linear relationship with drug vulnerability. The authors suggested that this positive relationship was attributed to the drug abusers' high competence feelings associated with their deviant, drug-using peers.

In this study, the control group possessed significantly lower social competence than the AAS-Contemplators and the AAS-Noncontemplators and higher social competence than the AAS-Users. Given Wills et al.'s (1992) aforementioned findings and that only Harter's (1986) original measure of social competence was used in this study, the results may be attributed to differences in the reference groups with whom the groups chose to compare their social competence. For example, the control group, being nonexercisers and probably out of shape, may have a more difficult time making friends, as Western societal standards associate somatic attractiveness with positive intrapsychic and interpersonal characteristics. In fact, Freeman (1987) posits that physical appearance may be the strongest component in influencing judgements and misperceptions. Moreover, Eagly et al. (1991) found that physically attractive individuals are often believed to be socially competent. Internalizing such assumptions from others may explain why fit individuals like the AAS-Noncontemplators and AAS-Contemplators possessed higher social competence scores. Conversely, individuals who are not in-shape (e.g., Freeman, 1985) or who are thought to consume AAS may lead others to form negative beliefs about them, resulting in the social rejection of these individuals (Schwerin & Corcoran, 1992).

Athletic competence, despite being a very weak discriminator of the 4 groups relative to either social or cognitive competence measures, should be discussed. One reason why the control group possessed significantly greater perceived athletic competence as compared to the weightlifting groups may have something to do with why some individuals initiate weightlifting. It has been suggested that many individuals initiate bodybuilding as a result of being

considered too small or weak to participate in competitive athletics (Olrich,1990). As a result, these weightlifters may feel athletically incompetent. Another possible reason for this result may be a simple consequence of age. The control group of university students, albeit nonexercisers, were 1 to 5 years (nonsignificantly) younger than the weightlifting groups and perhaps still possessed a more youthful exaggeration of their hegemonic characteristics (such as was found with their appearance evaluation) and capabilities (e.g., dominating in sport) than the other, slightly older participants.

Despite being significantly correlated, job and physique competence, when analyzed together, did not significantly discriminate among the groups. However, interesting (nonsignificant) trends for physique competence did reveal that the control group possessed a higher mean score than the weightlifting groups on this variable, perhaps indicating the weightlifters' reason for initiating weightlifting in the first place. However, even after weightlifting for 4-10 years, and making significant weight gains since initiating weightlifting (putting on 20-60 pounds of body weight), the weightlifters still held low perceptions of their physique. Because job competence did not discriminate the groups significantly (although the AAS-Contemplators did possess the lowest nonsignificant scores) and because it did eventually significantly predict individuals' attitudes towards AAS in the mulitple regression and path analyses, its discussion will be delayed until the entire path model is presented towards the end of the chapter.

Finally, despite many authors suggestion that users of illicit drugs (e.g., Kaplan et al., 1984; Smith & Fogg, 1978) including AAS (Klein, 1986, 1989; Olrich, 1990) possess low self-esteem, the groups in this study did not differ

significantly on the global self-worth construct. Harter (1986) asserts that her measure of global self-worth is distinctly different from many scales tapping individuals' self-concept and self-esteem because the questions comprising the global self-worth scale revolve directly around the topic of self-worth as opposed to many self-esteem scales which are comprised of a sum or average of a wide variety of self-description statements. The global self-worth scale is meant to ascertain how individuals feel about their worth as persons and is not aimed at providing an amalgamated profile of participants' perceptions of their abilities or characteristics (Harter, 1986). Because many researchers have attempted to discuss bodybuilders in terms of self-concept (e.g., Olrich, 1990) and general self-esteem (e.g., Blouin & Goldfield, 1995), this study's use of the global self-worth scale can be considered an addition or extension of previous research. All groups, including the control group, were approximately one standard deviation below the norm mean scores for global self-worth established by Harter (1986) for university aged males.

Assuming that Harter's (1986) scales were still valid and reliable despite the minor modifications made to them in this study, it is difficult to estimate exactly why all of the participants in this study possessed moderate to low multidimensional competence and low self-worth. Are nonexercisers and weightlifters similarly unhappy and perceive themselves as lacking competence in normative life domains? Given the evidence that males who perceive themselves as not measuring up to Western standards for mesomorphy are more likely to negatively perceive themselves (Eagly et al., 1991), this may not be such a far fetched conclusion. As shown later, all of the groups in this study desired greater muscle mass and lower bodyfat and displayed some level of

body image dissatisfaction. Given this and Freeman's (1987) suggestion that physical appearance is the most potent source of self- and other-perceptions, it is possible that this study's entire sample was unsatisfied with their physiques.

In sum, the results of participants' perceived competence levels in the normative life domains of cognitive, social, athletic, job, and physique competence as well as global self-worth were very low; most were approximately 1 standard deviation below Harter's (1986) established norms for these subscales. This may either reflect significant adapatations made to Harters' (1986) scales for this study rendering them non-valid and non-reliable, or that this study's sample of participants possessed low multidimensional competence and global self-worth. Overall, social, athletic, and cognitive competence did accurately differentiate groups, with the control group possessing the highest cognitive and athletic competence of all the groups and lower social competence than most of the weightlifting groups. The differences in cognitive competence may reflect differences in educational levels between the weightlifters and the control group while the weightlifters' low athletic competence scores may reflect their reasons for initiating weightlifting in the first place. Low social competence scores possessed by the control and AAS-User groups may reflect their internalizations of societal members' negative perceptions of their physical appearance as being either out-of-shape (e.g., Eagly et al., 1991) or big enough to be a steroid-user (e.g., Schwerin & Corcoran, 1992). The other weightlifting groups may have internatilzed others' positive reinforcement of their muscular bodies resulting in more positive social encounters. Whether these negative body image perceptions can lead male

weightlifters to consume illicit drugs to enhance their perceived body image will be considered next.

Steroid Questionnaire Variables (SQV). Three SQV variables that discriminated the AAS-Noncontemplators from the AAS-Users and AAS-Contemplators were the desire to listen to significant others' opinions of AAS-use (Listen), peer pressure to gain muscle mass (Peer), and perceived approval from significant others' to use AAS (Approve). The AAS-Users and AAS-Contemplators were the least likely to listen to significant others' opinions of AAS-use, most likely to feel pressure by their peers to gain muscle mass, and perceived the greatest approval from significant others to use AAS. These results are somewhat consistent with past findings on general drug abuse and AAS-abuse that drug-users, including bodybuilders, tend to be very self-centered (Klein, 1986, 1989), may not possess very good communication skills in dealing with older significant others (Kaplan et al., 1984), are very susceptible to peer pressure to conform to deviant group ways (Kaplan et al., 1984, 1986), and are very skeptical of individuals' who possess negative views of AAS (e.g., Olrich, 1990). Especially important are the impact of peer pressure and the gyms' contextual pressure to increase muscle mass (Context). AAS-Users and AAS-Contemplators experienced the most pressure to gain muscle mass, via jokes made by peers to them about being small and weak and by simply watching bigger and stronger peers train intensely in the gym. In addition, the perceived positive support of their deviant peers for using AAS combined with the desire to avoid listening to their families', relationship partners', friends' negative perception of AAS also significantly influenced the AAS-Users and AAS-Contemplators.

Other SQV variables which distinguished AAS-Users and AAS-Contemplators from the AAS-Noncontemplators were attitudes about AAS (SAQ), ability to find AAS (AASfind), and weightlifting dissatisfaction (Liftdiss). More specifically, the AAS-Contemplators and AAS-Users viewed AAS more positively, believed that they could find these drugs easier, and experienced less weighlifting dissatisfaction than the AAS-Noncontemplators. AAS-Users' very positive attitudes of AAS have also been found by Chng & Moore (1990) and Olrich (1990). Yet, in this study, these favorable attitudes towards AAS were not influenced by weightlifting dissatisfaction, as hypothesized. In fact, it was the AAS-Noncontemplators who were the most dissatisfied with their weightlifting. The AAS-Noncontemplators' high weightlifting dissatisfaction is very understandable considering that the members of this group were smaller, weaker, and were making minimal size and strength gains relative to their weighlifting peers (especially the AAS-Users).

Of considerable importance to this study were the situational variables - the gyms' contextual pressure to gain muscle mass and participants' perceived ability to find AAS. Because psychological variables are proposed to only account for approximately 30% of human behavior (cited in Ross and Nisbett, 1991), the addition of situational variables was expected to account for more of the differences between the groups. The results confirmed this supposition. The AAS-Contemplators and AAS-Users were significantly discriminated from the AAS-Noncontemplators in that they perceived their gym atmosphere to be more influential in their decision to gain muscle mass and felt that they could find AAS more easily than the AAS-Noncontemplators.

AAS-Noncontemplators versus AAS-Users and AAS-Contemplators. Although the general discriminant analyses results have been discussed, the question still remains as to why some male weightlifters decide to use AAS while others choose to refrain from their use. After all, the AAS-Noncontemplators, AAS-Contemplators, and AAS-Users were all selected from the same gyms and thus were subject to the same types of peer and contextual pressure to gain muscle mass and yet only the latter two groups considered using AAS. What makes these AAS-Noncontemplators so resistant to AAS-use? The answer to this question appears to revolve around the group differences on body image perceptions.

As has been shown with anorexia nervosa and bulimia nervosa patients, individuals with skewed perceptions of their body image may resort to drastic measures to change these self-perceptions (Gordon, 1990). Such deviant tactics have been witnessed not only in women, but also in men (Andersen, 1992; Yates et al., 1983) although with far less frequency. Conversely, it is implied that individuals with less body image concerns would be less susceptible to drastic actions aimed at improving their somatotype. In this study, the AAS-Noncontemplators possessed significantly less desire to gain body weight, less fear of losing muscle mass, were significantly more satisfied with their appearance, and possessed lower body image concerns overall than the AAS-Contemplators and AAS-Users. It is these reduced body image concerns that appeared to be the most influential in the AAS-Noncontemplators' adoption of negative views of AAS, resiliency in the face of peer and the gyms' contextual pressure to gain muscle mass, and desire to listen to significant others' opinions concerning AAS-use. This supposition is supported by the exploratory

analyses on the BIC groups in which the low BIC group revealed these aforementioned anti-AAS characteristics as opposed to the higher BIC groups. In sum, the AAS-Noncontemplators' reduced body image concerns made them more resistant to AAS-use by allowing them to shrug off the peer and gym contextual pressure to gain muscle mass, to listen to significant others' opinions of AAS-use, and to adopt negative views of AAS.

Whether any of the variables in this study significantly impacted participants' decision to use AAS cannot be definitively stated from these discriminant analyses, as such analyses can only indicate group differentiation on selected variables. In order to understand the predictive power of these variables on individuals' intention to use AAS, multiple regressions and the path analyses must be conducted. It is to these areas that this discussion now turns.

Predicting Attitudes Towards AAS and the Intention to Use AAS

Multiple Regressions. One of this study's goals was to ascertain the psychological and situational variables which influenced weightlifters' intention to consume AAS. Therefore, the multiple regression predicting AAS-intention will be discussed first, followed by the multiple regression predicting participants' attitudes towards AAS.

Results of the stepwise multiple regression predicting AAS-intention revealed that attitude towards AAS accounted for 61% of the variance of the intention to use AAS, followed by peer pressure to gain muscle mass (which accounted for an additional 6% of AAS-Intention), the perceived ability to find AAS (4% of AAS-Intention), and finally participants' strength levels (2% of AAS-Intention), totalling nearly 74% of AAS-Intention's variance. These findings

strongly support Fishbein and Ajzen's (1975) Theory of Reasoned Action and Ajzen's (1985, 1991) Theory of Planned Behavior. Because Ajzen's (1991) more recent model is thought to capture more intricate relationships between attitudes, intentions, and behaviors, especially in the health domain (Wartella & Middlestadt, 1991), it is presented in Figure 1.

As seen from this model of volitional behavior, attitudes towards behavior possess a direct relationship with intention, as do beliefs about significant others' approval of the target activity (aka subject norm), and participants' perceived behavioral control of the target activity. These variables appear to loosley fit the findings of the aforementioned multiple regression in which male weightlifters' attitudes towards AAS (attitude towards behavior), peer pressure to gain muscle mass (subject norm), and perceived ability to find AAS (perceived behavioral control) significantly predicted AAS-Intention. Participants' strength levels, while not directly accounted for in this model, would be referred to as an external demographic variable by the Theory of Reasoned Action (Fishbein & Ajzen, 1975). The fact that these variables, together, accounted for nearly three-fourths of AAS-Intention extends past AAS research findings. For example, past research has shown that AAS-Users very highly regard these illicit drugs (Chng & Moore, 1990; Fuller & Lafountain, 1987; Olrich, 1990) and are highly influenced by peers who use AAS (Olrich, 1990). This study adds to this past research by revealing the importance of situational variables, such as the ability to find AAS, and weightlifting variables, such as strength levels, in predicting the use of AAS.

Because the attitude towards AAS significantly accounted for a large proportion of AAS-intention's variance, a second stepwise multiple regression

was conducted in order to determine the predictors of participants' attitude towards AAS (SAQ). Results revealed that, similar to the first multiple regression, AAS-intention accounted for 60% of SAQ's variance. This was followed by participants' height (accounted for 2.5% of SAQ), perceived approval of AAS-use by significant others (2.5%), participants' past AAS-use (1.5%), and lastly by job competence (1%), totalling nearly 67% of SAQ's variance. These findings appear to loosely fit a reversal of Bentler and Speckart's (1979) attitude-behavior model (which has been shown to strongly predict general drug use; see Figure 6) in which behavior and intention are better predictors of attitude than the converse.

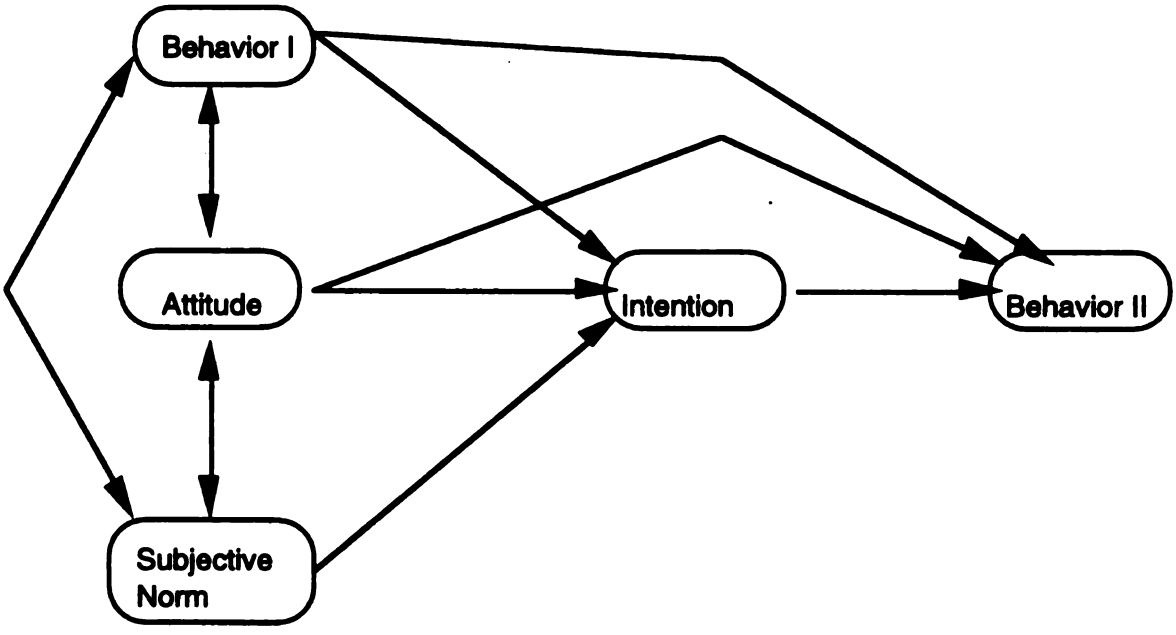

Figure 6. Bentler and Speckart's (1979) attitude-behavior model

Although, in this study, past behavior did not appear to impact participants' intention to use AAS directly as Bentler and Speckart (1979) proposed, it did affect participants' attitudes towards AAS. Not only did participants' past AAS-use lead to more favorable attitudes towards AAS, but so did participants'

intention to use AAS. That the models of Bentler and Speckart (1979), Fishbein and Ajzen (1975), and Ajzen (1991) do not account for reciprocal relationships between intention and attitude, as found in this study, has lead to some criticism of these models (e.g., Liska, 1984). Fishbein and Ajzen (1975), in response to such criticism, have maintained that these reciprocal relationships are normally of smaller magnitude than the non-reciprocal relationships. This is clearly not true in this study, since attitude and intention account for a similarly large percent of each other's variance.

Other than the attitude-intention relationship, Bentler and Speckart's (1979) model was generally supported by this study. The subjective norm variable (peceived support from significant others to enact a target behavior), which is represented in this study by participants' perceived approval by significant others' to use AAS, is indeed related to participants' attitude towards AAS. That is, perceived approval from parents, friends, gym peers, and relationship partners to use AAS leads to more positive attitudes towards AAS. Although variables such as height and job competence are not accounted for in Bentlar and Speckart's (1979) model, Fishbein and Ajzen (1975) may refer to them as extraneous demographic variables and personality traits.

Interestingly, while height did not significantly differentiate the weightlifting groups from each other in the discriminant analyses, it did significantly predict attitude towards AAS. Based on this finding in addition to the ANOVA results, it appears that shorter weightlifters tend to hold more positive evaluations of AAS. This is somewhat surprising considering that the AAS-Users and AAS-Contemplators were only one to two inches shorter than the AAS-Noncontemplators. However, this small disparity may spell the difference

between being 5'8" like the AAS-Contemplators and AAS-Users, which is shorter than the average American male, and 5'10" like the AAS-Noncontemplators, which is the norm for the average American male. It appears that the weightlifting male participants are attempting to become more muscular (via AAS) to make up for their shorter stature than their male non-exercising counterparts.

Despite its inability to significantly distinguish one weightlifting group from another, job competence does significantly predict participants' attitude towards AAS. While no drug-use or AAS-use research to-date has revealed such a finding, this result does support the reasoning behind the hypothesis that the AAS-Contemplators would possess the lowest multidimensional competence. It was thought that the desire to conquer a normative domain such as one's own physique via AAS may result from low multidimensional competence in other normative domains such as at an occupation. This may be especially true for older males. Because these weightlifting participants were around 27 years old, the majority of their time and perhaps their (male) identity are based upon their jobs. Older males who feel job incompetent, perhaps affecting their masculinity feelings (e.g., Olrich, 1990), may begin to possess more favorable attitudes towards areas which bolster their masculinity, such as getting more muscular via AAS. An alternate interpretation of this result is based on Klein's (1986, 1989) findings that many serious weightlifters tend to take jobs which allow them the flexibility and training time to concentrate on gaining large quanitities of muscle mass. Because these types of jobs tend to be very low paying and of questionable status, participants in these jobs may care very little about them except that they pay for food, gym supplies, etc. As a result of these

negative job appraisals, these male weightlifters may begin to believe that they cannot perform well at any job. Although Klein based his studies on professional bodybuilders in Southern California, his findings are likely to be relevant to this study's participants. The author knows of many AAS-Users and other very serious weightlifters who take cashier, bouncing, and gym-related jobs for their relaxed schedule so that they have the necessary time to train 2 to 3 times per day.

While these multiple regressions do reveal some very interesting relationships among the variables, they can be misleading. After all, multiple regressions provide a simple snapshot of the relationship among several variables. In order to see the larger picture in which all variables' relationships are accounted for, structural equation modeling must be conducted.

Path Analyses

Three path analyses were conducted in this study. Because the goal of this study was to understand the psychosocial and situational variables which impact participants to use AAS, the first path analysis was limited to these variables. However, after finding that some of the other variables such as height were significant predictors of AAS attitudes in the multiple regressions and reviewing the AAS literature which implied that several other variables may significantly predict AAS-Intention (such as the desire to compete in weightlifting contests), another path analysis was conducted using 4 new variables. Lastly, because all 3 weightlifting groups were used in the first 2 path analyses, it was unclear as to what variables impacted participants' decision to use AAS for the first time versus those variables that contributed to participants' repeated AAS-use. Thus, a final path analysis was conducted in which the

AAS-Users were dropped out of the analysis, so that first-time AAS-use could be compared to previous path models of repeated AAS-use.

The path models will be interpreted first by addressing the variables not associated with the target of this study, AAS-intention. Later, those variables indirectly and directly affiliated with AAS-intention will be discussed. The second and third path models, because they are very closely related to the thoroughly reviewed first path model, will only focus on variables and relationships which differ from the initial path model.

Results of the first path analysis of the psychosocial and situational variables which impact AAS-Intention revealed that participants' weightlifting dissatisfaction was moderately and positively, causally impacted by participants' perceived body areas satisfaction and negatively impacted by participants' desire to gain body weight (accounting for 10% of weightlifting dissatisfaction's variance). That is, participants' dissatisfaction with their bodies and preoccupation with gaining weight caused them to become more dissatisfied with their weightlifting. These very straightforward relationships revealed that weightlifters' perceived performance in the weightroom relied heavily on their need to gain muscle and feel good about their bodies. In nonathletes, satisfactory weightlifting peformance may become a key ingredient in individuals' sense of identity and self-esteem especially if they feel incompetent in other life domains (e.g., Klein, 1986; Olrich, 1990). However, despite improvements in weightlifting performance, weightlifters' can become very dissatisfied with their weightlifting if they are preoccupied with gaining weight. This need to become big has been cited by Brower and colleagues (e.g., Brower et al., 1991; Brower, 1992a) as one of the main reasons for AAS-

Users' psychological dependence to AAS. Because individuals' identity becomes directly associated with the size of their muscles, perceived slow growth or loss of growth can directly impact how one sees onself especially when comparing one's self to other weightlifters.

Several variables impacted participants' attitudes towards AAS: Job competence, intention to use AAS, and perceived approval by significant others to use AAS. In terms of participants attitudes towards AAS, job competence revealed a small, negative significant causal path, perceived approval by significant others to use AAS showed a small, positive significant causal path, and the intention to use AAS possessed a large, positive significant causal path. Feelings of job inadequacy, intentions to use AAS, and beliefs that significant others approve of AAS-use resulted in participants' favorable attitudes towards AAS (accounting for 62% of SAQ's variance).

As already discussed in the multiple regression section, negative performance evaluations in areas which are central to one's life, such as a job to a 27 year old, can lead to nonnormative attitudes about deviant objects or behaviors. Such a need to master a life domain revolves around people's need to feel a sense of control in their life (Levin, 1994). Failure to perceive a sense of control over one's life can lead to learned helplessness and depression (Seligman, 1975) as well as a sense of meaningless in life; all of which have been linked to drug use (see Newcomb & Felix-Ortiz, 1992). Males bent on mastering a domain can minimize the potential situational barracades surrounding life domains (such as dealing with co-workers' personalities at a job or lacking required equipment in a sport) by concentrating their efforts on the one domain which is readily discernable, perceived to require little skill,

malleable; individualistic, and influential of self and others: their bodies. In order to make-up for other perceived deficiencies in life, such as their jobs, males may begin to possess more favorable attitudes towards means which can quickly and dramatically help them master their bodies - such as AAS. Olrich (1990) found parallel results in which participants recounted their reasons for initiating bodybuilding and AAS. Many of Olrich's (1990) participants felt they could not perform well enough to master a domain which was central to them as young males - athletics. They were either performing poorly relative to their opponents and teammates and/or receiving negative peformance feedback from these individuals and their coaches. As a result of this perceived attack on their sense of identity and self-concept, the participants sought a way in which to level the playing field - weightlifting and later AAS. In both this study and in Olrich's (1990) study, participants' perceived incompetence in a masculine normative domain that was central to their identity and self-concept eventually lead to the initiation of weightlifting and AAS.

Participants' perceived positive approval of AAS-use from significant others also resulted in their adoption of favorable attitudes towards AAS. Because the perceived approval by significant others to use AAS revolved around friends, parents, and relationship partners and because the AAS-Contemplators' and AAS-Users' mean scores were between 2.7 and 2.9 on a 5.0 scale, this may indicate that participants did not perceive all of these significant others to approve of AAS-use. Based on the significant peer pressure to gain muscle mass and their low desire to listen to significant others concerning AAS scores, it seems most likely that participants who held positive attitudes of AAS based these attitudes on peers who implicity encouraged AAS-

use (via jokes and comments centering on being small and weak) and disregarded any negative opinions of these drugs. Additional support for AAS-use can come also from relationship partners as there have been reports in the AAS literature of females approving of AAS-use because of the drugs' amplifying effects on their partner's sexual aggressiveness and energy (Olrich, 1990). These types of responses which are central to males' sense of masculine identity were probably central to the formation of participants' favorable attitudes towards AAS.

The strongest path causally affecting SAQ came from AAS-Intention, indicating that contemplating the use of AAS results in the adoption of favorable attitudes towards AAS. While the multiple regressions showed that the relationships existing between SAQ and AAS-Intention were similarly strong, because each variable accounted for approximately 60% of the other's variance, the path analysis revealed that AAS-Intention produced a stronger causal influence on SAQ than the reverse. Once again, this highlights the weaknesses of several highly regarded attitude-behavior models such as The Theory of Reasoned Action (Fishbein & Ajzen, 1975), The Theory of Planned Behavior (Ajzen, 1991), and Bentler and Speckart's (1979) attitude-behavior model as none of these models reveal a causal path from intention to attitude. One explanation for this intention-attitude causal relationship may reside within Festinger's (1957) cognitive dissonance theory.

According to Festinger (1957), two related cognitive elements (i.e., things people know about themselves, their behavior, and their surroundings) which are true and which are perceived to be inconsistent with each other can create a sense of stress within an individual. For example, a smoker who knows that

cigarettes cause cancer can become negatively aroused over these two inconsistent items of information (smoking and the resulting cancer). According to Festinger (1957), people are driven to reduce this negative arousal by either changing one or more of these cognitive elements or by adding consonant elements, thereby reducing the inconsistencies between the elements. For example, smokers may choose to stop smoking (changing a cognitive element), choose to disbelieve the health risks associated with smoking (changing a cognitive element), or may rationalize their behavior by insisting that smoking helps keep their weight down or that they do not smoke enough to cause cancer (adding consonant elements). While the addition of consonant elements does not eliminate the dissonance between the incongruous elements, it does reduce the magnitude of the dissonance and the negative arousal that goes with it.

Individuals who are determined to develop their bodies quickly and dramatically (cognitive element) may choose to consume AAS to meet these goals. The negative arousal associated with AAS' health risks (dissonant cognitive element) can be reduced by either choosing not to use AAS (changing a cognitive element), or, in this case, choosing to believe that AAS are not that bad (e.g., Chng & Moore, 1990; Olrich, 1990), that they will be very careful with these drugs so as not to cause physiological problems, or that the addition of muscle mass, sexual potency, and training energy all outweigh any potential negative side effects (adding consonant elements). Participants may also choose to avoid any information which may result in more dissonance between the elements (e.g., AAS-Contemplators and AAS-Users expressed less of a desire to listen to significant others' opinions of AAS than the AAS-

Noncontemplators). There is a plethora of pseudo-scientific literature in the bodybuilding arena, including the World Wide Web, which touts the benefits of AAS, human growth hormone, and other synthetic anabolic derivatives (and advices individuals on the types and amounts of drugs to take), and which repudiates the empirical research on the negative side-effects of these drugs, thereby helping to reduce the dissonance associated with AAS-use. Another contributing factor to the dissonance-reduction associated with AAS-use is the perceived lack of physiological problems affecting past AAS-users, especially those who are now successful. Former celebrity users of AAS such as Arnold Schwartzenegger, Lou Ferrigno, NFL superstars, and WWF wrestlers are believed to possess little negative drawbacks from their past AAS-use. This can create in AAS-users and AAS-contemplators the belief that: (a) AAS are not that bad in general; (b) The media and scientific community create negative AAS propaganda in order to publish their articles (e.g., Olrich, 1990); (c) That they will not be negatively affected by AAS since they will take much smaller amounts of AAS than the amounts taken by these unharmed successful former athletes; and (d) They will stop immediately if they ever see any negative side effects. All of these rationalizations for their intention to use AAS can reduce dissonance associated with AAS and create more positive attitudes towards these drugs.

Especially noteworthy in reducing the dissonance associated with AAS-use is the skepticism of individuals involved with AAS towards the medical and scientific community. Although this skepticism is aimed at reducing cognitive dissonance, there is some validity to this skepticism. For many years, the scientific and bodybuilding communities were at-odds concerning the

effectiveness of AAS on athletic peformance, building muscle mass, and recuperative effects. Many scientists who published papers on the ergogenic ineffectiveness of AAS and the morbidity and mortality associated with these drugs received national news coverage, widely disseminating this information across the world. Yet, the bodybuilding communities, relying not on empirically confounded studies of guinea pigs, rats, and untrained humans (see Haupt & Rovere, 1984) but on their own trials and errors with these drugs, found antithetical results. Many bodybuilders have seen the incredible impact of AAS-use on strength, size, and training intensity, directly dispelling these scientific reports. A perfect example of the contraindication experienced by bodybuilders to the warnings of the medical community can be found in Olrich's (1990) study in which one of the interviewed AAS-Users states:

> "The PDR, Physicians' Desk Reference", they talked, they did for years, they don't anymore, that all the drugs concerning anabolic steroids that they were being used on the black market were sold as 'they will not enhance athletic ability.' Well, that's really pleasant to read that and also know that in Drug Free Nationals for powerlifting, the totals were about 700 pounds different. Well, that can't tell me that 700 pounds is not athletically enhanced. So, yes, I think it is a media hype. They're going to take it, and run with it, and exploit it for every benefit it's worth. I think if you were to sift it all out maybe five percent might be a reality at best. I think most of it is hype." (p. 95).

Bodybuilders' skepticism of the negative reports on AAS-use, the widely held perception that the scientific, and especially the medical community, are always finding contradictory data on every medical topic of concern, the perceived lack of morbidity and mortality data associated with AAS, and the need to become huge have all helped AAS-Users and AAS-Contemplators reduce the negative cognitive elements associated with taking AAS. As will be

discussed later, programs aimed at combating AAS-use need to take these elements into account if they are to improve upon the inefficaciousness of past AAS-prevention and intervention programs.

The factors causally impacting AAS-Intention were attitudes towards AAS, peer pressure to gain muscle mass, appearance evaluation, and the perceived ability to find AAS (accouting for 55% of AAS-intention's variance). Since much has already been discussed concerning the AAS-attitude/AAS-Intention link, the other causal paths will be examined. Peer pressure to gain muscle mass possessed a small, positive causal path with AAS-intention indicating that perceived peer pressure to put on muscle mass causally influenced individuals to contemplate using AAS. Receiving jokes about being small and wishing they were as strong as some of their weight training friends (who may be AAS-Users) causes some weightlifters to consider ways in which to level the playing field. In fact, not only can peers provide individuals with the impetus to initiate AAS-use, they are the ones most likely to supply friends with AAS (e.g., Chng & Moore, 1990). This is crucial considering that the ability to find AAS possesses a small, positive causal path with AAS-Intention. Chng and Moore (1990) also found from their survey of 57 AAS-Users (35 were males) that one of the main reasons that they chose to use AAS was because "it was freely available" (p. 16). This shows how important situational variables are to drug-use and why classifying AAS as a Schedule III drug along with opium, morphine, amphetamine, and methamphetamine (Sherman, 1992) is logical in terms of reducing the availability and the use of AAS. This finding also underscores one reason why individuals involved or seeking to become involved with AAS frequent gyms in which these drugs are believed to be easy to find. It is not

mere coincidence that AAS-Users tend to congregate together in such places which may be considered "gateway gyms" in which an assortment of anabolic drugs may be available. Most AAS-Users, after all, use a number of different anabolic drugs at one time (aka, stacking) and in vast quantities (VanHelder et al., 1991).

Lastly, participants' evaluation of their appearance can causally impact individuals' intention to use AAS. Appearance revealed a small, positive causal path with AAS-Intention, indicating that the more favorably participants' evaluated their bodies, the more likely they intended on using AAS in the future. This counterintuitive finding seems to point to the "more is better" syndrome often expressed by AAS-Users. That is, because these participants' positive evaluations of their bodies hinge on their size and strength, they believe they will like their bodies even more when they become even larger and stronger. Considering that the AAS-Contemplators and AAS-Users possessed mean scores of approximately 3.75 on a 5.0 scale for appearance evaluation, it appears that these individuals believe that they have room for improvement in terms of building larger bodies. It's as though these individuals believe that "if I like my appearance when my chest is 50 inches, then I'll really like my appearance when it is 60 inches". Therein lies the problem; a vicious circle is set into motion when positive evaluations are centered on size and strength which becomes dependent on AAS-use. Unfortunately, Olrich (1990) has shown that the same vicious circle is evident even after weightlifters begin using AAS. AAS-Users may become larger and stronger, but their goals for even more size and strength become enmeshed with continued AAS use.

AAS-intention, in turn, causally impacted attitudes towards AAS, the desire to listen to significant others' opinions of AAS, and the belief that significant others approve of AAS use. That is, participants' intention to use AAS causes them to adopt more favorable attitudes of AAS, to refuse to listen to family, friends', and relationship parters' opinions of AAS, and to perceive high approval of AAS-use from these significant others. The fact that AAS-intention possessed a small, positive causal path with the desire to listen to significant others' opinions of AAS-use and a moderate, positive causal path with the perceived approval of significant others to use AAS appears to indicate AAS-intenders' selectively attend to others' opinions of AAS-use. They simply turn away from significant others' possessing negative opinions of AAS-use and listen to individuals maintaining positive opinions of AAS-use. This finding confirms one of Festinger's (1957) proposals concerning individuals' attempt to reduce cognitive dissonance: Avoiding information which may result in the increase in magnitude of dissonance and seeking consonant information which reduces the magnitude of cognitive dissonance. In other words, by listening to what they want to hear and rejecting what they do not want to hear, AAS-Intenders can build a strong cognitive case for initiating an illicit acitivity which has many negative psychosocial, physiological, and moral ramifications. As one of Olrich's (1990) participants summed it up: "I was so anti-steroid when I started bodybuilding. I mean, I was very, very, very naive about the thing. And a lot of it was misinformation, reading the wrong things." (p. 80).

That AAS-Users and AAS-Contemplators attended to some significant others and refused to listen to others concerning AAS-use may indicate relationship problems. Because the perceived approval of significant others to

use AAS and the desire to listen to significant others' opinions concerning AAS included family, friends, relationship partners and gym members as targets of their perceptions in addition to the fact that participants' scores on these variables were around the median of their respective scales, it is possible that participants' answered items pertaining to family, for example, similarly on both scales. For example, an AAS-Intender who possessed a poor relationship with his parents will cause him to not listen to his parents' opinions of AAS-use (thus elevating the Listen score) and perceive their low approval for AAS-use (thus reducing the Approve score). The converse would occur if participants possessed positive relationships with gym members (especially AAS-using peers). Thus, it is very possible that relationship problems may govern participants' desire to listen to and perceive approval from significant others. Of utmost interest are weightlifters' relationships with their parents. General drug abuse researchers have found drug users tend to experience poor social adult competence (Kaplan et al., 1984) and poor family relationships (Kaplan et al., 1986) and that in some body image related areas, such as eating disorders, males have been suggested to possess family problems (Andersen, 1992). More specifically, Andersen (1992) posited that poor father-son relationships may result in eating disorders:

> "Father-son issues relating to the onset and maintenance of eating disorders have not been fully explored. These issues may influence the dynamics associated with weight loss. Of the male eating-disordered patients seen at the Eating and Weight Disordered Clinic at The Johns Hopkins Hospital, some have reported losing weight to avoid appearing like an overweight father with whom they were conflicted and wished to avoid any similarity" (p. 93).

Since AAS-use has been linked to an eating disordered-like dilemma [Pope & Katz's (1988) reverse anorexia nervosa], it is possible that AAS-Users are using

these drugs to avoid any similarity to a frail, thin, meek, or somehow "unmasculine" father. Or, perhaps, these drugs are taken to become bigger and stronger than an overbearing father. This issue has not been addressed and deserves some attention in future AAS research.

While the types of consonant items used by AAS-Users to reduce the cognitive dissonance associated with AAS-use has already been discussed in this chapter, further examples are warranted given the Listen and Approval path analysis results. Participants use many different types of rationalizations to overcome potential moral dilemmas experienced by AAS-Users, as documented in Olrich's (1990) study. Blatant scientific misinformation, medical contradictions, and media spin were all used to reduce the immorality associated with AAS-use. For example, one of Olrich's (1990) educated AAS-Users stated:

> "But the whole moral thing, I have the highest respect for true academia, but I have nothing but disregard for academia which will take media at face value. And as far as I'm concerned, there is no excuse, on an academic level, for misinformation. I mean, that's just as bad, that's bad academia. That's just outright bad studying. You're relying on media for your attitude. What you're doing, as a sociologist, I've done some studies, too, where you're leaning one way, but you should be going into it looking at any type of thesis. An objective standpoint of saying what does this information tell me. And even the way some of the questions are geared, maybe I have a problem with the level of naiveté. Like I told you, this question is really saying tell me about side effects, rather than saying how blown out of proportion are the side effects that we know. So I get into that anyway.
>
> But the whole moral thing, I mean what I said about the T.V. show about plastic surgery, and the whole Ben Johnson thing. I mean, the first day's paper, Ben Johnson of Canada and everything. The next day, it's like 0 to 0 in 9.3 seconds. Oliver North can sell arms to Iran, and he says he loves his country. And all of a sudden, he's a national hero. Ben Johnson says he took steroids to win a gold medal for his country, and he's a disgrace. I can't understand the way the public...why the public is playing to this thing. When all the information is there. I've got medical texts that will list drugs, and say it has, right in the sidebar, risk of overdose, risk of dependency, all

> these things for all these steroids, it's none, none, none. Testing rats and giving them 400 times their bodyweight in Decadurabolin and saying no adverse effects." (p. 97).

Besides the intention to use AAS, Listen was also causally impacted by participants' body areas satisfaction. In addition to AAS-Intention, participants level of body areas satisfaction possessed a small, positive causal path with Listen, indicating that the more satisfied participants were with their bodies, the less likely they would listen to significant others' opinions on AAS-use. This counterintuitive finding, once again, points to weightlifters' belief that although they like their bodies, they believe they will like them more when they are bigger. Of course, the problem with this, as already stated, is that the bigger equals more satisfied equation appears to be incessant and circular as shown in Pope et al.'s (1993) "reverse anorexia nervosa" paper. This cycle can lead to AAS-use and to AAS psychological dependency (Brower, 1991; Olrich, 1990).

When the variables of height, future desire to compete in a weightlifting event (Compfuture), past weightlifting competition history (Compbefore), and bodyweight prior to initiating weightlifting were used in addition to the other aforementioned psychosocial and situational variables in a new path analysis, several relationships changed. Three MBSRQ variables (appearance evaluation, body areas satisfaction, and the desire to gain bodyweight) dropped out of the path analysis, two added variables emerged (height and the desire to compete in a future weightlifting event), and one new relationship became apparent (weightlifting dissatisfaction relationship with AAS-Intention). Although providing nonsignificant differences between groups, height proved to be a significant causal influencer of weightlifters' attitudes towards AAS. The

small, negative causal path between height and attitude towards AAS revealed that the shorter participants' were, the more positive they viewed AAS. To-date, no AAS-research studies have shown such a relationship. Apparently, being an inch or two shorter than the average American male (5'10"), like the AAS-Users and AAS-Contemplators, can be a strong motivating force to enhance male weightlifters' masculinity in other controllable areas - their bodies. However, it appears that simply toning or defining their bodies may not be good enough for these individuals. Rather, adopting favorable attitudes towards AAS, which significantly influences the intention to use AAS, appears to be a way to ameliorate the negative stigma associated with being short for some of these weightlifters. Using a path model which contains actual physical measurements, such as height, in addition to participants' beliefs and perceptions is somewhat of an anomaly in the psychological literature. It highlights the importance of considering all factors when attempting to understand human behavior and should be considered in future research.

Besides height, the desire to compete in a future weightlifting even (Compfuture) and weightlifting dissatisfaction (Liftdiss) showed new relationships in this path model. Both of these variables revealed a moderate, negative causal path with AAS-Intention, indicating that the greater participants' intention to compete in a future powerlifting, bodybuilding, or Olympic Weightlifting event and the greater their weightlifting dissatisfaction, the greater was their intention to use AAS in the future. Past AAS-research has shown a link between AAS-Use and competitive athletic desires (e.g., Brower, 1991; Chng & Moore, 1990) especially in weightlifting-related events (e.g., Blouin & Goldfield, 1995; Kersey, 1993; Olrich, 1990). This desire to use AAS for future

competitive weightlifting events may indicate a couple of mindsets held by weightlifters: (a) The need to be successful in a normative life domain (especially a very masculine and controllable one); and (b) The perception that the only way they can stay competitive in their sport is to use AAS (even in drug-free contests). Because these two areas have already been discussed at length previously in this chapter, the Liftdiss relationship will be discussed.

Confirming the rationale behind the hypothesis that the AAS-Contemplators would possess the greater weightlifting dissatisfaction, participants' weightlifting dissatisfaction causally influenced their desire to use AAS. Being a mediator of participants' size and strength levels, which are highly valued commodities, and believed to be a genetically limited factor by many, weightlifting performance needs to be improved in order for participants' to reach their body goals. Since it is not uncommon for size and strength levels to plateau for months or years (depending on participants' knowledge of scientific training, nutritional, and recuperative principles), participants' may begin to believe that they are genetically limited to their current size and strength statuses. As a result of their psychosocial and situational stressors to gain muscle mass, participants may believe that the only route to their size and strength goals is AAS.

It should also be noted that although it could not be tested in the path analysis, participants' past AAS-use may causally influence the continuing use of these drugs. Bentler and Speckart's (1979) research on general drug-use revealed past behavior's strong influence on future behavior. This would seem to be the case for AAS-Users given the fact that the past use of AAS possessed a strong, positive correlation coefficient with attitudes towards AAS and with

AAS-Intention and that AAS-use can result in psychological and physiological dependency (Brower, 1991).

In the final path analysis conducted, the variables causally impacting first-time AAS-use was desired. Thus, the AAS-Users were thrown out of the analysis and the previous path model was rerun and trimmed. Several changes occured. First, job competence's and height's causal paths dropped out of the analysis, indicating that these variables may only become significant influencers of participants' attitudes towards AAS during repeated AAS-use. That is, shortness of stature and feelings of job incompetence may only become salient for repeated AAS-Users. Klein (1986, 1989) noted that many serious bodybuilders are forced to take underachieving, low-paying jobs that afford them the flexibility and time needed to devote themselves to gaining excessive muscle mass. Based on this premise and this path analysis finding, it appears that these serious weightlifters may only begin to feel incompetent at a job after they have held several of these underachieving type occupations and that feelings of job competence do not initially lead weightlifters to start using AAS (or that they have less of a role when compared to the other variables). Height also appears to have no or less of an effect on weightlifters' desire to start using AAS. Perhaps watching taller, relatively strong peers (such as the AAS-Noncontemplators) weightlifting provides individuals intending on using AAS with the desire to excessively out-muscle them if they can not be taller than them.

Two other relationships dropped out of this new path analysis: SAQ's causal influence on AAS-Intention and AAS-Intention's causal influence on Listen. Apparently, participants' attitudes towards AAS does not influence their

desire to use AAS for the first time. Considering that AAS-nonusing weightlifters are usually aware of AAS's negative side-effects as well as their ergogenic effects (e.g, Goldberg et al., 1990) and have formed some sort of opinion about them, the fact that this opinion did not influence their desire to use AAS may be another indicator of cognitive dissonance control at work. Given that the majority of information disseminated on AAS is negative and that AAS-Contemplators train in a gym which is filled with AAS-Users who are skeptical of this negative "propaganda", it would seem that individuals contemplating AAS-use would also be somewhat skeptical of AAS. Yet, they would not be so skeptical as to turn off any negative opinions of these drugs from others since they may be in the process of weighing the pro's and con's of AAS-use (thereby accounting for the lost AAS-Intention-Listen relationship). However, because they have not yet used these drugs themselves and therefore may possess relatively less developed attitudes about these drugs than their AAS-using counterparts, it makes sense that their formative opinions do not influence their desire to use AAS. Rather, what may be more salient influencers of their AAS-Intention are their desire to be bigger, peer pressure to be bigger, desire to compete in the future, and their ability to find AAS coupled with the fact that other AAS-Users in their gym may not reveal any physiological or psychological problems associated with these drugs.

Two new relationships emerged in this path analysis. Participants' perceived weight level (Selfweight) possessed a small, positive causal path with their weightlifting dissatisfaction and their perceived ability to find AAS (AASfind) possessed a small, positive causal path with Listen and AAS-Intention. In the Selfweight-Liftdiss relationship, the lighter participants'

perceived themselves, the more unsatisfied they became with their weightlifting performance. This finding supports the other results found in this study that the desire to gain muscle mass and the fear of being smaller can impact, albeit indirectly, the intention to use AAS. In the AASfind-Listen relationship, the easier participants perceived their ability to find AAS, the less likely they were to listen to others' opinions of AAS-use. This type of reliance on situational factors and not on more systematic information like others' opinions of AAS to determine their AAS-Intention may be explained by Chaiken, Liberman, and Eagly's (1989) heuristic-systematic model of persuasion. According to this model, individuals may systematically and/or heuristically process persuasive communication. If they choose to rely solely on systematic processing, participants will analytically scrutinize the information relevant to the targeted task while if they choose to solely rely on heuristic processing, they will focus on simple decision rules or non-systematic cues in their judgment. While both types of processing can be conducted concurrently, one process can be favored over the other in certain situations. For example, when motivation and/or ability to process systematically is low, heuristics may be relied on. In this case, individuals who are contemplating using AAS for the first time may be somewhat confused over the contrasting information on these drugs. The medical research reports (which are reviewed in bodybuilding magazines in some form) admonishes against them while some gym members, who have actually used them and who have explained the bases for their skepticism against the medical community, encourages them. As a result over this conflicting information, participants' systematic processing ability may be overtaxed and may decide to choose to use AAS simply because they are

available (e.g, Chng & Moore, 1990). The easier participants' can find AAS, the less they will try to spend their energy sorting out all of this disparate information from others because, as Chaiken et al. (1989) maintains, "people are 'economy-minded souls' who wish to satisfy their goal-related needs in the most efficient ways possible ... with less effortful to more effortful modes of information processing' (Eagly & Chaiken, 1993).

The results of these path analyses have revealed that for first-time AAS-use, peer pressure to gain muscle mass, desire to compete in a future weightlifting event, the ability to find AAS, and weightlifting dissatisfaction all cause increased desire to use AAS. Intention to use AAS, in turn, causes individuals to perceive support from significant others for their AAS-use. Later, as repeat AAS-Users, male weightlifters' positive attitudes towards AAS (resulting from feelings of job incompetence, shortness of stature, and perceived approval from significant others' to use AAS) further influences their intention to consume more AAS. This heightened intention to continue to use AAS causes them to direct their attention away from the negative people and opinions held by significant others' towards AAS-use and towards those individuals and opinions that help to rationalize their AAS-use. Such selective attention on people and opinions helps to reduce the cognitive dissonance associated with the physiological and psychological side-effects of AAS-use.

Implications

Prevention/Intervention of AAS-Use

Compared to cocaine, marijuana, alcohol, tobacco, and other drugs, little research has been conducted on AAS-prevention/intervention strategies. Existing attempts at such strategies have either been ineffective or have actually

exacerbated participants' desires to use AAS. As such, this section will attempt to highlight potential AAS intervention/prevention strategies by: (a) Examining past attempts at establishing AAS-prevention strategies; (b) Reviewing the characteristics of the AAS-Noncontemplators and the former AAS-Users who have discontinued use of these drugs; (c) Presenting research models which have faired well in preventing general drug abuse; and (d) Based on this study, suggesting critical elements on which future AAS-prevention/intervention programs should concentrate.

Past attempts at erecting AAS prevention programs have been grounded solely in educational tactics (e.g., Goldberg et al., 1990) under the assumption that individuals in high risk categories for using AAS (e.g., athletes) know little about these drugs. It is also assumed that if these vulnerable individuals were educated about the negative side effects of AAS, they would become fearful of these drugs and refrain from their use. Such educational programs have showed not only that they may not deter drug-use, but that they may actually heighten individuals' desire to use these targeted drugs (e.g., Goldberg et al., 1990; Goodstadt, 1980; Lawrence & Velleman, 1974). In Goldberg et al.'s (1990) study on educating 6 varsity high school football teams about the negative physiological effects and the ergogenic effects of AAS, participants revealed (nonsignificantly) more knowledge about AAS's detrimental health effects and significantly more favorable attitudes towards these drugs. Pre-post- mean scores revealed that, after educational sessions, participants were: (a) Significantly more likely to take AAS to obtain a college scholarship; (b) Significantly more likely to take AAS even if it had a 50% chance of killing them in 20-30 years; and, (c) Significantly more likely to take AAS to obtain a

professional contract. The authors suggest that the American Medical Association Council on Scientific Affairs' teaching strategies for combating AAS-use may be inadequate and propose that "more in-depth exposure to the risks and complications of anabolic agents to alter the attitudes of adolescents" (p. 213). While these recommendations may be helpful, the reasons for the ineffectiveness of such programs lies with improper assumptions of the program, reductionistic tactics comprising the program, and a failure to address participants' goals for physique improvement.

Goldberg et al.'s (1990) program was based upon one assumption that individuals' most vulnerable to AAS-use know very little about these drugs. This assumption lies in direct contrast to Chng and Moore's (1990) study which showed that AAS-Users know significantly more about the negative side effects and ergogenic effects of AAS than AAS-nonusers (although AAS-nonusers also had some knowledge of AAS's effects). In fact, in Olrich's (1990) study, many of the AAS-Users were very educated individuals with advanced degrees who learned about AAS from friends and pertinent literature before initiating their use. A second improper assumption of the program was that educating participants' on the negative physiological side effects of AAS would scare them away from the drugs. While some studies have shown that fear appeals may have limited success in changing attitudes and behavior (e.g., Beck, 1984; Stainback & Rogers, 1983), other studies have revealed that fear appeals fail to change attitudes in general (e.g., Janis & Feshbach, 1953; Witte, 1992) and about drugs in particular (Baker, Petty, & Gleicher, 1991; Green & Kelley, 1989), and may even undermine a communication's persuasiveness (Janis, 1967; McGuire, 1969). According to Rogers (1983), communications based solely on

fear often fail when such appeals do not elicit high levels of fear and do not provide the targeted individuals with the response efficacy and self-efficacy needed to change their behavior. Fear appeals that lack these two components often result in individuals enacting defensive measures (such as denial) and making maladaptive changes (continued drug use). Conversely, fear appeals that contain these two components stimulate in participants' protective measures (attention to the message) and adaptive changes (cessation of drug use). Thus, anti-AAS programs need to be sufficiently threatening and provide response and self-efficacy eliciting information to help participants quit using AAS.

Providing sufficient threat in an AAS program demands an understanding of the social psychological literature on the elicitation of fear. According to Rogers' (1983) protection motivation theory, constructive fear appeals need to contain two appraisal processes in order for individuals to attend to the message: judgment of the severity of the depicted threat (e.g., health problems sustained from taking AAS) and judgment of one's vulnerability or susceptibility to the threat. It is thought that such elicitations of fear may motivate participants to attend to and systematically or heuristically process subsequent information aimed at enhancing participants' response and self-efficacy to cease their maladaptive behavior (Schwarz, 1990). Information presented to increase participants' beliefs that they should and are able to cease AAS should directly follow the fear arousing information (Rogers, 1983). The problem is, of course, determining exactly what types of information should be used to increase participants' self-efficacy. Getting AAS-Users to believe that they can cease AAS-use may be very difficult because of these drugs' organically-routed

physiological and psychological dependency (Brower, 1991, 1992b) and due to these drugs' positive reinforcement of participants' body-image (and hence, self-esteem) goals. Past AAS-intervention strategies have not taken these two areas into account, perhaps causing their ineffectiveness in detering AAS-use. For example, an educational program whose perceived aim is to prevent individuals from desparately acquiring the muscle mass and strength gains they desire is certainly bound to be ineffective. Therefore, in order to erect a better AAS prevention/intervention program, one of the first things educators and psychologists need to understand is participants' need to improve their body image and/or athletic performance.

As a result of the discriminant and path analyses, it is apparent that any program designed to combat AAS-use must address individuals' body image concerns, attitudes toward AAS, relationships with significant others (paying particular attention to the father), and job competence issues (or competence concerns that are central to the age of the participants). These issues may be central to the psychological dependence that several researchers have noted concerning AAS-use (e.g., Brower, 1989, 1991, 1992b; Goldman & Klatz, 1992; Olrich, 1990; Taylor, 1985). This psychological dependence is so strong, that many AAS-Users have stated that they would continue taking these drugs even if: (a) They were convinced their fellow competitors were no longer using them; (b) It was proven beyond a doubt that they would lead to permanent sterility; (c) It was proven beyond a doubt that it would increase the risk of liver cancer; (d) It was proven beyond a doubt that it would influence the risk of heart attack (Yesalis et al, 1989); (e) It had a 50% chance of killing them in 20 - 30 years (Goldberg et al., 1990); (f) The drug would guarantee a victory in all athletic

competitions including professional yet it would kill them in 5 years (Goldman & Klatz, 1992). In addition, males who have been taking AAS may begin to perceive AAS as central to their identity similar to the way that Woodall, DiDomenico, and Andersen (1990) found in chronic anorexia nervosa patients. These individuals can come to fear a life apart from AAS, becoming "professional" AAS-Users. Thus, a central concern to AAS prevention and intervention programs is to reduce the psychological and potential physiological dependence (e.g., Brower, 1991, 1992b) of AAS on AAS-Users and to prevent such exacerbated conditions on AAS-Contemplators. As already illustrated, such a program cannot rely simply on scare tactics and a "Just Say No" itinerary as such programs fail to address AAS-involved individuals' intrapsychic needs and desires. Rather, AAS-intervention and prevention programs need to utlize a multidimensional approach comprised of AAS-education, counseling, and weighlifting education.

Recommendations

AAS-intervention recommendations. Because AAS-Users have been shown to desire very high levels of muscle mass (possibly Body Dysmorphic Disorder) which is exacerbated by peers and the context of their gym, may have relationship problems with significant others, and feelings of job inadequacy, programs designed to stop individuals from using AAS need to be multifaceted. The following are recommendations for such programs.

1. Psychological counseling and medical exams. Counseling is an important facet of any AAS-intervention program. Without it, the program is likely to be inefficacious and possibly only exacerbate individuals' AAS-use. Participants entering AAS-intervention programs may be doing so unwillingly.

Perhaps they are forced by a court order, significant other, employer, etc. As such, these individuals may be very adversive to change because the musculature resulting from AAS is central in participants' psychological dependence to these drugs. One theory which has been shown to be highly effective in dealing with such individuals, with health problems in general, and with addictive behaviors (such as various types of drug use) in particular, is the Transtheoretical Model (Prochaska & DiClemente, 1984). Using this eclectic model, therapists can scrutinize individuals in terms of their readiness for change and act accordingly. Just as this study has shown AAS-Users' intrapsychic, potential relationship, and situational problems are central to their AAS-use, The Transtheoretical Model deals with all of these levels of change issues: Symptom/situational, maladaptive cognitions, current interpersonal conflicts, family/systems conflicts, and intrapersonal conflicts (Prochaska & DiClemente, 1984). In therapy, participants' should be screened for Body Dysmorphic (American Psychiatric Association, 1994) whose characteristics are stated below:

a. Preoccupation with an imagined defect in appearance. If a slight physical anomaly is present, the person's concern is markedly different.

b. The preoccupation causes clinically significant distress or impairment in social, occupational, or other important areas of functioning.

c. The preoccupation is not better accounted for by another mental disorder (e.g., dissatisfaction with body shape and size in Anorexia Nervosa).

If dependent AAS-Users are thought to possess "reverse anorexia nervosa" (Pope & Katz, 1988), clinicians should use a modified diagnostic criteria for anorexia nervosa to examine the extent of this disorder (or perhaps a

new "reverse anorexia nervosa" category needs to be added to the DSM-IV). In any event, the counselor(s) selected to initiate therapy or group therapy (e.g., Corcoran & Longo, 1992) with these individuals should possess some knowledge of weightlifting and AAS and be able to discriminate between most males' healthy desire to gain muscle mass and AAS-Users' need to gain extensive muscle mass.

Another issue that therapists need to consider when intervening with AAS-use is steering AAS-Users away from social comparison and getting them focused on task mastery. While it would seem that AAS-Users are already focused on improving their weights and adding inches to their bodies relative to their current statuses, this study has shown that peer and contextual pressure to add muscle mass significantly contributes to individuals' desire to use AAS. That would indicate that AAS-Users and AAS-Contemplators rely heavily on social comparison when examining their bodies and weightlifting performance, as opposed to AAS-Noncontemplators. As such, it may be necessary to get recovering AAS-Users to train at a different gym in order to break away from peer pressure, contextual pressure, and the ease of obtaining AAS. It would be beneficial if these recovering AAS-Users could make friends with and train with staunch AAS-Noncontemplators who are serious weightlifters. These individuals could serve as drug-free role models who provide pertinent weightlifting and dietary information to the recovering AAS-user about "natural" weightlifting thereby raising AAS-Users' self-efficacy that they are able to train drug-free. Such modeling and verbal reinforcement are cornerstones of self-efficacy theory (Bandura, 1986). In addition, AAS-Users and AAS-

Contemplators should also undergo peer resistance training in order to combat peer and contextual pressures to use AAS.

Based on the causal impact of job competence on attitudes towards repeated use of AAS, AAS-Users' may need career counseling. As already discussed, feelings of job inadequacy may stem from AAS-Users' decision to work at underachieving jobs which allow them a flexible schedule and the time needed to concentrate on intense weightlifting. This may also be a result of a lack of education, which some researchers have found to be a characteristic of AAS-Users (e.g., Kersey, 1993). In any event, career counseling appears to be a necessary component of AAS-intervention programs.

Another component of therapy for recovering AAS-Users concerns AAS's possible physiological dependence (Brower, 1992b; Brower et al., 1990). Brower has found that, based on DSM-III-R criteria, many AAS-Users can be classified for psychoactive and physical drug dependence as they have indicated withdrawal symptoms including fatigue, depressed mood, restlessness, anorexia, insomnia, and decreased libido (Brower et al., 1991; Brower, 1992a). In addition, many AAS-Users' also felt a desire to take more AAS, dissatisfaction with body image, and, to a lesser extent, suicidal thougts after ceasing AAS use (Brower et al., 1991; Tennant, Black, & Voy, 1988). Brower has also noted that some AAS-Users have been known to self-medicate with AAS to combat depression (Brower, 1992a). Such physiological addiction may result from the plethora of anabolic-androgenic agents that are normally ingested or injected together at incredibly high doses (sometimes 1000 times the recommended medical dose - Corcoran & Longo, 1992) and because

higher doses and different drugs are needed over time to combat physiological habituation (Goldman & Klatz, 1992).

Because of this physiological addiction, inpatient treatment may be necessary so that detoxification and professional monitoring for suicide can be undertaken (Brower, 1989; Corcoran & Longo, 1992). It is important to pay special attention to urine screening for AAS as there are various drugs and techniques that can be used to escape detection (DiPasquale, 1984; Goldman & Klatz, 1992). In addition, medical exams should be performed in order to monitor the extent of potential physiological and psychological damage done to AAS-Users during their time of AAS-use and possibly concurrent general drug use (e.g., Corcoran & Longo, 1992; Pope & Katz, 1988).

2. AAS-education programs. Such programs need to be presented by individuals who are preceived to be credible sources of information on AAS and weightlifting, as source credibility has been shown to be crucial to persuasive appeals (Chaiken, 1987; Petty & Cacioppo, 1986; Wu & Shaffer, 1987). That is, these educators/counselors should be not only well-versed in this subject matter, but also should appear physically fit and look as though they possess a weightlfiting history. However, it has been suggested that therapists who are extemely muscular may provide "grist for the mill" for AAS-Users, possibly provoking recovering AAS-Users to continue consumption of these drugs (Corcoran & Longo, 1992). As such, intense transference issues should be handled in the counseling session of the intervention program.

The program, itself, should contain the positive and negative aspects of AAS-use. Programs failing to address the dynamic ergogenic and recuperative effects of AAS, which have been experienced by these participants, may only

heighten the distrust of AAS-Users' on this educational program, turning off participants' attention and processing of the programs' messages (Wartella & Middlestadt, 1991).

In elevating participants' self-efficacy to cease their AAS-use, several factors must be taken into consideration: Body image concerns and peer and contextual pressure to use AAS. As shown in this study, AAS-Users have a great desire to add a large amount of muscle mass to their already muscular bodies. Simply telling participants that they should not be using AAS does not address this need. In the educational part of an intervention program, these needs should be addressed. It should be explained to the AAS-Users that they will lose significant amounts of size, strength, training intensity, and recuperative abilities. However, these losses can be minimized if these individuals are educated on scientific training principles, nutritional principles geared towards enhancing muscle mass, the nutritional supplements, and recuperative needs of the body. Once again, if this program is lead by perceived credible sources, participants' self-efficacy in ceasing AAS-use and exploring these new areas becomes elevated. If participants' self-efficacy remains low when the perceived threat of AAS remains high, they may initiate denial of AAS's danger to them, continue using these drugs, and simply apply these new facts to their training routine. Thus, a nutritionist who deals with high performance weightlifters may be necessary to this program.

AAS-Prevention Program Recommendations

Preventing males from using AAS requires a strong, empirically-based approach. As already discussed, drug prevention programs relying solely on educational fear appeals are often inefficacious and may even stimulate

participants' desires to use the targetted drugs (e.g., Goldberg et al., 1990; Goodstadt, 1980; Swisher, Crawford, Goldstein & Yura, 1971). Thus, the first consideration that any AAS-prevention program must make is the target population of their program. The second consideration should be developing ways of dissauding this target population from using AAS, using a multifaceted approach. Educators of this program should also be cognizant of the DSM-IV criteria for Body Dysmorphic Disorder in order to detect individuals' most vulnerable to use AAS and be knowledgeable of the empirical means of increasing body size and strength.

AAS-prevention program target population. It is apparent from the many research studies on the incidence of AAS, that AAS-use begins at a very young age. For example, Buckley et al. (1988), who surveyed 3403 twelfth-grade males in 46 private and public high schools across the United States, found that of the 226 adolescents who reported AAS-use, 38% reported having used AAS first at age 15 or younger and another 33% reported having used AAS first at age 16. That there has been estimated to be around 1 million adolescent AAS-Users in the United States (Buckley et al., 1988; Marshall, 1988) is especially worrisome given the findings of some researchers that the earlier individuals start AAS-use, the more likely they will become "hardcore" users of these drugs in the future (Yesalis et al., 1989) and users of the cheapest and most toxic forms of AAS (Yonker et al., 1990). Also, prevention programs should be directed at athletes whose sport demands large amounts of power and strength, since they have shown the highest frequency of use (Duda, 1985), at weightlifters who intend on competing in bodybuilding, powerlifting, and Olympic Weightlifting events, and also, as has been suggested by Olrich (1990)

and shown in this study, at weightlifters who have been cast aside from organized sports because of their ectomorphic somatotype.

Another crucial ingredient of any prevention program is educating parents, teachers, and coaches of AAS' negative physiological and psychological side effects as well as the psychosocial, situational, and weightlifting-related variables characteristic of males' contemplating or using AAS. Early detection of body image problems, self-esteem concerns, peer and contextual pressure to gain muscle mass, weightlifting satisfaction, availability of AAS and their illicit anabolic cousins, and attitudes towards these drugs and other illicit means of improving athletic performance and/or body size are crucial to any AAS-prevention programs. Individuals thought to be highly vulnerable to first time AAS-use can be directed towards the type of counseling mentioned in the intervention program section above in addition to the educational part of the program.

The educational part of the prevention program should cover the same topics as discussed in the intervention program: The physiological and psychological side effects of the drugs, empirical means of gaining size and strength through proper sports nutrition, recuperation, peer pressure resistance training and weightlifting training principles. The legal implications of AAS-use should also be discussed. Individuals need to understand that AAS possession and trafficking are now considered by law to be in the same category as amphetamine and opium use, which is punishable by up to five years in prison and fines of $250,000 (cited in Sherman, 1992). Coaches need to emphasize and re-emphasize a compassionate policy, in which any drug use is not tolerated, but that individuals seeking help will be given help and will not

necessarily be thrown off of the team (unless they are drug-trafficking, for example). Common perceptions of AAS-Users concerning AAS-use being an individual choice which harms nobody but the user needs to be addressed also such that individuals understand how society is negatively affected by individuals' desire to use AAS (in terms of morality, insurance costs, city taxes for narcotic officers, drug rehabilitation, etc.).

In sum, AAS-prevention/intervention programs need to include the following items in order to increase their effectiveness:

1. Improving participants' perceived body image and/or athletic performance.
2. The utilization of an anti-AAS education program, lead by knowledgeable and fit-looking individuals, which contains both highly threatening fear appeals to dissuade participants from using AAS as well as material which increases participants' sense of efficacy to refrain from AAS use. Such a program should also reveal AAS' positive ergogenic and restorative effects.
3. Empirical weightlifting, nutritional, and recuperative strategies that participants' can use to improve upon their natural weightlifting results.
4. The removal of AAS-Contemplators from gyms known to have many AAS-Users.
5. Job/career counseling.
6. Peer resistance training.
7. Counseling that pays special attention to the father-son relationship.
8. Educating parents, teachers, and coaches of the physiological and psychological, and behavioral signs of AAS-use.

Recommendations For Future Research

Future research needs to further address the psychosocial, situational, and weightlifting-related variables that influence AAS-intention and AAS-use. For example, scales at understanding individuals' level of morality, SES, need to feel safe, risk-taking propensity, and satisfaction with mother, father, and significant other relationships appear to be quite worthy of consideration given general drug abuse research and this study. Another interesting variable which could be examined in future AAS-related studies is whether AAS-Users and/or AAS-Contemplators tend to be early or late maturers. Perhaps early maturers initiate AAS in order to stay competitive with later maturers (who often grow to be bigger than early maturers) or late maturers begin using AAS in order to compete with early maturers. Variables should also be studied which may protect individuals from AAS use, similar to the ones found in general drug abuse research (e.g., Newcomb & Felix-Ortiz, 1992). In this and other studies on marijuana, alcohol, and cocaine abuse, researchers have found that high religiosity, grade point average, self-acceptance, and home relationships (among other variables) may protect individuals from using these drugs. Perhaps the best way in which to select potential protective factor variables to use in future AAS-research is via more qualitative work in this area. Such protective factors, in addition to this studies' findings, may provide a better understanding of the differences between AAS-Users, AAS-Contemplators, and AAS-Noncontemplators.

Besides protective factors, future research should consider investigating male, AAS-Users' relationships with their fathers. Given Andersen's (1992)

suggestion that poor father-son relationships may result in male eating disorders, it is possible that AAS-Users are using these drugs to avoid any similarity to a frail, thin, meek, or somehow "unmasculine" father. Or, perhaps, these drugs are taken to become bigger and stronger than an overbearing father. Lastly, while this study has already focused on the psychosocial, situational, and weightlifting-related needs of the AAS-Contemplators and AAS-Users, perhaps more knowledge of AAS-use can be gained from analyzing the variables associated with a large sample of AAS-Users who have discontinued their use. Analyzing the discontinuation of AAS-use in terms of the suggested protective factors and as well as vulnerability factors found in this study would provide educators, therapists, coaches, and parents with the ability to build a stronger environment that protects against anabolic-androgenic steroids.

Researchers need to further target cognitive differences between AAS-Contemplators, AAS-Noncontemplators, and AAS-Users in terms of their attitudes of AAS and intentions to use AAS. The examination of the processes leading to AAS-intention and why such changes in cognition and behavior occur in some weightlifters and not others (who are matched on weightlifting motivation) should be central to future research on AAS-use.

In terms of methodology, future research should attempt to use a rigorous sampling strategy in which groups are matched on variables which may impact questionnaire responses, such as on age, educational background, and gender. In addition, in order to ensure proper responses to girth measurements, future research should provide participants with instructions on how to measure the size of their arms, legs, and chest with a tape measure. Such instructions should include information on where to measure the desired

muscle (e.g., the muscle belly) and when to measure it (e.g., after an exercise when pumped up or without any exercise when "cold"). Future researchers should also consider studying the effects of the psychosocial, situational, physical, and weightlifting related variables on AAS-use longitudinally, as there has been no research to indicate whether these variables are static or dynamic over time. That is, perhaps these variables change over time due to situational events (such as training plateaus) and if so, then understanding the cause of these variable changes would be a very fruitful topical area.

APPENDICES

APPENDIX A

HUMAN SUBJECTS APPROVAL FORM

APPENDIX A

HUMAN SUBJECTS APPROVAL FORM

MICHIGAN STATE
UNIVERSITY

November 13, 1996

TO: Steven G. Simensky
38 IM Circle

FR: David E. Wright, Ph.D.
Chair
The University Committee on Research
Involving Human Subjects (UCRIHS)
232 Administration Building

RE: IRB#: 94-264
TITLE: AN INVESTIGATION OF THE PSYCHOSOCIAL VARIABLES AND SITUATIONAL CONTEXTS WHICH MAY PREDISPOSE WEIGHTLIFTERS TO INITIATE ANABOLIC-ANDROGENIC STEROID CONSUMPTION
CATEGORY: 1-C
APPROVAL DATE: 12/04/95

RENEWAL: Our records indicate that this project was approved on the date shown above. As you know, UCRIHS approval is valid for one calendar year. If you are planning to continue your study after December 4, 1996, you must complete and return to the UCRIHS office a green renewal application form by November 4, 1996. There is a maximum of four such expedited renewals possible. Investigators wishing to continue a project beyond that time need to submit it again for complete review.

CHANGES: As you are aware, UCRIHS must review and approve all revisions to human subjects activities, prior to initiation of the change. Therefore, if you have any future study revisions you wish UCRIHS to review and approve at this time, please answer question #7 on the renewal form "no" and follow the instructions given there.

If you have decided to discontinue the research or if you have already submitted your application to renew this study, please disregard this reminder.

cc: Martha E. Ewing

OFFICE OF
RESEARCH
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STUDIES

University Committee on
Research Involving
Human Subjects
(UCRIHS)

Michigan State University
232 Administration Building
East Lansing, Michigan
48824-1046

517/355-2180
FAX: 517/432-1171

APPENDIX B

STEROID VARIABLES QUESTIONNAIRE

APPENDIX B

STEROID VARIABLES QUESTIONNAIRE

1. Steroid Attitude Subscale (SAQ)

	Strongly Disagree	Disagree	Neither	Agree	Strongly Agree
1. I think steroids should be legalized.	1	2	3	4	5
2. Steroids have received a lot of unfair negative press	1	2	3	4	5
3. I believe people should be able to use steroids if they wish to do so	1	2	3	4	5
4. I believe steroids should not be involved in any sports or physique contests	1	2	3	4	5
5. I believe steroids are very dangerous.	1	2	3	4	5
6. I think that steroids can safely add muscle mass and strength	1	2	3	4	5
7. I believe that the controlled use of steroids is OK for adults and professional athletes	1	2	3	4	5
8. Steroids aren't that bad, as long as you know how to use them	1	2	3	4	5

2. AAS-Availability Subscale

	Strongly Disagree	Disagree	Neither	Agree	Strongly Agree
1. If I wanted to use steroids, I would have no clue on how to get them	1	2	3	4	5
2. I know some people who could supply me with steroids if I wanted them	1	2	3	4	5
3. If I really wanted to use steroids, I could probably find them	1	2	3	4	5

3. Weightlifing Dissatisfaction Subscale

	Strongly Disagree	Disagree	Neither	Agree	Strongly Agree
1. My weight training right now is not going anywhere	1	2	3	4	5
2. My strength levels have gone up pretty rapidly lately	1	2	3	4	5
3. I can't seem to put on muscle mass no matter what I do	1	2	3	4	5

4. Social Context of the Gym Subscale

	Strongly Disagree	Disagree	Neither	Agree	Strongly Agree
1. In the gym I train at, there are a lot of weightlifters who are bigger and stronger than me	1	2	3	4	5
2. Just looking at some of the bigger guys in the gym motivates me to get huge.	1	2	3	4	5

3. In my gym, the training atmosphere is usually pretty intense	1	2	3	4	5
4. Sometimes I feel intimidated by the size and strength of some of the guys in my gym	1	2	3	4	5

5. Peer Pressure Subscale

	Strongly Disagree	Disagree	Neither	Agree	Strongly Agree
1. Sometimes in the gym, people joke with me that I'm small	1	2	3	4	5
2. I wish I were as strong as some of my weight training friends	1	2	3	4	5

6. AAS-Intention Subscale

	Strongly Disagree	Disagree	Neither	Agree	Strongly Agree
1. I do not intend on using steroids	1	2	3	4	5
2. I am currently planning on trying steroids	1	2	3	4	5
3. I have seriously contemplated using steroids	1	2	3	4	5
4. I may try steroids some time in the future	1	2	3	4	5

7. Listen Subscale

	Strongly Disagree	Disagree	Neither	Agree	Strongly Agree
1. I'm not concerned with how my weight training friends feel concerning my decision to use or not use steroids	1	2	3	4	5
2. It's important to me what the guys in the gym think about my decision to use or not use steroids	1	2	3	4	5
3. I would listen and act according to what my parents have to say about whether to use or not use steroids	1	2	3	4	5
4. No matter what my relationship partner has to say about steroids, I'll decide for myself whether to use or not use	1	2	3	4	5

8. Approval Subscale

	Strongly Disagree	Disagree	Neither	Agree	Strongly Agree
1. Using steroids would earn the respect of some of my weight training friends	1	2	3	4	5
2. My parents would approve of me using steroids	1	2	3	4	5
3. Most of the guys in the gym would disapprove of me using steroids	1	2	3	4	5
4. My relationship partner would be pleased if I used steroids	1	2	3	4	5

APPENDIX C

SCALES' PSYCHOMETRIC PROPERTIES AND PILOT TESTING RESULTS

APPENDIX C

PSYCHOMETRIC PROPERTIES OF QUESTIONNAIRES

1. Steroid Variables Questionnaire

Factor Subscale	Cronbach's Alpha
Steroid Attitude	.82
AAS-Intention	.83
Peer	.61
Social Context	.61
Weightlifting Dissatisfaction	.67
Listen	.85
Approval	.79
AAS-Availability	.75

2. Multidimensional Body-Self Relations Questionnaire [cited in Cash (1984)]

		Norms	
Factor Subscale	Cronbach's Alpha	Mean	S.D.
Appearance Evaluation	.88	3.49	.83
Body-Areas Satisfaction	.77	3.50	.63
Overweight Preoccupation	.73	2.47	
Self-Classified Weight	.70	2.96	.62

Note. Norms were established based on 996 males.

3. Perceived Competence Measures For Adolescents [cited in Harter (1986)]

		Norms	
Factor Subscale	Cronbach's Alpha	Mean	S.D.
Cognitive Competency	.86	3.28	.65
Job Competency	.76	3.33	.56
Athletic Competency	.92	3.00	.82
Social Competency	.80	3.16	.58
Physique Competency	.85	2.88	.58
Global Self-Worth	not given	3.25	.51

Note. Norms were based on 70 males, university students.

APPENDIX D

CONSENT FORM

APPENDIX D

CONSENT FORM

This study is being conducted by Steven G. Simensky, M.A., currently a doctoral student in the Department of Physical Education and Exercise Science at Michigan State University in partial fulfillment of the requirements for the degree of Ph.D. The purpose of this nationwide survey is to assess some psychological factors which are associated with weight training. Because the survey contains around170 questions and should take 55 to 65 minutes to complete, feel free to take a break at any time. Also, because this survey is fairly lengthy, please do not feel obligated to complete it at one sitting. When you have completed the entire survey, please mail it directly back to Steven G. Simensky using the stamped envelope which is enclosed.

I understand that the information I report in this survey will be anonymous and held in the strictest of confidence. There will be no identifying information of the questionnaire - **DO NOT PUT YOUR NAME, ADDRESS, OR GYM NAME ANYWHERE ON THIS BOOKLET OR ENVELOPE.** I further understand that I may choose not to answer any question and discontinue my participation at any time without loss or penalty. If I have any questions about this study or its results, I may contact Steven Simensky, Department of Physical Education and Exercise Science, (517-332-1730) for more information.

The project has been reviewed and approved by the University Committee on Research Involving Human Subjects (UCRIHS) at Michigan State University.

I have read the material above and any questions I have asked have been answered to my satisfaction. You indicate your voluntary agreement to participate by completing and returning this questionnaire.

Instructions

The following pages contain a series of statements about how people think, feel, or behave. You are asked to indicate the extent to which you agree or disagree with each statement.

It is conceivable that you may feel that some of the questions contained within are silly or irrelevant, but please complete these and all other questions to the best of your ability. Also, because each and every survey is very crucial to this study, please do not throw it away or fail to send it back to the author (a self-addressed stamped envelope is enclosed). Thank you. Your help in this study is greatly appreciated!

There are no right or wrong answers to any of the items on any of the questionnaires. Just give the answer that is most accurate for you. Remember, your responses are anonymous and confidential, so please be completely honest. Please give an answer to all of the items.

APPENDIX E

GENERAL QUESTIONNAIRE, PHYSIQUE, AND WEIGHTLIFTING SCALES

APPENDIX E

GENERAL, PHYSIQUE, AND WEIGHTLIFTING QUESTIONNAIRES

If you have never or very rarely weightlifted before, skip the questions pertaining to weightlifting and answer all other questions.

General Questions

1. Age: _____years old
2. How much do you currently weigh?: _____ pounds
3. How tall are you: _____feet _____inches
4. In what state do you currently reside? _____

Physique Questions

Please skip any question(s) which you do not know and cannot offer an educated guess.

5. What is your best estimate of your current body fat percentage: _____ %
6. What is your best estimate of the circumference of the following body parts, measured at the largest point of the body part?

a. Arms: _____ inches b. Legs _____inches c. Chest _____inches d. Waist _____inches

7. What would you like the circumference of the following body parts to be?

a. Arms: _____ inches b. Legs _____inches c. Chest _____inches d. Waist _____inches

Weightlifting Questions

8. Before you started serious weightlifting, how much did you weigh? _____ pounds
9. How long have you been weightlifting? ____years ____months
10. Please estimate how many hours **each week** you currently spend weightlifting on the average? _____ hours per week
11. What is the most you have lifted or think you could have lifted for one repetition in the past month? Estimate if necessary.

    Bench Press: _____ pounds Squat: _____ pounds Leg Press: _____ pounds
12. What is the most you have ever lifted for one repetition? Estimate if necessary.

    Bench Press: _____ pounds Squat: _____pounds Leg Press: _____ pounds
13. Have you ever competed in a bodybuilding, powerlifting, or Olympic lifting contest? Yes____ No_____
14. Do you plan on ever entering any of contests listed in the last question? Yes ____ No _____

APPENDIX F

HARTER'S PERCEIVED COMPETENCE FOR ADOLESCENTS QUESTIONNAIRE

APPENDIX F

HARTER'S PERCEIVED COMPETENCE QUESTIONNAIRE

Directions: In each question there are two statements. You are asked to circle only one number per question which represents the statement you feel is more important to you. Notice the following example:

	Really True for Me	Sort of True for Me			Sort of True for Me	Really True for Me
1.	1	2	Some guys like to go to the movies in their spare time	**BUT** Other guys would rather go to sports events	3	4

In this example, the individual decided that of the two statements, the second one was very much more like him. REMEMBER, please circle **ONLY ONE** number per question.

How important are each of these things to you?

	Really True for Me	Sort of True for Me			Sort of True for Me	Really True for Me
1.	1	2	Some guys feel that they are just as smart as others their age.	**BUT** Other guys aren't so sure and wonder if they are as smart	3	4
2.	1	2	Some guys feel that they are pretty intelligent	**BUT** Other guys question whether they are intelligent	3	4
3.	1	2	Some guys are/were pretty slow in finishing their school work	**BUT** Other guys can/could do their school work more quickly	3	4
4.	1	2	Some guys do/did well at their classwork	**BUT** Other guys didn't/don't do very well at their classwork	3	4
5.	1	2	Some guys have/had trouble figuring out the answers in school	**BUT** Other guys almost always can/could figure out the answers	3	4
6.	1	2	Some guys find it hard to make friends	**BUT** For other guys it's pretty easy	3	4
7.	1	2	Some guys have alot of friends	**BUT** Other guys don't have very many friends	3	4
8.	1	2	Some guys are kind of hard to like	**BUT** Other guys are really easy to like	3	4
9.	1	2	Some guys are popular with others	**BUT** Other guys are not very popular	3	4
10.	1	2	Some guys feel that they are socially accepted	**BUT** Other guys wished that more people accepted them	3	4
11.	1	2	Some guys do/did very well at all kinds of sports	**BUT** Other guys don't feel that they are/were very good when it comes to sports	3	4

Really True for Me	Sort of True for Me			Sort of True for Me	Really True for Me
12. 1	2	Some guys think they could do well at just about any new athletic activity	**BUT**	Other guys are afraid they might not do well at a new athletic activity	3 4
13. 1	2	Some guys feel that they are better than others at sports	**BUT**	Other guys don't feel they can play as well	3 4
14. 1	2	Some guys don't do well at new outdoor games	**BUT**	Other guys are good at new games right away	3 4
15. 1	2	Some guys do not feel that they are very athletic	**BUT**	Other guys feel that they <u>are</u> very athletic	3 4
16. 1	2	Some guys are <u>not</u> happy with the way they look	**BUT**	Other guys <u>are</u> happy with the way they look	3 4
17. 1	2	Some guys wish their body was different	**BUT**	Other guys like their body the way it is.	3 4
18. 1	2	Some guys wish their physical appearance was different	**BUT**	Other guys like their physical appearance the way it is	3 4
19. 1	2	Some guys think that they are good looking	**BUT**	Other guys think they are not very good looking	3 4
20. 1	2	Some guys really like their looks	**BUT**	Other guys wish they looked different	3 4
21. 1	2	Some guys feel that they are ready to do well at a job	**BUT**	Other guys feel that they are not quite ready to handle a job	3 4
22. 1	2	Some guys feel that they <u>don't</u> have enough skills to do well at a job	**BUT**	Other guys feel that they <u>do</u> have enough skills to do a job well	3 4
23. 1	2	Some guys feel like they could do better at work they do for pay	**BUT**	Other guys feel that they are doing really well at work they do for pay	3 4
24. 1	2	Some guys feel that they are really able to handle the work on a paying job	**BUT**	Other guys wonder if they are really doing as good a job at work as they should be doing	3 4
25. 1	2	Some guys are often disappointed with themselves	**BUT**	Other guys are pretty pleased with themselves	3 4
26. 1	2	Some guys don't like the way they are leading their life	**BUT**	Other guys do like the way they are leading their life	3 4
27. 1	2	Some guys are happy with themselves most of the time	**BUT**	Other guys are often not happy with themselves	3 4
28. 1	2	Some guys like the kind of person they are	**BUT**	Other guys often wish they were someone else	3 4
29. 1	2	Some guys are very happy being the way they are	**BUT**	Other guys wish they were different	3 4

APPENDIX G

MULTI-DIMENSIONAL BODY-SELF RELATIONS QUESTIONNAIRE

APPENDIX G

MULTIDIMENSIONAL BODY-SELF RELATIONS QUESTIONNAIRE

The following pages contain a series of statements about how people think, feel, or behave. You are asked to indicate the extent to which each statement pertains to you personally.

Your answers to the items in the questionnaire are anonymous, so please do not write your name on any of the materials. In order to complete the questionnaire, read each statement carefully and decide how much it pertains to you personally.

There are no right or wrong answers. Just give the answer that is most accurate for you. Remember, your responses are anonymous, so please be completely honest. Please give an answer to all of the items. Check from time to time to make sure you are circling the correct number for the current question.

	Definitely Disagree	Mostly Disagree	Neither	Mostly Agree	Definitely Agree
Example: I am in a good mood.....	1	2	3	4	5

	Definitely Disagree	Mostly Disagree	Neither	Mostly Agree	Definitely Agree
1. My body is sexually appealing.....	1	2	3	4	5
2. I am not involved in a regular exercise program.....	1	2	3	4	5
3. I am in control of my health.....	1	2	3	4	5
4. I know a lot about things that affect my physical health...	1	2	3	4	5
5. I have deliberately developed a healthy lifestyle.....	1	2	3	4	5
6. I constantly worry about being or becoming small.....	1	2	3	4	5
7. I like my looks just the way they are.....	1	2	3	4	5
8. I am very conscious of even small changes in my weight.	1	2	3	4	5
9. Most people would consider me good-looking.....	1	2	3	4	5
10. I like the way I look without my clothes.....	1	2	3	4	5
11. I like the way my clothes fit me.....	1	2	3	4	5
12. I dislike my physique.....	1	2	3	4	5
13. I am physically unattractive.....	1	2	3	4	5
14. I am on a weight-gain diet.....	1	2	3	4	5

Directions: For the next items use the response scale given with the item, and circle one answer below each statement.

15. I have tried to lose weight by fasting or going on crash diets:

    1. Never 2. Rarely 3. Sometimes 4. Often 5. Very Often

16. I think I am:

    1. Very Underweight 2. Somewhat Underweight 3. Normal Weight
    4. Somewhat Overweight 5. Very Overweight

17. From looking at me, most other people would think I am:

1. Very Underweight 2. Somewhat Underweight 3. Normal Weight
4. Somewhat Overweight 5. Very Overweight

18. I have tried to gain weight by consuming vast amounts of food or supplements:

1. Never 2. Rarely 3. Sometimes 4. Often 5. Very Often

19. I think I am:

1. Very Thin 2. Somewhat Thin 3. Average Size
4. Somewhat Muscular 5. Very Muscular 6. Overweight

20. From looking at me, most other people would think I am:

1. Very Thin 2. Somewhat Thin 3. Average Size
4. Somewhat Muscular 5. Very Muscular 6. Overweight

For the remaining questions, indicate how satisfied you are with each of the following areas of your body using the the following scale.

	Very Dissatisfied	Mostly Dissatisfied	Neither	Mostly Satisfied	Very Satisfied
21. Face (facial features, complexion)	1	2	3	4	5
22. Hair (color, thickness, texture)	1	2	3	4	5
23. Lower torso (buttocks, hips, thighs, legs)	1	2	3	4	5
24. Mid torso (waist, stomach)	1	2	3	4	5
25. Upper torso (chest, shoulders, arms)	1	2	3	4	5
26. Muscle tone	1	2	3	4	5
27. Weight	1	2	3	4	5
28. Height	1	2	3	4	5
29. Overall appearance	1	2	3	4	5

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