UNDERSTANDING THE MOTIVATION TO USE ANABOLIC STEROIDS:
AN APPLICATION OF THE THEORY OF REASONED ACTION
by
Daniel I. Galper

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Richard A. Winett, Ph.D., Committee Chairman


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Committee Chair, Richard A. Winett, Ph.D.
Department of Psychology

ABSTRACT

The nonmedical use of anabolic-androgenic steroids (AAS) is an emerging public health concern. Despite a recent call for AAS prevention by the National Institute on Drug Abuse (Lin & Erinoff, 1990), little theory-based research has been conducted on the etiology of AAS use. In the present study, the Theory of Reasoned Action (TRA) was used as a model for understanding and explaining the psychosocial factors which motivate weightlifters to use AAS.

One-Hundred-three male weightlifters (mean age = 23.3 years, range 18-39) completed a survey that assessed past drug use (including past AAS use) and constructs relevant to the TRA: attitudes about personal AAS use, subjective norms regarding personal AAS use, and intentions to use AAS over the next year. In addition, perceived behavioral control was assessed and the TRA was compared to the Theory of Planned Behavior (TPB).

Overall, seventeen (16.5%) of participants reported the past use of AAS and nine (8.7%) reported the intention to use AAS at sometime over the next
year. Multiple regression (MR) analyses revealed that respondents' attitudes (Beta = .72, p < .001) towards personal AAS use significantly predicted AAS intentions and explained 55% of the variability in the intention to use AAS (i.e., R² = .55). Further, when perceived behavioral control (PBC) was added to the model, both attitudes (Beta = .54, p < .001) and PBC (Beta = -.37, p < .001) were significant predictors of AAS intentions. With respect to other drug use behaviors, the past use of AAS was not significantly correlated with the use of alcohol, cigarettes, chewing tobacco, marijuana, or cocaine. Similar results were found for an adolescent sub-sample of 59 male weightlifters (Mean age = 19.9).

These results provided strong support for the TRA (TPB) as an accurate model for explaining male weightlifters' motivation (intentions) to use AAS. Implications for the primary prevention of AAS based on these models are discussed in detail.

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Despite growing appreciation of nonmedical anabolic-androgenic steroid (AAS or steroids) use as a significant social and health-risk concern (Lin & Erinoff, 1990; Yesalis, Kennedy, Kopstein, & Bahrke, 1993), current understanding of this phenomenon falls far short of other drug use behaviors. A substantial literature now documents the incidence, prevalence, and potential health consequences of AAS use (see Yesalis, 1993a for a review), but research focused on etiology is lacking. Several studies have found that AAS are taken to enhance appearance, performance, size, and strength, yet the potential deterrents to AAS use and the mechanism through which these motives operate have not been examined (e.g., Buckley et al., 1988; Moore, 1988). This deficit in knowledge is notable since steroid prevention programs are currently required by law and effective preventive efforts must be designed with a clear understanding of how specific determinants motivate drug use (Ellickson, Hays, & Bell, 1992; Semlitz & Gold, 1986).

The present study is an initial attempt to partially fill this void. It uniquely examined the motivation to use AAS within a social-psychological framework which has been successfully applied to explain other drug use behavior (e.g., cigarettes, alcohol, & marijuana) for almost two decades (e.g., Pomazal & Brown, 1977).
Overview and Critical Assessment of Anabolic Steroid Literature

In the last decade, the use of AAS has spread from a select group of athletes to the general population (Yesalis, 1993b; Yesalis, Anderson, Buckley, & Wright, 1990). The proliferation of use has been documented in both adult and adolescent populations with increasing frequency (Yesalis, 1993b; Yesalis, Kennedy, Kopstein, & Bahrke, 1993). Among adults, the reported prevalence of AAS ranges from about 2% of male college students (Pope, Katz, & Champoux, 1988) to at least 50% of competitive bodybuilders (Tricker, O’Neil, & Cook, 1989). Likewise, some 5% of adolescent males (USDHHS, 1991) and as many as 2.5% of high school females (Terney & McLain, 1990) have reported AAS use, with the risk of steroid use being particularly high among competitive athletes (e.g., in football, track and field, swimming) and weightlifters. Furthermore, due to self-report biases, it is suspected that these survey estimates represent a lower bound of actual use (Yesalis, 1993b; Buckley et al., 1988).

Although a number of deleterious cosmetic, physical, and psychological effects of AAS have been cited in the medical literature (e.g., acne, liver dysfunction, and depression), the long-term health risks remain uncertain (see Haupt & Rovere, 1984 for a review; Bahrke, 1993; DiPasquale, 1990). Nonetheless, the potential complications of steroid use during physical and psychological maturation are clearly precarious and are
likely irreversible (Johnson, 1990; Rogol, Martha, & Blizzard, 1990). For instance, AAS administration during adolescence can produce stunted growth due to premature epiphyseal closure (i.e., bone fusion) (Johnson, 1990). The need for primary prevention is further highlighted by recent reports of physical and psychological dependence on AAS (e.g., Brower, 1993b; Kaskin & Kleber, 1989; Yesalis, Vicary, & Buckley, 1993), an alarming trend when one considers that steroid use is frequently initiated during adolescence (Anderson, Albrecht, Mckeag, Hough, & McGrew, 1991; Yesalis, Vicary, & Buckley, 1993).

Many factors have been implicated as probable motives underlying AAS use including: Low self-esteem (Brower, 1993a), disturbances in body-image (Brower et al., 1991; Komoroski & Rickert, 1992) and self-image (Giannini, Miller, & Kocjan, 1991), the desire to succeed at any cost (Voy, 1991), the perceived impossibility of attaining personal goals without AAS (Anshel, 1991), and social pressure (Giannini, Miller, & Kocjan, 1990; Johnson, Jay, Shoup, & Rickert, 1989). However, how these motives influence behavior (i.e., steroid use) has not been specifically addressed.

On a similar note, several recent studies suggest that a certain constellation of attitudes, beliefs, and perceptions may constitute a psychological vulnerability to AAS use (Brower et al., 1991; Buckley et al., 1988; Goldberg et al., 1991; Johnson et al., 1989; Komoroski & Rickert,
1992; Thompson et al., 1991). For instance, Krowchuk et al. (1991) found that some adolescent male athletes reported a positive attitude toward AAS use for improving athletic performance. Furthermore, Buckley et al. (1988) found that AAS users were more extreme in their health perceptions than non-users and Brower et al. (1991) reported that "feeling not big enough" was a significant predictor of steroid dependence. While these studies are informative with respect to identifying possible antecedents to AAS use, systematic, theory-bound research on these proximal factors is lacking.

The association between AAS and other drug use is an important question that has been addressed in several recent reports (e.g., Brower et al., 1991; DuRant, Rickert, Ashworth, Newman, & Slavens, 1993; DuRant, Ashworth, Seymore, Newman, & Rickert, 1994; Komoroski & Rickert, 1992; Yesalis et al., 1990). The extant literature on AAS indicates that steroid users commonly use or abuse a multitude of substances. For instance, two recent surveys (Durant et al., 1993; Yesalis, Kennedy, Kopstein, & Bahrke, 1993) found significant correlations between AAS use and the use of other illicit drugs, alcohol, and tobacco. However, these conclusions may be biased by the study of adolescent populations who typically experiment with a variety of substances (e.g., Jesser & Jesser, 1977; Jesser, Donovan, & Costa, 1991). Hence, the association between AAS use and other drug use must be examined within different at-risk populations since it must be
established whether distinct approaches for steroid prevention are necessary (Jarret et al., 1991; Yesalis Anderson, Buckley, & Wright, 1990).

Legislators and health researchers acknowledge that steroid interventions are imperative (Lin & Erinoff, 1990; USDHHS, 1991) and must begin prior to experimentation (Buckley et al., 1988; Hallagan, Hallagan, & Snyder, 1990; Yesalis et al., 1990). In fact, the federal health objectives for the year 2000 (USDHHS, 1991) includes a reduction in AAS use by male high school seniors (from 4.7% to 3%). Although several investigators have advocated education as a feasible and cost effective means of curbing AAS use (Hallagan, Hallagan, & Snyder, 1989; Johnston, 1991), it appears that educational (i.e., information-only) programs are insufficient and perhaps encourage experimentation (Brower, 1990; Carlson, Cleary, Thompson et al., 1991; Goldberg, Bosworth, Elliot, Bents, 1990). However, despite federal and state mandates for AAS education, prevention, and intervention (Buckley, Yesalis, & Bennell, 1993; Dubin, 1990), there continues to be a lack of general research on AAS directed toward the development of AAS programs (Buckley et al., 1993).

Purpose

The National Institute on Drug Abuse (NIDA) recently published a "state-of-the-art" monograph on anabolic steroid abuse (Lin & Erinoff, 1990)
to review the current knowledge on AAS and recommend directions for future research. Within this volume, Yesalis et al. (1990) concluded that "adolescent and adult anabolic steroid users need to be profiled, ... a better understanding of the process involved in initiating and continuing anabolic steroid use needs to be achieved... [and]...the association of anabolic steroid use with other illicit drugs or alcohol needs to be examined" (p. 108). The conclusions of Yesalis et al. (1990) concur with the above literature review and underscore the need for conceptually driven preventive research on the antecedents of steroid initiation and use. Hence, the primary objective of this study was to achieve a greater understanding of the cognitive and psychosocial determinants of AAS use motivation (i.e., antecedents to initiation) through the application of the Theory of Reasoned Action (TRA; Ajzen & Fishbein, 1980). Secondarily, this study sought to compare the TRA with the Theory of Planned Behavior (TPB; Ajzen, 1988) and to examine the relationship between AAS use and other illicit drugs, tobacco, and cigarettes within this population.

**Overview of the Theory of Reasoned Action (TRA)**

The TRA (Figure 1) is a value-expectancy model which postulates that any behavior is directly determined by an individual’s behavioral intention (BI) to perform the particular behavior (Ajzen & Fishbein, 1980; O’Conner &
Saunders, 1992). Within the model, behavioral intention is the most proximal determinant of behavior and the most accurate predictor, when properly measured. Furthermore, BI has two conceptually distinct antecedents: personal attitude toward performing the behavior (ATT), and subjective norm (SN). ATT represents a general evaluation of favorableness (or unfavorableness) toward the behavior (Ajzen & Fishbein, 1980). Likewise, SN captures the perceived normative influences upon the individual with respect to the specific behavior (i.e., what most people important to the individual think he/she should do) (Ajzen & Fishbein, 1980).

Theoretically, behavioral intention is a product of a weighted sum of ATT and SN, although one or the other may be more influential (Tesser & Shaffer, 1990). In a multiple regression paradigm, if ATT becomes associated with a high beta weight relative to SN, then the behavior is considered to be under attitudinal control (Trafimow & Fishbein, 1994). Conversely, if the opposite pattern occurs, the behavior is assumed to be under normative control. On balance, the TRA literature indicates that most behaviors are attitudinally driven (Trafimow & Fishbein, 1994; Sheppard, Hartwick, & Warshaw, 1988). Factors other than ATT and SN may be associated with the behavior (or BI) but, according to the model, their effects must be fully mediated by either ATT or SN (Ajzen & Fishbein, 1980).
Although general measures of attitude and subjective norm are sufficient to predict intention, examining the specific determinants of ATT and SN (i.e., underlying beliefs and evaluations) provides a richer understanding of the behavior. Knowledge of the salient beliefs which characterize a population provides a basis for the development of strategies to influence behavior in the desired direction (Ajzen & Fishbein, 1980). For instance, to deter the performance of a particular behavior, one could create a message to change beliefs (or belief evaluations) in a manner which would produce a less favorable attitude toward the behavior (i.e., increase negative expectancies and decrease positive expectancies) and, in turn, a weaker intention to perform the behavior.

There is converging support for the TRA as a parsimonious explanation of behavior (Ajzen & Madden, 1985; Sheppard, Hartwick, & Warshaw, 1988). The TRA constructs characterize motivational influences (Pomazal & Brown, 1977; Fishbein & Middlestadt, 1987) and their significance as indicators of subsequent heath behavior is well substantiated in the literature (e.g., Ajzen & Fishbein, 1980; Bentler & Speckart, 1981; Tesser & Shaffer, 1990). For instance, behavioral intentions have proven to be significant predictors of smoking (Chassin et al., 1981, 1984), alcohol use (Ajzen & Fishbein, 1980; Schlegel, Crawford, & Sanborn, 1977), marijuana use (Pomazal & Brown, 1977), and medicine use (Bush & Iannotti,
In response to recent findings that the TRA may not sufficiently account for behaviors that are not purely volitional, Ajzen (Ajzen, 1988; Ajzen & Madden, 1986) recently expanded the TRA model to include a concept of behavioral control comparable to Bandura’s (1986) notion of perceived self-efficacy. However, perceived behavioral control (PBC), the individual’s assessment as to how easy or difficult the performance of a behavior is likely to be, is considered a broader concept than self-efficacy since PBC takes into account factors beyond the individual’s perceived ability such as anticipated environmental and situation constraints upon behavior (Ajzen, 1988). With the addition of PBC, the TRA was relabeled as the Theory of Planned Behavior (TPB; Figure 2; Ajzen & Madden, 1986).

The TRA was selected as the initial model for exploring the motivation to use steroids since it is nested within the TPB. Furthermore, Fishbein and Middlestadt (1987) have suggested that the TRA can guide research into the determinants of different drug use behaviors and serve as a framework for developing educational interventions directed at changing these behaviors. Finally, the TRA lends itself to research directed at steroid prevention since AAS has been characterized as a goal-directed, volitional behavior (Anshel, 1991; Hatfield, 1982).
Methods

Participants

A total of 109 male weightlifters volunteered to participate in the study. Eighty-two participants were recruited from a large gym (approximately 2500 members) in Southwestern Virginia. Written permission was obtained from the gym manager prior to commencement of the study. An additional twenty-seven (27) participants were undergraduate psychology students enlisted in an effort to make the sample more diverse, particularly with respect to demographic characteristics and weightlifting experience. The survey was available to all males who lifted weights at least 1 day per week (on average) and were under 40 years of age.

Although 109 surveys were collected, six participants were eliminated from the study because their responses were incomplete or deemed invalid due to inconsistent response patterns (e.g., endorsing mutually exclusive questions). Hence, the total sample consisted of 103 male weightlifters. The mean age of participants in the total sample was 23.3 years. On average, participants in the total sample had completed 3.2 years of college and had been lifting weights for 6.2 years. Overall, Participants could be described as "recreational" weightlifters since only 3 participants (2 adults and 1 adolescent) indicated an intention to compete in bodybuilding or powerlifting, and less than 30% of the total sample reported regular
participation in any sport outside of weightlifting.

**Procedure**

Data was collected over a two week period (from 9/28/1994 to 10/11/1994). Each subject was given a 14 page questionnaire which required approximately 25 minutes to complete (Appendix D). Psychology students were surveyed in small groups. Gym participants were approached individually by the experimenter in the gym and asked to complete the questionnaire either before or after working out, as done by Brower et. al (1991) in their study of AAS users. The surveys were disbursed at the gym during the gym’s peak hours (around 8:00am & 5:00pm) so that a large variety of participants would be available for the study. All men entering the gym were invited to participate in the study regardless of their apparent muscular development or presumed weightlifting experience.

The front page of the survey explained the purpose of the study and gave assurance of anonymity and confidentiality (Appendix B). Following a brief introduction, each potential participant was asked to take the survey only if he was "absolutely willing to tell the truth about his drug use history and other personal health behaviors." Prior to participation, each potential participant read and signed an informed consent form (Appendix C).

Participants were directed not to put any identifiers on the survey and
they were encouraged to complete the questionnaire in a private area at the front of the gym. Finally, to further secure confidentiality, participants were instructed to seal the completed questionnaire inside a provided envelope and deposit it in a specially designated box. One-hundred percent (n = 117) of the male weightlifters approached by the experimenter at the gym indicated a willingness to participate in the study. However, many weightlifters were reportedly in a hurry, thus only 82 participants (70%) were able to take the survey when it was available.

Survey Measures (Appendix D)

Theory of Reasoned Action Constructs

Following the procedures prescribed by Ajzen and Fishbein (1980), measures of attitude (DIRATT, INDIRATT), subjective norm (DIRSN, INDIRSN), and behavioral intention (ASINT) were constructed.

Salient beliefs and referents. To ensure that the specific beliefs and referents surveyed in the final questionnaire were valid and appropriate to the behavior (i.e., AAS use) and population (i.e., male weightlifters) of interest, a pilot study (Appendix A) was conducted to identify salient attitudinal (behavioral) beliefs (i.e., BB) and salient referents.

Twenty-two behavioral beliefs (BB) regarding personal AAS use were assessed in the final questionnaire (Appendix D). Nine BBs were positive
consequences of AAS use (e.g., allow me to make rapid gains in size, allow me to have an increased appearance) and 13 BBs were negative consequences of AAS use (e.g., make me get cancer, make me get acne). The behavioral beliefs were preceded by the statement "My using anabolic steroids at sometime over the next 12 months would ..." and responses were assessed on a 7-point likert scale ranging from 3 (likely) to -3 (unlikely). Cronbach's alpha for the scale of 22 BBs was .89.

For each BB there was a corresponding outcome evaluation (OE). This variable measured respondents' evaluation of each behavioral belief on a 7-point likert scale ranging from 3 (good) to -3 (bad). For instance, the OE statement for the BB of "making me get liver damage" was "My getting liver damage is...". Cronbach's alpha for the scale of 22 OEs was .73.

Normative beliefs (NB) measured the perceived social pressure from each of the five important referents elicited in the pilot study (i.e., parents, friends, girlfriend, boss, & Family). Normative beliefs were measured on a 7-point likert scale ranging from 3 (I should) to -3 (I should not). For instance, the statement for the referent "parents" was "My parents think I should...I should not use anabolic steroids sometime over the next 12 months." Cronbach's alpha for the scale was .76.

Finally, respondents' motivation to comply (MC) with each referent was assessed on a 7-point likert scale ranging from 1 (not at all) to 7 (very
much). For example, the MC scale for the referent "parents" was "Generally speaking, how much do you want to do what your parents think you should do?" Cronbach’s alpha for the scale was .88.

**Attitude towards AAS use.** Attitude toward personal AAS use was measured directly and indirectly.

The direct measure of attitude (DIRATT) was assessed with three 7-point semantic differential items ranging from -3 to 3 (i.e., Foolish-Wise, Good-Bad, and Rewarding-Punishing) for "My using anabolic steroids over the next 12 months is:""). This scale demonstrated high internal consistency (Cronbach’s alpha = .87), thus the three items were averaged into a single index.

The indirect measure of attitude (INDIRATT) was derived from the elicited behavioral beliefs and outcome evaluations according to the formula provided by Ajzen and Fishbein (1980): For n = 1 to 22, INDIRATT = Summation (BBn X OEe).

**Social Norm.** Analogous to attitude, the social normative influence upon AAS use was evaluated directly and indirectly.

The direct measure of social norm (DIRSN) was assessed with the single question "Most people who are important to me think I should...I should not use anabolic steroid sometime over the next 12 months."

Responses were indicated on a 7-point likert scale ranging from 3 (I should)
to -3 (I should not).

The indirect measure of social norm (INDIRSN) was derived from the NB and MC scores according to the formula provided by Ajzen and Fishbein (1980): For \( n = 1 \) to 5, \( \text{INDIRSN} = \text{summation (NB}_n \times \text{MC}_n) \).

**Intention to use AAS (ASINT).** Intention to use AAS was assessed with a single item: "How likely are you to use anabolic steroids at sometime over the next 12 months?" Responses were measured on a 7-point Likert scale ranging from 3 (likely) to -3 (unlikely). Respondents who reported a positive intention to use AAS were classified as "intenders" and respondents who reported a neutral (i.e., 0) or negative intention to use AAS were classified as "non-intenders".

**Other Measures**

**Perceived Behavioral Control (PBC).** Perceived behavioral control was measured with a single item. Each respondent was asked to indicate on a scale of 0% to 100% "how confident you feel at this moment that you can achieve your [weightlifting] goal [for the next 12 months] without the use of anabolic steroids”.

**Perceived Strength.** Perceived strength was measured with a single item which asked participants to report how strong they were relative to other weightlifters their age. The item was rated on a 3-point likert scale from 1 (below average strength) to 3 (greater than average strength).
Buckley et al. (1988) found that AAS users perceived themselves as stronger than non-users.

**Ineffectiveness (INEFF).** This 11 item scale, drawn from the Eating Disorders Inventory (EDI) (Garner & Olmstead, 1984), assesses feelings of general inadequacy, insecurity, worthlessness, emptiness, and lack of control over one’s life. INEFF is conceptually similar to low self-esteem with high scores on this scale reflecting a deficit in self-esteem. Although the relationship between self-esteem and health behaviors is unclear (Bush & Iannotti, 1985), some researchers postulate that low self-esteem is a risk factor for drug use (Botvin & Wills, 1986). The Chronbach’s alpha for the scale in the study was .80.

**Weightlifting Goals.** Weightlifting goals were evaluated with two questions. First, respondents’ were asked to list their primary weightlifting goal for the next 12 months (GOAL). Second, respondents’ were asked to rate the importance of this goal (GIMP) on a scale of 0% to 100%.

**Sociodemographics.** Demographics included age and years of education. Weightlifting experience (years of participation) and number of weightlifting sessions per week were also assessed to characterize the sample.
**Substance Use History.** Questions on past use of cigarettes, alcohol, chewing tobacco, marijuana and cocaine were adopted from the 1990 National Household Survey in Drug Abuse (NHSDA; see Turner, Lessler, & Gfroerer, 1992). For each substance, questions were asked in reference to use "in the last 12 months". Two additional questions assessed the quantity of drinking over the past 30 days.

**Anabolic Steroid Use History.** Both duration and intensity of past AAS use were assessed to determine AAS use status. Participants who endorsed any history of AAS use were classified as "users" and participants who endorsed no history of AAS use were classified as "non-users".

**Statistical Analyses**

Means and standard deviations were used to describe the total sample and adolescent sub-sample. Pairwise associations were tested with Pearson correlations ($r_p$) for continuous measures and Spearman's rank correlations ($r_s$) for ordinal measures. Multiple regression analysis was used to evaluate the TRA and TPB, regressing AAS intention (ASINT) on the components of each theory for the total sample and the adolescent sub-sample. Finally, MANOVAs and univariate F tests were conducted on salient behavioral beliefs, outcome evaluations, normative beliefs, and motivation to comply scores to test for differences between intenders and non-intenders in the total sample and the adolescent subsample.
Results

Sample Characteristics

As anticipated, Univariate F tests revealed that the 27 undergraduate psychology students were significantly younger \((p < .001)\), had significantly less years of weightlifting experience \((p < .001)\), and lifted weights significantly fewer times per week \((p < .001)\) as compared to the 82 gym participants. However, no significant differences were found for any of the TRA/TPB constructs.

Within the total sample were 17 participants \((16.5\%)\) who reported the past use of AAS (referred to as users) and 9 participants \((8.7\%)\) who reported a positive intention to use AAS at some time over the next 12 months (referred to as intenders). Univariate F tests on selected sample characteristics and proximal variables are summarized in Table 1a. In general, male weightlifters in the total sample maintained strong negative attitudes \((DIRATT = -2.1)\) and strong negative social norms \((DIRSN = -2.6)\) for personal AAS use. As shown in Table 1a intenders were the only group with positive attitudes \((DIRATT = 0.9)\) and intentions \((ASINT = 2.2)\) toward AAS use and intenders evidenced significantly less perceived behavioral control over AAS use as compared to non-intenders \((\text{Mean PBC: intenders} = 48.9, \text{non-intenders} = 90.4)\).
In response to the recent interest in adolescent steroid use (e.g., Lin & Erinoff, 1990) a sub-sample of 59 adolescents was separately analyzed. Participants under the age of twenty-two (22) were classified as adolescence based upon the U.S. Department of Health and Human Services (1984) age criteria for adolescence (i.e., 12-22). Hence, fifty-nine (59) adolescents (Mean age = 19.9; Age range: 18-22) composed a subsample of male weightlifters within the total sample. Four respondents (6.8 %) in the subsample reported the past use of AAS and 4 (6.8 %) respondents reported a positive intention to use AAS at sometime over the next 12 months. Selected characteristics for the adolescent subsample are reported in Table 1b. As shown in Table 1b, adolescents’ mean intentions (ASINT = -2.6), attitudes (DIRATT = -2.3), and subjective norms (-2.8) were strongly negative and significant differences in PBC were found between adolescent intenders (PBC = 43.8) and non-intenders (PBC = 88.9), as in the total sample. Despite the small number of adolescent intenders, several significant differences were found between adolescent intenders and non-intenders (Table 1b). Finally, AAS intenders in both the total sample and the adolescent subsample perceived themselves to be significantly stronger than non-intenders (Tables 1a & 1b).

**TRA Constructs and Related Variables**

Correlations among the TRA constructs and related variables for the
total sample are reported in Table 2a. Two associations are of particular note. First, as postulated by the TRA, high significant correlations were found between ASINT and its antecedents in the model (i.e., DIRATT: \( r_p = .74; p < .001 \); DIRSN: \( r_p = .48; p < .001 \)). Second, significant correlations were found between the direct (DIRATT) and indirect (INDIRATT) measure of attitude (\( r_p = .55; p < .001 \)) and the direct (DIRSN) and indirect (INDIRSN) measure of social norm (\( r_p = .52; p < .001 \)) in the total sample. According to Ajzen and Fishbein (1980) the significance of the aforementioned correlations supports the analysis of subgroup differences in underlying behavioral and normative beliefs (Tables 4a & 4b).

A very similar pattern of intercorrelations was found for the adolescent subsample (Table 2b). The only notable divergence with the total sample is the lack of association between INEFF and ASINT (\( r_p = .00; p = .62 \)) and the relatively smaller correlation between DIRSN and INDIRSN (\( r_p = .27; p < .01 \)) in the adolescent subsample.

Model to Explain Intention to Use AAS

Total Sample

Table 3a presents the results of a hierarchial regression analysis for the total sample, regressing ASINT on the TRA constructs and other proximal variables. On step one, DIRATT and DIRSN explained 55% of the
variability in ASINT (i.e., $R^2 = .55$) and DIRATT significantly predicted ASINT (Beta = .72; $p < .001$) while DIRSN did not (Beta = .03; $p < .69$). Hence, step one demonstrates the overall strength of the TRA model for explaining motivation to use AAS within the total sample (Figure 3a).

When PBC was introduced into the model on step two (Figure 4A), the model’s explanatory power was significantly improved ($p < .01$) with the three constructs (DIRATT, DIRSN, & PBC) explaining 67% of the variation in ASINT (i.e., $R^2 = .67$). PBC was a significant predictor of ASINT (Beta = -.37; $p < .001$), accounting for an additional 11% ($p < .01$) of the variation in respondents’ intentions to use steroids. Consequently, the data demonstrates the utility of the TPB as a superior model to the TRA for the prediction of participants’ intentions to use steroids.

Finally, on step three, three variables "external" to the TPB were introduced into the analysis to test the sufficiency of the model (i.e., TPB). Since each variable significantly differentiated intenders from non-intenders (in both the total sample and the adolescent subsample), past AAS use, ineffectiveness, and perceived strength were entered on step three through stepwise selection (criteria: $p = .01$ for entry; $p = .01$ for removal). As indicated in Table 3, only ineffectiveness (INEFF) entered the model as a significant predictor of ASINT (Beta = .14; $p < .05$) in the total sample. INEFF accounted for a small (2%) but significant ($p < .01$) amount of unique
variance.

**Adolescent Sub-Sample**

Table 3b presents the results of a hierarchical regression analysis regressing ASINT on the TRA constructs and related variables as above. The results resemble those found with the total sample, but two important differences were found. First, within the adolescent subsample, DIRSN entered the model on step one as a significant predictor of ASINT (Beta = .21; p < .05). Further, on step three, no external variables (i.e., past AAS use, ineffectiveness, and perceived strength) entered the model after controlling for the effects of the TPB constructs.

**Factors Differentiating Respondents who Intended to Use AAS and Did Not Intend to Use AAS**

**Total Sample**

To better understand why some participants intended to use steroids and others did not, comparisons were made between the two sub-samples (intenders vs. non-intenders) on mean behavioral beliefs, outcome evaluations, normative beliefs, and motivation to comply scores. For behavioral beliefs, MANOVA revealed a significant overall difference between the two groups (Wilk’s Lambda = .49), F(10, 39) = 3.73, p < .001, and follow-up univariate F tests showed significant differences for eight of
the 22 salient beliefs (Table 4). Likewise, MANOVA revealed significant differences between the mean vectors of the two groups’ outcome evaluations (Wilk’s Lambda = .46), $F(10,39) = 4.30, p < .001$, and subsequent univariate F tests indicated significant differences for six of the 22 evaluation scores. For normative beliefs, MANOVA confirmed significant overall differences between the two groups (Wilk’s Lambda = .81), $F(1.5,47.5) = 4.56, p < .001$, and follow-up univariate F tests revealed significant differences for four of the five belief ratings (Table 6a). However, MANOVA revealed no overall significant differences between the groups’ motivation to comply scores (Wilk’s Lambda = .95), $F(1.5,47.5) = 1.01, p = .42$, and no significant differences were found in univariate analysis

**Adolescent Sub-Sample**

As with the total sample, to better understand why some adolescents intended to use steroids and others did not, comparisons were made between the two sub-samples (intenders vs. non-intenders) on mean behavioral beliefs, outcome evaluations, normative beliefs, and motivation to comply scores (Table 5a). For behavioral beliefs, MANOVA revealed a significant overall difference between the two groups (Wilk’s Lambda = .46), $F(10,17) = 1.91, p < .04$, and follow-up univariate F tests showed significant differences for four of the 22 salient beliefs (Table 5a). Likewise, MANOVA revealed a significant overall difference between the two groups’ outcome
evaluations (Wilk’s Lambda = .28), \( F(10,17) = 4.2, p < .001 \), and subsequent univariate F tests indicated significant differences for four of the 22 scores.

For normative beliefs and motivation to comply scores, MANOVA revealed a significant overall differences between the two groups (Wilk’s Lambda = .66), \( F(4,23) = 2.5, p < .02 \), and follow-up univariate F tests revealed significant differences for 2 of the 5 normative beliefs and two of the five motivation to comply scores (Table 5b).

**Weightlifting Goals**

No significant differences were found between groups (i.e., intenders vs. non-intenders) on GIMP. However, content analysis of the reported goals confirmed that intenders described more ambitious (i.e., greater muscle gains) and more specific goals than non-intenders. For example, with respect to gaining body weight, intenders generally stated an exact number of pounds (mean = 12.5) while non-intenders typically reported the goal of "gaining muscle mass".

**Drug Use in Male Weightlifters**

**Total Sample**

Intercorrelations, means, and standard deviations for the surveyed substance use behaviors are reported in Table 6a. Examination of the means
shows that the overall substance use in the total sample is generally very low with the exception of alcohol consumption.

On average, respondents’ in the total sample reported consuming 8.65 alcoholic drinks in a single day during the past month (i.e., MDRK) and getting drunk an average of three times per month (DRNK). Significant positive correlations were found between these two measures of drinking (alcohol) behavior (i.e., MDRK & DRNK) and chewing tobacco, cigarette smoking, and marijuana use over the past 12 months (Table 6a). Significant negative correlations were also found between NDRK and MDRK/DRNK and a significant positive correlation was found between smoking (NSMK) and chewing tobacco (NCHW). No other drug use was significantly associated with past AAS use (NAAS & NCYC). Finally, in multiple regression analysis, the past use of AAS (NCYC) significantly predicted the intention to use AAS at sometime over the next year ($R^2 = .16; p < .001$).

**Adolescent Subsample**

The reported use of chewing tobacco, marijuana, cocaine, and anabolic steroids was extremely small in the adolescent subsample. However, adolescent alcohol consumption and smoking were substantially greater than in the total sample.

The overall pattern of intercorrelations mirrors that found in the total sample with several exceptions (Table 6b). First, smoking (NSMK) was
significantly associated with chewing tobacco (NCHW), but not with any other drug use behavior. Furthermore, a significant positive correlation was found between frequency of alcohol consumption (NDRK) and marijuana use (NPOT).

**Discussion**

The primary purpose of this study was to explore the factors which motivate male weightlifters to use AAS through application of Behavioral Intention Theory (e.g., the TRA & TPB; Bush & Iannotti, 1985). Previous research has suggested anabolic steroid use is a complex phenomenon potentially influenced by personal beliefs, attitudes, and social norms. However, this study represents a first attempt to place AAS use within a specific social-psychological framework which can more effectively describe the antecedents to steroid use and promote the development of intervention strategies.

The present research provided strong support for the TRA as a parsimonious model for explaining male weightlifters’ motivation (intentions) to use AAS (Sheppard, Hartwick, & Warshaw, 1988). Overall, the TRA constructs (i.e., attitude & subjective norm) accounted for nearly 70% of the variance in respondents’ intentions to use steroids, a finding comparable to other applications of the TRA (Ajzen, 1988; Sheppard, Hartwick, &
Although the accuracy of the TRA was largely supported, the TPB proved to be a superior model for understanding AAS use since the addition of PBC significantly increased the model’s explanatory power (11% within the total sample & 8% within the adolescent subsample). The significance of INEFF as a predictor of ASINT for the total sample does not violate the basic premise of the TRA (or TPB) since the amount of unique variance explained by INEFF (2%) was small relative to the TRA (or TPB) constructs (Pomazal & Brown, 1977). Furthermore, since no variables "external" to the model were significant predictors of ASINT within the adolescent subsample, it is possible that the direct effect of INEFF on ASINT in the total sample was a consequence of measurement error. In particular, the insufficient measurement of the TRA/TPB constructs (e.g., if the direct measures of attitude and subjective norm were too general) could have interfered with the model’s ability to fully mediate the effects of INEFF. However, there are two other possibilities: 1) the adolescent sub-sample may be unique (i.e., different from the overall sample), and 2) there may have been insufficient power to observe the effects of INEFF in the adolescent sub-sample because of the reduced sample size.

As hypothesized, the intention to use AAS was primarily driven by participants’ attitudes. Similar results have been noted when the TRA has
been applied to other drug use behaviors (Ajzen & Fishbein, 1980; Chassin et al., 1981, 1984; Pomazal & Brown, 1977). Furthermore, attitudes and intentions toward AAS use were strongly negative within both the total sample and the adolescent subsample. These findings are consistent with recent reports of negative attitudes and social norms regarding AAS use (Goldberg et al., 1991; Johnston, O’Malley, & Bachman, 1993; Krowchuk et al., 1989). For example, Johnston, O’Malley, and Bachman (1993) found that some 70% of highschool students reported that AAS were a "great risk" to peoples’ health and over 90% indicated that they "disapprove" or "strongly disapprove" of people who use AAS. These findings were replicated in the present study (Tables 1a & 1b).

The results of this study have several important implications for the primary prevention of anabolic steroid use. First, the application of the TRA/TPB suggests that male weightlifters with the strongest intentions of using AAS can be identified by their specific attitudes, subjective norms, and perceived behavioral control. Hence, following the assumptions of the TRA (& TPB), it should be possible to decrease at-risk weightlifters’ intentions to use AAS and subsequent AAS use by influencing their attitudes, social norms, and perceived behavioral control for personal steroid use.

With respect to attitudes, a reduction in AAS intentions may be accomplished through education and persuasive communication directed at
the salient beliefs which differentiate AAS intenders from non-intenders. For instance, although temporary sterility and liver dysfunction are well documented side effects of AAS use (DiPasquale, 1990), AAS intenders were found to have a negative and significantly lesser belief in these outcomes than non-intenders. Therefore, to the extent that other groups of weightlifters possess these behavioral beliefs, AAS programs could present data elucidating these consequences within a balanced educational approach (Goldberg et al., 1991).

Likewise, the results of this study suggest that social norms may be meaningful influences upon AAS intentions among some population segments since DiRSN was found to be a significant predictor of ASINT in the adolescent subsample of this study. In response to this finding, AAS prevention programs targeting adolescent weightlifters should make use of the identified referents for this population (e.g., friends) as influential role models and educators who can impact upon AAS intentions.

Finally, effective AAS interventions should address male weightlifters' perceived behavioral control, the final antecedent to AAS intention within the TPB framework. In this study, respondents' confidence in attaining personal weightlifting goals while abstaining from AAS was used as the measure of PBC. Hence, the finding that AAS intenders possess significantly lower PBC than non-intenders supports Ashel's (1991) report that AAS use is motivated
by the perceived inability to achieve personal goals without AAS use.

However, it is interesting to note that intenders also perceived themselves to be significantly stronger than non-intenders. Thus, although steroid intenders had more ambitious goals than non-intenders, the goals of intenders are probably achievable with proper weight training (e.g., gaining 15 pounds). Therefore, influencing PBC to improve weightlifters’ faith in their ability to achieve particular weightlifting, bodybuilding, or performance goals appears critical for AAS prevention. A similar conclusion was reached in a study by Thompson et al. (1991) which found that adolescent football players (e.g., a sample predisposed to AAS use) has misconceptions about proper weight training techniques.

The effect of PBC (on ASINT) is of particular interest since exclusively informational/belief-based programs for drug prevention have demonstrated little success at changing behavior (O’Conner & Saunders, 1992). Several approaches which could be taken to enhance male weightlifters’ PBC within the context of an AAS prevention program include: direct experience with positive weightlifting role models, verbal persuasion targeting negative control beliefs, goal-setting, and mastery experiences with weight training (Ajzen & Madden, 1986; Bandura, 1986).

The finding that DIRSN did not receive a significant beta weight within the total sample is consistent with both the TRA (TRB) (Pomazal & Brown,
behavior of interest, one determinant may be more important than the other, and only one of the two may be significant (Netemeyer, Burton, & Johnston, 1991).

Within this study, applications of the TRA and TPB suggest that social norms may not be an important determinant of adult male weightlifters’ intentions to use AAS. However, normative influences (i.e., DIRSN) such as social reinforcement (e.g., Brower et al., 1991), group affiliation (e.g., Anshel, 1991; Giannini, Miller, & Kocjan, 1991; Johnson et al., 1989) have been frequently cited as probable determinants of AAS use. Likewise, several authors have noted a similarity between AAS use and other drug use behaviors, suggesting that the antecedents to steroid use (e.g., social influences) may be comparable to other substance use behaviors where social norms are potent predictors of drug involvement (Goplerud, 1991). Hence, it was hypothesized that DIRSN would be a significant determinant of ASINT for the total sample.

Although social norms was not a significant predictor of ASINT in the total sample of this study, there are several reasons to question this finding. First, the multicollinearity between attitudes and social norms ($r_p = .62$, $p < .001$) makes the Beta weights associated with each construct difficult to estimate and interpret (Miniard & Cohen, 1981; Pedhazur, 1980). In
reference to the TRA, Miniard and Cohen (1981) noted that this [i.e.,
 multicollinearity] can be a problem "when attempting to infer causation since
a potentially important predictor variable may appear to be insignificant" (p.
312). The importance of this point goes beyond this study since
multicollinearity is very common in various applications of the TRA/TPB and
it is rarely acknowledged.

With respect to the TRA, some researchers (e.g., Miniard & Cohen,
1981; Bandura, 1995) have suggested that the high correlation between
attitudes and subjective norms indicates that the two constructs are not
distinct from one another. To the degree that this assertion is accurate,
DIRSN may have been an insignificant predictor of ASINT in multiple
regression analysis since was competing with DIRATT for shared variance.

However, there is substantial support for the notion that attitudes and
subjective norms are independent constructs (e.g., Fishbein & Ajzen, 1981;
Trafimow & Fishbein, in press). Thus, the correlation between attitude and
subjective norm may be due to crossover effects between the constructs
(Oliver & Bearded, 1985; Trafimow & Fishbein, in press). In other words,
several studies have found that attitudes and subjective norms can directly
influence one another (Oliver & Bearded, 1985; Trafimow & Fishbein, 1994).
Ajzen and Fishbein (1981) acknowledge that crossover effects occur, but
they do not see this as a weakness in the model. Given the previous
discussion, potential paths between attitudes and social norms should be examined as viable modifications upon the TRA/TPB, since indirect effects are outside the framework of these models. Furthermore, structural equation modeling techniques should be used to explicitly tested and compare alternative models.

The nonsignificant correlations between AAS use and the other drug behaviors does not support recent research demonstrating significant associations between steroid use and the use of alcohol, cigarettes, marijuana, chewing tobacco, and cocaine (e.g., DuRant et al., 1993; DuRant et al., 1994). Although other drug behaviors were intercorrelated, within this sample of male weightlifters, AAS use does not appear to be part of the constellation of health risk behaviors described by Jessor & Jessor (1977) and others (Botvin & Wills, 1986; Jessor & Donovan, & Costa, 1991). On a similar note, Brower et al. (1994) found no significant correlation between AAS dependency symptoms and other substance use and Dimoff and Malone (1991) found steroid users rarely engaged in other drug use behaviors (other than alcohol consumption). Although an explanation for these relationships is beyond the scope of this study, it appears that the male weightlifters in this study were generally health oriented and doubtlessly considered most drug use discrepant with personal health and weightlifting goals.
A related drug use finding within this sample is a pattern of "binge drinking" evidenced by significant negative correlations between maximum alcohol consumption in a single day (MDRK) and typical drinking frequency (NRDK). Brower (1991) noted a similar pattern of high alcohol consumption and low cigarette use in a sample of AAS users. Further, MDRK showed the greatest association with other drug use behaviors (in the total sample and adolescent subsample), suggesting that binge drinking may be a risk factor for other drug use behaviors.

With respect to AAS prevention, the lack of association found between AAS use and other drug use behaviors and the relatively small contribution of INEFF (e.g., a general risk-factor for substance use) in the prediction of ASINT suggest that intervention strategies aimed at preventing and reducing AAS use should focus upon specific risk factors for AAS use (noted above). Hence, AAS prevention demands specific strategies beyond current drug prevention programs which emphasize general competencies (e.g., Botvin, 1983; Botvin & Wills, 1986; Goplerud, 1991). The comparable results (including drug use) for the total sample and the adolescent subsample suggests similar AAS programs may be effective in different population segments.

Also consistent with the Brower et al. (1991) study and other recent
indications of AAS dependence (Kaskin & Kleber, 1989; Yesalis, Vicary, & Buckley, 1993), is the finding that past AAS use significantly predicted the intention to use AAS within the total sample ($R^2 = .16; p < .001$). The cross-sectional design of this study precludes further conclusions concerning patterns of steroid use, but it appears that past AAS use is a risk factor for future steroid use.

The fact that most weightlifters agreed to participate in the study, despite the experimenter’s insistence on telling the truth, supports the validity of these findings. Furthermore, while no specific attempt was made to gather a representative sample of male weightlifters, the prevalence of steroid use within this sample (16.5%) was consistent with other studies which estimated AAS use within gyms (Yesalis, 1994). This finding lends further support to the generality of these finding to other samples of young male recreational weightlifters.

There are several further limitations of this study which should be addressed in future research on AAS use. First, the overall homogeneity of the sample surveyed in this study greatly restricts the generality of these findings to other populations of weightlifters. This limitation is particularly problematic for the adolescent subsample which included only "late" adolescents (age 18-22) (UDHH, 1984) with a high degree of educational attainment. Hence, future research on the etiology of anabolic steroid use
should include a greater range of participants since beliefs, attitudes, social
norms, perceived behavioral control, and AAS intentions are likely to vary
among population segments with different demographic characteristics (e.g.,
age, location, education) and weightlifting experience.

The primary focus upon AAS intentions rather than future AAS use is
one further drawback of this research. The cross-sectional design of the
study precluded the measurement of future AAS use. However, high
correlations have been found between intentions and behavior, particularly
with respect to drug use (Ajzen, 1988; Netemeyer, Burton, & Johnston,
1991) and intentions are considered excellent indicators of future drug use
(e.g., Wolford & Switzer, 1986). For instance, in a prospective study of
9,403 adolescents, Wolford and Switzer (1986) found that across all
substances the intention to use drugs was consistently related to self-
reported drug use. However, the purpose of this study was to examine the
"motivation" to AAS. Since many factors which influence drug use (e.g.,
availability) are different from those which motivate use (Pomazal & Brown,
1977), the cross-sectional design is less of an issue. Nonetheless, the
intervening factors between AAS intentions and AAS use should be
examined with prospective studies since an understanding of these
influences is critical for AAS prevention as well. Important influences should
be integrated into new models for explaining AAS use without losing touch
of the goals of parsimony and utility (Bandura, 1994).
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<th>Total Sample</th>
<th>Intenders*</th>
<th>Non-intenders</th>
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<tr>
<td>N</td>
<td>103</td>
<td>9</td>
<td>94</td>
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<td>24.0 (4.4)</td>
<td>23.2 (5.0)</td>
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<td>Years of College</td>
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<td>2.8 (1.7)</td>
<td>3.2 (2.2)</td>
</tr>
<tr>
<td>Years Lifting Weight</td>
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<td>7.2 (3.7)</td>
<td>6.1 (4.3)</td>
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<td>Workouts per Week</td>
<td>4.5 (1.4)</td>
<td>5.3 (0.9)*</td>
<td>4.5 (1.4)</td>
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<tr>
<td>AAS use Intention (ASINT)</td>
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<td>2.2 (0.8)**</td>
<td>-2.9 (0.6)</td>
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<tr>
<td>Attitude (DIRATT)</td>
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<td>0.9 (0.7)**</td>
<td>-2.4 (1.1)</td>
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<td>Subjective Norm (DIRSN)</td>
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<td>-1.4 (1.4)**</td>
<td>-2.7 (0.8)</td>
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<tr>
<td>PBC*</td>
<td>86.8 (19.4)</td>
<td>48.9 (16.7)**</td>
<td>90.4 (15.4)</td>
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<tr>
<td>INEFF*</td>
<td>1.1 (2.5)</td>
<td>2.7 (4.7)*</td>
<td>0.9 (2.2)</td>
</tr>
<tr>
<td>ASHM*</td>
<td>3.5 (0.6)</td>
<td>2.4 (0.5)**</td>
<td>3.6 (0.5)</td>
</tr>
<tr>
<td>ASAP*</td>
<td>2.3 (0.8)</td>
<td>1.1 (0.3)**</td>
<td>2.4 (0.7)</td>
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<td>Perceived Strength†</td>
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<td>2.8 (0.4)*</td>
<td>2.2 (0.7)</td>
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<td>GIMP†</td>
<td>75.2 (18.6)</td>
<td>74.7 (19.0)</td>
<td>80.3 (14.7)</td>
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</tbody>
</table>

***p < .001; **p < .01; *p < .05

*Intenders compared to non-intenders
†Perceived Behavioral Control
*Inefficiveness; Scored 0 to 30; Lower score indicates less ineffectiveness
*AAS perceived harm; Lower score indicates less perceived harm
*AAS perceived approval; Lower score indicates more approval
†Respondent’s perceived strength, Rated 1 (least) to 3 (most)
*Importance of respondents’ reported weightlifting goal (0%-100%)

Table 1a
Means and Standard Deviations for Selected Characteristics of Total Sample, AAS Intenders, and Non-Intenders

<table>
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<tr>
<th></th>
<th>Adolescent Sample</th>
<th>Intenders*</th>
<th>Non-intenders</th>
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<tr>
<td>N</td>
<td>59</td>
<td>4</td>
<td>55</td>
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<tr>
<td>Age</td>
<td>19.9 (1.9)</td>
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<td>19.9 (1.2)</td>
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<td>Years of College</td>
<td>2.01 (1.1)</td>
<td>1.8 (1.0)</td>
<td>2.0 (1.2)</td>
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<tr>
<td>Years Lifting Weights</td>
<td>4.4 (2.4)</td>
<td>5.5 (4.0)</td>
<td>4.2 (2.2)</td>
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<tr>
<td>Workouts per Week</td>
<td>5.2 (3.2)</td>
<td>5.5 (1.0)</td>
<td>4.2 (1.4)</td>
</tr>
<tr>
<td>AAS use Intention (ASINT)</td>
<td>-2.6 (1.3)</td>
<td>2.0 (0.8)**</td>
<td>-2.9 (0.4)</td>
</tr>
<tr>
<td>Attitude (DIRATT)</td>
<td>-2.3 (1.3)</td>
<td>0.9 (0.9)**</td>
<td>-2.6 (1.0)</td>
</tr>
<tr>
<td>Subjective Norm (DIRSN)</td>
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<td>-1.3 (1.5)**</td>
<td>-2.9 (0.6)</td>
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<td>PBC</td>
<td>71.3 (30.8)</td>
<td>43.8 (18.9)**</td>
<td>88.9 (14.8)</td>
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<td>INEFF</td>
<td>1.1 (2.4)</td>
<td>0.5 (1.0)**</td>
<td>1.1 (2.5)</td>
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<td>ASHM</td>
<td>3.6 (0.6)</td>
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<td>3.7 (0.5)</td>
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<td>2.4 (0.7)</td>
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<td>3.0 (0.0)**</td>
<td>2.1 (0.7)</td>
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<td>GIMP</td>
<td>73.3 (22.7)</td>
<td>85.8 (13.4)</td>
<td>72.4 (21.0)</td>
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***p < .001; **p < .01; *p < .05

Table 1b
Means and Standard Deviations for Selected Characteristics of Adolescent Subsample
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<th>Variable</th>
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<th>4</th>
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<tr>
<td>1. ASINT</td>
<td></td>
<td></td>
<td></td>
<td>.74 ***</td>
<td>.45 ***</td>
<td>.48 ***</td>
<td>.35 ***</td>
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<tr>
<td>2. DIRATT</td>
<td></td>
<td></td>
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<td>.43 ***</td>
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<tr>
<td>3. INDIRATT</td>
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<td></td>
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<td>.50 ***</td>
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<td>4. DIRSN</td>
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<td>.52 ***</td>
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<td>5. INDIRSN</td>
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<td></td>
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<tr>
<td>6. PBC (Perceived Behavioral Control)</td>
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<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* **p < .001; * **p < .01; * p < .05

*Pearson correlations

†Number of independent periods of AAS use ("cycles") by the respondent (i.e., past use)

Note: Due to the large number of comparisons, correlations at p < .05 should be interpreted with caution

Table 2a
Zero-Order Correlations* Among TRA Constructs and Other Variables for the Total Sample (n = 103)

<table>
<thead>
<tr>
<th>Variable</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. ASINT</td>
<td></td>
<td></td>
<td></td>
<td>.75 ***</td>
<td>.59 ***</td>
<td>.57 ***</td>
<td>.28 *</td>
</tr>
<tr>
<td>2. DIRATT</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>.50 ***</td>
<td>.56 ***</td>
<td>.15</td>
</tr>
<tr>
<td>3. INDIRATT</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>.47 ***</td>
<td>.38 **</td>
</tr>
<tr>
<td>4. DIRSN</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>.27</td>
</tr>
<tr>
<td>5. INDIRSN</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. PBC (Perceived Behavioral Control)</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>7. INEFF (Ineffectiveness)</td>
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<td></td>
</tr>
</tbody>
</table>

* **p < .001; * **p < .01; * p < .05

Table 2b
Zero-Order Correlations* Among TRA Constructs and Other Variables for the Adolescent Subsample (n = 59)
### Table 3a
Summary of Hierarchical Regression Analysis for Prediction of Intention to Use AAS in the Total Sample

<table>
<thead>
<tr>
<th>Variables in Model</th>
<th>b</th>
<th>Beta</th>
<th>R²</th>
<th>Change in R²</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1</strong></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>DIRATT</td>
<td>.79</td>
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<tr>
<td>DIRSN</td>
<td>.06</td>
<td>.03</td>
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</tr>
<tr>
<td>Total</td>
<td>.55</td>
<td>.55</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Step 2</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DIRATT</td>
<td>.59</td>
<td>.54***</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DIRSN</td>
<td>.12</td>
<td>.07</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PBC</td>
<td>-.03</td>
<td>-.37***</td>
<td>.66</td>
<td>.11&quot;</td>
</tr>
<tr>
<td><strong>Step 3</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DIRATT</td>
<td>.54</td>
<td>.50***</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DIRSN</td>
<td>.19</td>
<td>.11</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PBC</td>
<td>-.03</td>
<td>-.36***</td>
<td></td>
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<tr>
<td>INEFF</td>
<td>.09</td>
<td>.14</td>
<td>.68</td>
<td>.02&quot;</td>
</tr>
</tbody>
</table>

*p < .001; **p < .01; *p < .05

*NCYC and Perceived Strength did not enter into the model as significant predictors of ASINT

---

### Table 3b
Summary of Hierarchical Regression Analysis for Prediction of Intention to Use AAS in the Adolescent Sub-Sample

<table>
<thead>
<tr>
<th>Variables in Model</th>
<th>b</th>
<th>Beta</th>
<th>R²</th>
<th>Change in R²</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DIRATT</td>
<td>.64</td>
<td>.63***</td>
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<td></td>
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<tr>
<td>DIRSN</td>
<td>.37</td>
<td>.21*</td>
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<td></td>
</tr>
<tr>
<td>Total</td>
<td>.59</td>
<td>.59</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Step 2</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DIRATT</td>
<td>.47</td>
<td>.47***</td>
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<td></td>
</tr>
<tr>
<td>DIRSN</td>
<td>.33</td>
<td>.19*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PBC</td>
<td>-.02</td>
<td>-.33***</td>
<td>.67</td>
<td>.08&quot;</td>
</tr>
<tr>
<td><strong>Step 3</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DIRATT</td>
<td>.47</td>
<td>.47***</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DIRSN</td>
<td>.33</td>
<td>.19*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PBC</td>
<td>-.02</td>
<td>-.33***</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>.67</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*p < .001; **p < .01; *p < .05

b NCYC, Perceived Strength, and INEFF did not enter into the model as significant predictors of ASINT
### Belief (perceived consequence)

<table>
<thead>
<tr>
<th>Belief</th>
<th>Likely-Unlikely (INT)</th>
<th>NON-INT</th>
<th>Good-Bad (INT)</th>
<th>NON-INT</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Make me have a hormonal imbalance</td>
<td>2.11</td>
<td>1.60</td>
<td>-1.80</td>
<td>-1.88</td>
</tr>
<tr>
<td>2. Make me get cancer</td>
<td>-1.89***</td>
<td>0.49</td>
<td>-3.00</td>
<td>-2.78</td>
</tr>
<tr>
<td>3. Help me recover better from my workouts</td>
<td>2.78**</td>
<td>0.86</td>
<td>2.56</td>
<td>2.26</td>
</tr>
<tr>
<td>4. Allow me to make rapid gains in strength</td>
<td>2.67</td>
<td>2.17</td>
<td>2.44</td>
<td>2.01</td>
</tr>
<tr>
<td>5. Make me become aggressive</td>
<td>1.00*</td>
<td>1.97</td>
<td>0.89</td>
<td>0.51</td>
</tr>
<tr>
<td>6. Allow me to have increased speed</td>
<td>0.33*</td>
<td>1.47</td>
<td>1.33</td>
<td>1.35</td>
</tr>
<tr>
<td>7. Cause me to fail a drug test</td>
<td>0.44*</td>
<td>2.02</td>
<td>-1.67</td>
<td>-2.45</td>
</tr>
<tr>
<td>8. Allow me to have greater muscularity (muscle definition)</td>
<td>1.89</td>
<td>2.06</td>
<td>2.67</td>
<td>2.27</td>
</tr>
<tr>
<td>9. Make me become sterile</td>
<td>-0.58*</td>
<td>0.79</td>
<td>-1.89</td>
<td>-2.02</td>
</tr>
<tr>
<td>10. Allow me to make rapid gains in size</td>
<td>2.56</td>
<td>2.17</td>
<td>2.22</td>
<td>1.55</td>
</tr>
<tr>
<td>11. Make me get acne</td>
<td>0.78</td>
<td>1.61</td>
<td>-0.78***</td>
<td>-2.67</td>
</tr>
<tr>
<td>12. Make me have mood swings</td>
<td>1.11</td>
<td>1.78</td>
<td>-1.89</td>
<td>-2.29</td>
</tr>
<tr>
<td>13. Allow me to train with increased intensity</td>
<td>2.56</td>
<td>2.31</td>
<td>2.33</td>
<td>1.30</td>
</tr>
<tr>
<td>14. Allow me to have an improved appearance</td>
<td>2.33</td>
<td>1.26</td>
<td>2.56</td>
<td>2.37</td>
</tr>
<tr>
<td>15. Make me irritable</td>
<td>1.11</td>
<td>1.87</td>
<td>-1.11*</td>
<td>-2.22</td>
</tr>
<tr>
<td>16. Cause me to retain water</td>
<td>1.00</td>
<td>1.51</td>
<td>-0.89</td>
<td>-1.73</td>
</tr>
<tr>
<td>17. Allow me to have increased athletic performance</td>
<td>1.89</td>
<td>2.03</td>
<td>2.00</td>
<td>2.11</td>
</tr>
<tr>
<td>18. Make me get shrunken testicles</td>
<td>1.11</td>
<td>1.24</td>
<td>-1.56***</td>
<td>-2.71</td>
</tr>
<tr>
<td>19. Make me get liver damage</td>
<td>-1.00***</td>
<td>1.01</td>
<td>-2.78</td>
<td>-2.84</td>
</tr>
<tr>
<td>20. Be illegal</td>
<td>3.00</td>
<td>2.48</td>
<td>-0.56***</td>
<td>-2.17</td>
</tr>
<tr>
<td>21. Cost me a lot of money</td>
<td>1.56</td>
<td>2.36</td>
<td>-1.44*</td>
<td>-2.39</td>
</tr>
<tr>
<td>22. Make me become addicted to anabolic steroids</td>
<td>-1.56**</td>
<td>0.39</td>
<td>-2.00***</td>
<td>-2.89</td>
</tr>
</tbody>
</table>

***p<.001; **p<.01; *p<.05

*INT: n=9  
NON-INT: n=94  
The 7-point scale ranged from -3 to 3  
Note: Due to large number of comparisons, correlations at p<.05 should be interpreted with caution

### Table 4a
Mean Scores on Beliefs and Belief Evaluations for Respondents in Total Sample Who Intended* and Did Not Intend* to Use AAS

<table>
<thead>
<tr>
<th>Referent</th>
<th>Normative Belief*</th>
<th>Motivation to Comply*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>INT</td>
<td>NON-INT</td>
</tr>
<tr>
<td>1. Parents</td>
<td>-2.4*</td>
<td>-2.9</td>
</tr>
<tr>
<td>2. Friends</td>
<td>0.1***</td>
<td>-2.1</td>
</tr>
<tr>
<td>3. Girlfriend</td>
<td>-1.7*</td>
<td>-2.7</td>
</tr>
<tr>
<td>4. Boss</td>
<td>-1.6*</td>
<td>-2.5</td>
</tr>
<tr>
<td>5. Family</td>
<td>-2.4</td>
<td>-2.7</td>
</tr>
</tbody>
</table>

***p<.001; **p<.01; *p<.05

*INT: n=9  
NON-INT: n=94  
Belief that referent thinks respondent should (should not) use AAS; The 7-point scale ranged from -3 to 3
Belief that referent thinks respondent should (should not) use AAS; The 7-point scale ranged from -3 to 3

### Table 4b
Mean Score on Normative Beliefs and Motivation To Comply Scores for Respondents in Total Sample Who Intended* and Did Not Intend* to Use AAS

54
**My using anabolic steroids sometime over the next 12 months would...**

Belief (perceived consequence)  | Belief Strength*  | Evaluation Score*  
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(Likely-Unlikely)</td>
<td>(Good-Bad)</td>
</tr>
<tr>
<td></td>
<td>INT</td>
<td>NON-INT</td>
</tr>
<tr>
<td>1. Make me have a hormonal imbalance</td>
<td>2.4</td>
<td>2.6</td>
</tr>
<tr>
<td>2. Make me get cancer</td>
<td>-1.00</td>
<td>0.64</td>
</tr>
<tr>
<td>3. Help me recover better from my workouts</td>
<td>3.00</td>
<td>0.85</td>
</tr>
<tr>
<td>4. Allow me to make rapid gains in strength</td>
<td>3.00</td>
<td>2.04</td>
</tr>
<tr>
<td>5. Make me become aggressive</td>
<td>1.55</td>
<td>1.93</td>
</tr>
<tr>
<td>6. Allow me to have increased speed</td>
<td>2.25</td>
<td>1.50</td>
</tr>
<tr>
<td>7. Cause me to fail a drug test</td>
<td>1.00</td>
<td>2.40</td>
</tr>
<tr>
<td>8. Allow me to have greater muscularity (muscle definition)</td>
<td>2.25</td>
<td>2.13</td>
</tr>
<tr>
<td>9. Make me become sterile</td>
<td>-1.00</td>
<td>1.07</td>
</tr>
<tr>
<td>10. Allow me to make rapid gains in size</td>
<td>3.00</td>
<td>2.15</td>
</tr>
<tr>
<td>11. Make me get acne</td>
<td>0.50</td>
<td>1.78</td>
</tr>
<tr>
<td>12. Make me have mood swings</td>
<td>1.25</td>
<td>1.82</td>
</tr>
<tr>
<td>13. Allow me to train with increased intensity</td>
<td>2.75</td>
<td>2.25</td>
</tr>
<tr>
<td>14. Allow me to make an improved appearance</td>
<td>2.75</td>
<td>1.00</td>
</tr>
<tr>
<td>15. Make me irritable</td>
<td>1.00</td>
<td>1.80</td>
</tr>
<tr>
<td>16. Cause me to retain water</td>
<td>0.25</td>
<td>1.35</td>
</tr>
<tr>
<td>17. Allow me to have increased athletic performance</td>
<td>2.75</td>
<td>1.98</td>
</tr>
<tr>
<td>18. Make me get shrunkn testicles</td>
<td>0.75</td>
<td>1.51</td>
</tr>
<tr>
<td>19. Make me get liver damage</td>
<td>-0.50</td>
<td>1.27</td>
</tr>
<tr>
<td>20. Be illegal</td>
<td>3.00</td>
<td>2.56</td>
</tr>
<tr>
<td>21. Cost me a lot of money</td>
<td>2.25</td>
<td>2.50</td>
</tr>
<tr>
<td>22. Make me become addicted to anabolic steroids</td>
<td>-1.25</td>
<td>0.75</td>
</tr>
</tbody>
</table>

*INT: n = 4  
**NON-INT: n = 55  
*The 7-point scale ranged from -3 to 3  
Note: Due to large number of comparisons, correlations at p < .05 should be interpreted with caution

### Table 5a

Mean Scores on Beliefs and Belief Evaluations for Respondents in Adolescent Subsample Who Intended* and Did Not Intend* to Use AAS

<table>
<thead>
<tr>
<th>Referent</th>
<th>Normative Belief*</th>
<th>Motivation to Comply*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(Likely-Unlikely)</td>
<td>(Likely-Unlikely)</td>
</tr>
<tr>
<td></td>
<td>INT</td>
<td>NON-INT</td>
</tr>
<tr>
<td>1. Parents</td>
<td>-3.00</td>
<td>-2.95</td>
</tr>
<tr>
<td>2. Friends</td>
<td>-0.25</td>
<td>-2.22</td>
</tr>
<tr>
<td>3. Girlfriend</td>
<td>-2.00</td>
<td>-2.78</td>
</tr>
<tr>
<td>4. Boss</td>
<td>-0.75</td>
<td>-2.50</td>
</tr>
<tr>
<td>5. Family</td>
<td>-2.75</td>
<td>-2.78</td>
</tr>
</tbody>
</table>

*INT: n = 4  
**NON-INT: n = 55  
*The 7-point scale ranged from -3 to 3  
*The 7-point scale ranged from 1 to 7

### Table 5b

Mean Score on Normative Beliefs and Motivation To Comply Scores for Respondents in Adolescent Subsample Who Intended* and Did Not Intend* to Use AAS
<table>
<thead>
<tr>
<th>Variable</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. NDRK*</td>
<td>—</td>
<td>-.26*</td>
<td>-.38***</td>
<td>-.16</td>
<td>-.16</td>
<td>-.19</td>
<td>.04</td>
<td>.14</td>
<td>.13</td>
<td>3.48</td>
<td>1.89</td>
</tr>
<tr>
<td>2. MDRK*</td>
<td>—</td>
<td>.32***</td>
<td>.22***</td>
<td>.28***</td>
<td>.30***</td>
<td>.08</td>
<td>-.06</td>
<td>.06</td>
<td>8.65</td>
<td>6.90</td>
<td></td>
</tr>
<tr>
<td>3. DRNK*</td>
<td>—</td>
<td>.31***</td>
<td>.32***</td>
<td>.36***</td>
<td>-.01</td>
<td>-.07</td>
<td>-.08</td>
<td>3.08</td>
<td>4.56</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. NSMK*</td>
<td>—</td>
<td>.39***</td>
<td>.08</td>
<td>.10</td>
<td>-.07</td>
<td>-.07</td>
<td>0.36</td>
<td>1.03</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. NCHW*</td>
<td>—</td>
<td>.23</td>
<td>-.07</td>
<td>.14</td>
<td>.13</td>
<td>1.18</td>
<td>2.58</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. NPO1*</td>
<td>—</td>
<td>.00</td>
<td>.14</td>
<td>.14</td>
<td>2.03</td>
<td>3.10</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. NCOX*</td>
<td>—</td>
<td>.15</td>
<td>.16</td>
<td>.16</td>
<td>0.16</td>
<td>1.11</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. NAAS*</td>
<td>—</td>
<td>.89***</td>
<td>.43</td>
<td>1.13</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
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<td>9. NCYC*</td>
<td>—</td>
<td>.46</td>
<td>1.20</td>
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<td></td>
</tr>
</tbody>
</table>

**g < .001; **g < .01; *g < .05**

Note: Due to large number of comparisons, correlations at g < .05 should be interpreted with caution

*Frequency of alcohol consumption over past 12 months
*Most alcoholic drinks consumed in any one day over the past 30 days
*Number of times drunk in a typical month
*Frequency of smoking cigarettes over the past 12 months
*Frequency of chewing tobacco over the past 12 months
*Frequency of marijuana use over the past 12 months
*Frequency of cocaine use over the past 12 months
*Number of AAS used by respondent
Number of independent periods of AAS use ("cycles") by respondent

Drug use was coded as follows: 0 = Daily use; 1 = Almost daily use (3-6 days a week); 2 = use 1 or 2 days a week; 3 = use several times a month (26-61 days a year); 4 = use 1 or 2 times a month (12-24 days a year); 5 = Every other month or no 16-21 days a year); 6 = use 3-6 days this past year; 7 = use 1 or 2 days this past year. 0 = No drug use in past 12 months.

Table 8a
Means, Standard Deviations, and Spearman’s Rank Correlations Among Drug Use Variables in Total Sample (N = 103)

<table>
<thead>
<tr>
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**g < .001; **g < .01; *g < .05**

Table 8b
Means, Standard Deviations, and Spearman’s Rank Correlations Among Drug Use Variables in Adolescent Sub-Sample (N = 58)
Figure 1

ASSNT = Intention
DIRSN = Direct measure of social norm
DIRATT = Direct measure of attitude
Figure 2

The Theory of Planned Behavior

\[ \text{AINT} \rightarrow \text{PBC} \]

\[ \text{DIHRN} \rightarrow \text{DIRATT} \]

AINT = Intention

DIHRN = Direct measure of social norm

DIRATT = Direct measure of attitude

PBC = Perceived behavioral control

58
Figure 3a

TR A Model to Explain the Intention to Use AIDS in the Total Sample

- AS INT = Intention to use amnolyte strips
- DIRSN = Direct measure of social norm
- DIRATT = Direct measure of attitude

Note: Numbers represent standardized path coefficients (i.e., Beta weights)
TRA Model to Explain the Intention to Use AAS in the Adolescent Sub-Sample

Figure 3b

ASINT = Intention to use andabolic steroids
DRSN = Direct measure of social norm
DRATT = Direct measure of attitude

Note: Numbers represent standardized path coefficients (i.e., beta weights).
TPB Model to Explain the Intention to Use AAS in the Total Sample

Figure 4a

Note: Numbers represent standardized path coefficients (i.e., beta weights)

ASINT = Intention to use mobile Sheldon
DIRSN = Direct measure of social norm
DIRATT = Direct measure of attitude
PBC = Perceived behavioral control

ASINT

DIRSN

...0.7

DIRATT

...5.4

PBC

...3.7
TPB Model to Explain the Intention to Use AAS in the Adolescent Sub-Sample

Figure 4b

$	ext{ASSNT} = 	ext{Intention to use anabolic steroids}$
$	ext{DRSN} = 	ext{Direct measure of social norm}$
$	ext{DRAT} = 	ext{Direct measure of attitude}$
$	ext{PBC} = 	ext{Perceived behavioral control}$

Note: Numbers represent standardized path coefficients (i.e., Beta weights)
Appendix A

Pilot (Elicitation) Study

Using an open-ended questionnaire (Appendix C), 25 participants were asked to record the perceived positive and negative consequences of AAS use (for themselves) and the various individuals or groups who might be influential in their decision to use AAS. To participate in the elicitation study, respondents had to meet the criteria required for inclusion in the final study. Based on content analysis (Ajzen & Fishbein, 1980), 22 consequences of AAS use (10 positive and 12 negative) and the 5 most common referents were identified and included in the final questionnaire in random order (Appendix D). To meet inclusion criteria, a belief or referent must have been reported by at least 20% of the pilot sample.
Appendix B

Statement of Informed Consent

Purpose:
The purpose of this study is to investigate what people think about anabolic steroids and why some people use them.

Procedure:
To accomplish the goals of this study, you are asked to spend about 20 minutes and fill out an anonymous questionnaire. You will be asked a variety of questions related to anabolic steroids and other health behaviors.

Anonymity of Subjects and Confidentiality of Results:
This study is anonymous. Thus, your name will never be attached to your answers in any way. Moreover, the results of this study will be kept strictly confidential.

Risks From Participation and Expected Benefits:
Anonymous questionnaires of this type have been used on a local, state, and national level to investigate many health-risk and drug behaviors with no adverse consequences to the participants. In terms of benefits, this information is essential for the development of health education programs.

Freedom to Withdraw:
Participation is voluntary and you are free to withdraw from completing the survey at anytime.

Compensation:
For participating in this study, you will receive a free Powerbar upon signing this consent form.

Use of Research Data:
All data that is collected in this study will be used for scientific and educational purposes. It may be presented at scientific meetings and/or published and reproduced in professional journals or books, or used for any purpose that Virginia Tech's Department of Psychology deems proper in the interest of education, knowledge, or research.

Approval of Research:
This research project has been approved by the Human Subjects Committee of the Department of Psychology and by the Institutional Review Board of Virginia Tech.

Subject's Permission:
I have read and understand the above description of the study. I hereby acknowledge the above and give my voluntary consent to participate in this study. I further understand that if I participate I may withdraw at any time without penalty. I understand that if I should have any questions regarding this research and its conduct, I should contact any of the persons named below.

Primary Researcher: Daniel I. Galper Phone: (703) 951-2641
Faculty Advisor: Richard A. Winett, Ph.D. Phone: (703) 231-8747
Chair, HSC: Robert J. Harvey, Ph.D. Phone: (703) 231-7030
Provost, IRB: Ernest R. Stout, Ph.D. Phone: (703) 231-9359

Subject's Signature: ___________________________

Date: ______________
Appendix C
Elicitation Questionnaire

1) What are the advantages of your using anabolic steroids? (List below):

2) What are the disadvantages of your using anabolic steroids? (List below)

3) Who would approve of your using anabolic steroids? (List below)

4) Who would disapprove of your using anabolic steroids? (List below)

5) What else do you associate with anabolic steroid use? (List below)
Appendix D

Final Questionnaire

Thank you for taking the time to participate in this study on weightlifters. You will be asked to respond to questions about your opinions, attitudes, and health behaviors. The information you provide will be used for educational purposes, so please be honest. Remember, your answers on this questionnaire are completely anonymous so please do not write your name on any of the materials. It is important that you answer all questions. However, if you find that you absolutely cannot be truthful on a question, please leave it blank and move on to the next question.

Please read each question carefully. Do your best to pick the answer which is true for you and circle the appropriate letter or write your response in the adjacent blank space. Remember this is an anonymous questionnaire so no one will know who you are. Also please remember that your honesty is very important.

EXAMPLE:
a) Gender
   A. Male
   B. Female

AGE (1) How old are you (in years) ? ______

RACE (2) Race
   A. White
   B. Black
   C. Hispanic
   D. Asian
   E. Other

ST (3) What is your home state (e.g., Virginia, California) ? __________

EDS (4) a) How many years of college have you completed ?
NSDY b) On average, how many hours per day do you spend studying ? ______

EDF (5) What is the highest level of education completed by your father ?
   A. Junior high school
   B. Some high school
   C. High school Graduate or GED
   D. Some college or specialized training
   E. College Graduate
   F. Some graduate school
   G. Graduate degree (e.g., M.A., Ph.D., etc)
   H. I don’t know

NLWT (6) On average how many times per week do you lift weights (If you lift weights more than once per day count each session separately) ? ______

VLWT (7) Why did you start lifting weights ? __________

YRLW (8) For how many years have you been lifting weights ? ______

OS (9) a) Do you actively participate in any sports ?
   A. Yes
   B. No

TYOS b) If Yes, which ones ? __________________

NOS c) How many days per week (on average) ? ______

66
ZZZ (10) On average, how many hours of sleep do you get per night? _______

STR (11) Compared to other weightlifters my age, my strength is:
A. Below average
B. About average
C. Greater than average

HLTH (12) Compared to other weightlifters my age, my overall health is:
A. Poor
B. Fair
C. Good
D. Very good
E. Excellent

DIET (13) Compared to other weightlifters my age, my dietary habits are:
A. Poor
B. Fair
C. Good
D. Very good
E. Excellent

NBBS (14) a) Have you ever used any bodybuilding supplements?
A. Yes
B. No

BBSN b) If you have used any body building, which ones (please list):

VMS (15) Do you currently take any vitamin or mineral supplements?
A. Yes
B. No

NVMS (16) If you currently take any vitamin or mineral supplements, which ones (please list):

FSMK (17) When did you first smoke a cigarette?
A. before age 10
B. 10-11
C. 12-17
D. 18-25
E. 26 or older
F. I never have

NSMK (18) On average, how many cigarettes have you smoked per day during the past 30 days?
A. 1-5 cigarettes
B. About 1/2 pack (6-15)
C. About 1 pack (16-25)
D. About 1.5 packs (26-35)
E. About 2 packs or more (over 35 cigarettes)
F. Less than one cigarette per day (circle this response if you have not smoked)
RSMK (19) a) When was the most recent time you smoked a cigarette?
   A. Within the past month (30 days)
   B. More than one month ago, but less than 6 months ago
   C. 6 or more months ago, but less than 1 year ago
   D. 1 or more years ago, but less than 3 years ago
   E. 3 or more years ago
   F. I have not smoked a cigarette in over three years
   G. I never have smoked a cigarette

PSMK b) At the time when you last smoked a cigarette, about many cigarettes did you smoke on a typical day?
   A. 1-5 cigarettes
   B. About 1/2 pack (6-15)
   C. About 1 pack (16-25)
   D. About 1.5 packs (26-35)
   E. About 2 packs or more (over 35 cigarettes)
   F. Less than one cigarette per day (circle this response if you have not smoked)

FDRK (20) When did you first drink a full glass (or can) of beer, wine, or other alcoholic drink?
   A. before age 10
   B. 10-11
   C. 12-17
   D. 18-25
   E. 26 or older
   F. I never have

NDRK (21) On average, how often in the last 12 months have you had any alcoholic beverage?
   A. Daily
   B. Almost daily (3-6 days a week)
   C. 1 or 2 days a week
   D. Several times a month (25-51 days a year)
   E. 1 or 2 times a month (12-24 days a year)
   F. Every other month or so (6-11 days a year)
   G. 3-5 days this past year
   H. 1 or 2 days this past year
   I. I did not drink in the past 12 months
   J. I have never had an alcoholic drink

NDRK (22) What is the most number of alcoholic drinks (e.g., beer, wine, or mixed drinks) you have had on any one day during the past 30 days? _________

DRNK (23) During a typical month, how many times do you get drunk? _________

CAGE1 (24) Have you ever felt you ought to cut down on your drinking?
   A. Yes
   B. No

CAGE2 (25) Have people annoyed you by criticizing your drinking?
   A. Yes
   B. No

CAGE3 (26) Have you ever felt bad or guilty about your drinking?
   A. Yes
   B. No
CAGE4 (27) Have you ever had a drink first thing in the morning to steady yourself or to get rid of a hangover?
A. Yes
B. No

FCHW (28) When did you first use chewing tobacco?
A. Before age 10
B. 10-11
C. 12-17
D. 18-25
E. 26 or older
F. I never have

MCHW (29) On average, in the past 12 months, how often have you used chewing tobacco?
A. Daily
B. Almost daily (3-6 days a week)
C. 1 or 2 days a week
D. Several times a month (25-51 days a year)
E. 1 or 2 times a month (12-24 days a year)
F. Every other month or so (6-11 days a year)
G. 3-5 days this past year
H. 1 or 2 days this past year
I. I have not used chewing tobacco in the past 12 months
J. I have never used chewing tobacco

FPOT (30) When did you first use marijuana (any form)?
A. Before age 10
B. 10-11
C. 12-17
D. 18-25
E. 26 or older
F. I never have

NPOT (31) On average, how often in the past 12 months have you used marijuana (any form)?
A. Daily
B. Almost daily (3-6 days a week)
C. 1 or 2 days a week
D. Several times a month (25-51 days a year)
E. 1 or 2 times a month (12-24 days a year)
F. Every other month or so (6-11 days a year)
G. 3-5 days this past year
H. 1 or 2 days this past year
I. I have not used any form of marijuana in the past year
J. I have never used marijuana in any form

FCOK (32) When did you first use cocaine (any form)?
A. Before age 10
B. 10-11
C. 12-17
D. 18-24
E. 26 or older
F. I never have
NCOX (33) On average, how often in the past 12 months have you used cocaine (any form)?
A. Daily
B. Almost daily (3-6 days a week)
C. 1 or 2 days a week
D. Several times a month (25-51 days a year)
E. 1 or 2 times a month (12-24 days a year)
F. Every other month or so (6-11 days a year)
G. 3-5 days this past year
H. 1 or 2 days this past year
I. I have not used any form of cocaine in the past year
J. I have never used cocaine in any form

FAAS (34) When did you first use anabolic steroids or testosterone?
A. Before age 10
B. 10-11
C. 12-17
D. 18-25
E. 26 or older
F. I never have used anabolic steroids

NAAS (35) How many different anabolic steroids have you tried (including testosterone)?
A. 1
B. 2
C. 3
D. 4
E. 5 or more
F. I never have tried anabolic steroids

NCYC (36) How many "cycles" (independent periods of use) of anabolic steroids (including testosterone) have you done?
A. 1
B. 2
C. 3
D. 4
E. 5 or more
F. I never have used anabolic steroids

WOAS (37) What is the longest period of time you have used anabolic steroids or testosterone without a break of at least 1 month?
A. Less than 4 weeks
B. 4-6 weeks
C. 7-8 weeks
D. 9-12 weeks
E. 13-16 weeks
F. More than 16 weeks
G. I never have used anabolic steroids or testosterone

ASLB (38) If you have ever used anabolic steroids, how much muscle have you gained since you began using steroids (write a number of pounds)? Leave this question blank if you have never used anabolic steroids or testosterone.

AVL1 (39) How difficult do you think it would be for you to get anabolic steroids or testosterone if you wanted some?
A. Probably impossible
B. Very difficult
C. Fairly difficult
D. Fairly easy
E. Very easy
WLGL (40) My primary weight lifting goal is for the next 12 months

is: ____________________________

a) At this moment how important is it that you achieve your stated goal (how hard are
you willing to work to achieve your goal)? Answer this question by writing a
number from 0 (not important at all) to 100 (the most important thing in my life)
in the designated space below.

GIMP Write your goal importance rating (0-100) here:_____

b) In the designated space below, indicate how confident you feel at this moment that
you will achieve your stated goal without the use of anabolic steroids. In other
words, indicate the probability that you can achieve your goal without using steroids
by writing a number from 0 (not at all confident that I will achieve my goal without
steroids) to 100 (totally confident that I will achieve my goal without steroids) in
the designated space below.

PBC Write your confidence rating (0-100%) here:_____%

(41) In the designated space, write a number (0-100%) which indicates how confident you
feel that you could resist the urge to use steroids if...

SE1 A. I planned to compete in bodybuilding or powerlifting (0-100%): ________%
SE2 B. I was training hard but making few gains in size or strength (0-100%): ________%
SE3 C. most of my friends used anabolic steroids (0-100%): ________%
SE4 D. it were proven that steroids were not dangerous (0-100%): ________%

For each question below, circle the number on the 7-point rating scale which corresponds to
what you think or how you feel. There are no right or wrong answers. Just give the answer
that is most accurate for you.

ASINT (1) My using anabolic steroids sometime over the next 12 months is:

Likely 3 2 1 0 -1 -2 -3

Unlikely

DIRATT (2) My using anabolic steroids sometime over the next 12 months is:

Foolish 3 2 1 0 -1 -2 -3

Wise

Good

Rewarding 3 2 1 0 -1 -2 -3

Bad

Punishing

DIRSN (3) Most people who are important to me think I should

1 should 3 2 1 0 -1 -2 -3

I should not

use anabolic steroids sometime over the next 12 months.

MC (4) Generally speaking, how much do you want to do what other important people in your
life think you should do?

Not At All -3 -2 -1 0 1 2 3

Very Much
NB1 (5) My parents think
\[ \text{I should} \quad 3 \quad 2 \quad 1 \quad 0 \quad -1 \quad -2 \quad -3 \quad \text{I should not} \quad 3 \quad 2 \quad 1 \quad 0 \quad -1 \quad -2 \quad -3 \]
use anabolic steroids sometime over the next 12 months.

NB2 (6) My friends think
\[ \text{I should} \quad 3 \quad 2 \quad 1 \quad 0 \quad -1 \quad -2 \quad -3 \quad \text{I should not} \quad 3 \quad 2 \quad 1 \quad 0 \quad -1 \quad -2 \quad -3 \]
use anabolic steroids sometime over the next 12 months.

NB3 (7) My girlfriend thinks
\[ \text{I should} \quad 3 \quad 2 \quad 1 \quad 0 \quad -1 \quad -2 \quad -3 \quad \text{I should not} \quad 3 \quad 2 \quad 1 \quad 0 \quad -1 \quad -2 \quad -3 \]
use anabolic steroids sometime over the next 12 months.

NB4 (8) My boss thinks
\[ \text{I should} \quad 3 \quad 2 \quad 1 \quad 0 \quad -1 \quad -2 \quad -3 \quad \text{I should not} \quad 3 \quad 2 \quad 1 \quad 0 \quad -1 \quad -2 \quad -3 \]
use anabolic steroids sometime over the next 12 months.

NB5 (9) My family thinks
\[ \text{I should} \quad 3 \quad 2 \quad 1 \quad 0 \quad -1 \quad -2 \quad -3 \quad \text{I should not} \quad 3 \quad 2 \quad 1 \quad 0 \quad -1 \quad -2 \quad -3 \]
use anabolic steroids sometime over the next 12 months.

MC1 (10) Generally speaking, how much do you want to do what your parents think you should do?
\[ \text{Not At All} \quad -3 \quad -2 \quad -1 \quad 0 \quad 1 \quad 2 \quad \text{Very Much} \quad 3 \]

MC2 (11) Generally speaking, how much do you want to do what your friends think you should do?
\[ \text{Not At All} \quad -3 \quad -2 \quad -1 \quad 0 \quad 1 \quad 2 \quad \text{Very Much} \quad 3 \]

MC3 (12) Generally speaking, how much do you want to do what your girlfriend thinks you should do?
\[ \text{Not At All} \quad -3 \quad -2 \quad -1 \quad 0 \quad 1 \quad 2 \quad \text{Very Much} \quad 3 \]

MC4 (13) Generally speaking, how much do you want to do what your boss thinks you should do?
\[ \text{Not At All} \quad -3 \quad -2 \quad -1 \quad 0 \quad 1 \quad 2 \quad \text{Very Much} \quad 3 \]

MC5 (14) Generally speaking, how much do you want to do what your family thinks you should do?
\[ \text{Not At All} \quad -3 \quad -2 \quad -1 \quad 0 \quad 1 \quad 2 \quad \text{Very Much} \quad 3 \]

OV1 (15) My having a hormonal imbalance is
Good \quad 3 \quad 2 \quad 1 \quad 0 \quad -1 \quad -2 \quad -3 \quad \text{Bad}

OV2 (16) My getting cancer is
Good \quad 3 \quad 2 \quad 1 \quad 0 \quad -1 \quad -2 \quad -3 \quad \text{Bad}
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<tr>
<td></td>
<td>Good</td>
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<tr>
<td>OV</td>
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<td>Good</td>
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<tr>
<td>OV</td>
<td>(19) My being aggressive is</td>
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<td>Good</td>
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<td>OV</td>
<td>(20) My having increased speed is</td>
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<td>Good</td>
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<td>OV</td>
<td>(21) My failing a drug test is</td>
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<td>Good</td>
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<td>OV</td>
<td>(22) My having greater muscularity (muscle definition) is</td>
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<td>Good</td>
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<td>OV</td>
<td>(23) My becoming sterile is</td>
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<td>Good</td>
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<tr>
<td>OV</td>
<td>(24) My making rapid gains in size is</td>
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<td></td>
<td>Good</td>
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<tr>
<td>OV</td>
<td>(25) My getting acne is</td>
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<td>Good</td>
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<td>(26) My having mood swings is</td>
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<td>Good</td>
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<td>OV</td>
<td>(28) My having an improved appearance is</td>
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<td>Good</td>
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<tr>
<td>OV</td>
<td>(29) My being irritable is</td>
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<td>3 2 1 0</td>
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<td>Bad</td>
</tr>
<tr>
<td></td>
<td>-3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>OV19</th>
<th>(33) My getting liver damage is</th>
</tr>
</thead>
<tbody>
<tr>
<td>Good</td>
<td>3 2 1 0</td>
</tr>
<tr>
<td></td>
<td>-1 -2</td>
</tr>
<tr>
<td></td>
<td>Bad</td>
</tr>
<tr>
<td></td>
<td>-3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>OV20</th>
<th>(34) My breaking the law is</th>
</tr>
</thead>
<tbody>
<tr>
<td>Good</td>
<td>3 2 1 0</td>
</tr>
<tr>
<td></td>
<td>66X -1 -2</td>
</tr>
<tr>
<td></td>
<td>Bad</td>
</tr>
<tr>
<td></td>
<td>-3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>OV21</th>
<th>(35) Costing me a lot of money is</th>
</tr>
</thead>
<tbody>
<tr>
<td>Good</td>
<td>3 2 1 0</td>
</tr>
<tr>
<td></td>
<td>-1 -2</td>
</tr>
<tr>
<td></td>
<td>Bad</td>
</tr>
<tr>
<td></td>
<td>-3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>OV22</th>
<th>(36) My becoming addicted to anabolic steroids is</th>
</tr>
</thead>
<tbody>
<tr>
<td>Good</td>
<td>3 2 1 0</td>
</tr>
<tr>
<td></td>
<td>-1 -2</td>
</tr>
<tr>
<td></td>
<td>Bad</td>
</tr>
<tr>
<td></td>
<td>-3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>OE1</th>
<th>(37) My using anabolic steroids sometime over the next 12 months would make me have a hormonal imbalance.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Likely</td>
<td>3 2 1 0</td>
</tr>
<tr>
<td></td>
<td>-1 -2</td>
</tr>
<tr>
<td></td>
<td>Unlikely</td>
</tr>
<tr>
<td></td>
<td>-3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>OE2</th>
<th>(38) My using anabolic steroids sometime over the next 12 months would make me get cancer.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Likely</td>
<td>3 2 1 0</td>
</tr>
<tr>
<td></td>
<td>-1 -2</td>
</tr>
<tr>
<td></td>
<td>Unlikely</td>
</tr>
<tr>
<td></td>
<td>-3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>OE3</th>
<th>(39) My using anabolic steroids sometime over the next 12 months would help me recover better from my workouts.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Likely</td>
<td>3 2 1 0</td>
</tr>
<tr>
<td></td>
<td>-1 -2</td>
</tr>
<tr>
<td></td>
<td>Unlikely</td>
</tr>
<tr>
<td></td>
<td>-3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>OE4</th>
<th>(40) My using anabolic steroids sometime over the next 12 months would allow me to make rapid gains in strength.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Likely</td>
<td>3 2 1 0</td>
</tr>
<tr>
<td></td>
<td>-1 -2</td>
</tr>
<tr>
<td></td>
<td>Unlikely</td>
</tr>
<tr>
<td></td>
<td>-3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>OE5</th>
<th>(41) My using anabolic steroids sometime over the next 12 months would make me become aggressive.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Likely</td>
<td>3 2 1 0</td>
</tr>
<tr>
<td></td>
<td>-1 -2</td>
</tr>
<tr>
<td></td>
<td>Unlikely</td>
</tr>
<tr>
<td></td>
<td>-3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>OE6</th>
<th>(42) My using anabolic steroids sometime over the next 12 months would allow me to have increased speed.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Likely</td>
<td>3 2 1 0</td>
</tr>
<tr>
<td></td>
<td>-1 -2</td>
</tr>
<tr>
<td></td>
<td>Unlikely</td>
</tr>
<tr>
<td></td>
<td>-3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>OE7</th>
<th>(43) My using anabolic steroids sometime over the next 12 months would cause me to fail a drug test.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Likely</td>
<td>3 2 1 0</td>
</tr>
<tr>
<td></td>
<td>-1 -2</td>
</tr>
<tr>
<td></td>
<td>Unlikely</td>
</tr>
<tr>
<td></td>
<td>-3</td>
</tr>
</tbody>
</table>

74
OE8  (44) My using anabolic steroids sometime over the next 12 months would allow me to have greater musculature (muscle definition).
Likely 3 2 1 0 -1 -2 Unlikely -3

OE9  (45) My using anabolic steroids sometime over the next 12 months would make me become sterile.
Likely 3 2 1 0 -1 -2 Unlikely -3

OE10  (46) My using anabolic steroids sometime over the next 12 months would allow me to make rapid gains in size.
Likely 3 2 1 0 -1 -2 Unlikely -3

OE11  (47) My using anabolic steroids sometime over the next 12 months would make me get me acne.
Likely 3 2 1 0 -1 -2 Unlikely -3

OE12  (48) My using anabolic steroids sometime over the next 12 months would make me have mood swings.
Likely 3 2 1 0 -1 -2 Unlikely -3

OE13  (49) My using anabolic steroids sometime over the next 12 months would allow me to train with increased intensity.
Likely 3 2 1 0 -1 -2 Unlikely -3

OE14  (50) My using anabolic steroids sometime over the next 12 months would allow me to have an improved appearance.
Likely 3 2 1 0 -1 -2 Unlikely -3

OE15  (51) My using anabolic steroids sometime over the next 12 months would make me irritable.
Likely 3 2 1 0 -1 -2 Unlikely -3

OE16  (52) My using anabolic steroids sometime over the next 12 months would cause me to retain water.
Likely 3 2 1 0 -1 -2 Unlikely -3

OE17  (53) My using anabolic steroids sometime over the next 12 months would allow me to have increased athletic performance.
Likely 3 2 1 0 -1 -2 Unlikely -3

OE18  (54) My using anabolic steroids sometime over the next 12 months would make me get shrunken testicles.
Likely 3 2 1 0 -1 -2 Unlikely -3
OE19 (55) My using anabolic steroids sometime over the next 12 months would make me get liver damage.

Likely
3 2 1 0 -1 -2 -3

Unlikely

OE20 (56) My using anabolic steroids sometime over the next 12 months would be illegal.

Likely
3 2 1 0 -1 -2 -3

Unlikely

OE21 (57) My using anabolic steroids sometime over the next 12 months would cost me a lot of money.

Likely
3 2 1 0 -1 -2 -3

Unlikely

OE22 (58) My using anabolic steroids sometime over the next 12 months would make me become addicted to anabolic steroids.

Likely
3 2 1 0 -1 -2 -3

Unlikely

These questions consist of a series of statements followed by a 6-point rating scale. Circle the number that most closely agrees with your own belief about the statement above it. The higher the number you circle the more closely you agree with the statement.

HLOC1 (1) If I take care of myself, I can avoid illness.

Strongly Disagree
1 2 3 4 5 6

Strongly Agree

HLOC2 (2) Whenever I get sick it is because of something I’ve done or not done.

Strongly Disagree
1 2 3 4 5 6

Strongly Agree

HLOC3 (3) Good health is largely a matter of good fortune.

Strongly Disagree
1 2 3 4 5 6

Strongly Agree

HLOC4 (4) No matter what I do, if I am going to get sick I will get sick.

Strongly Disagree
1 2 3 4 5 6

Strongly Agree

HLOC5 (5) Most people do not realize the extent to which their illnesses are controlled by accidental happenings.

Strongly Disagree
1 2 3 4 5 6

Strongly Agree

HLOC6 (6) I can only do what my doctor tells me to do.

Strongly Disagree
1 2 3 4 5 6

Strongly Agree

HLOC7 (7) There are so many strange diseases around that you can never know how or when you might pick one up.

Strongly Disagree
1 2 3 4 5 6

Strongly Agree

HLOC8 (8) When I feel ill, I know it is because I have not been getting the proper exercise or eating right.

Strongly Disagree
1 2 3 4 5 6

Strongly Agree
HLOC9 (9) People who never get sick are just plain lucky.
   Strongly Disagree 1 2 3 4 5 6
   Strongly Agree

HLOC10 (10) People's ill health results from their own carelessness.
   Strongly Disagree 1 2 3 4 5 6
   Strongly Agree

HLOC11 (11) I am directly responsible for my own health.
   Strongly Disagree 1 2 3 4 5 6
   Strongly Agree

Now please circle the number on the 6-point scale below which corresponds to how often you have the following thoughts (or beliefs) or do the following behaviors.

BD1 (1) I think my stomach is too big.
   Always 1 2 3 4 5 6
   Usually
   Often
   Sometimes
   Rarely
   Never

BD2 (2) I think my thighs are too small.
   Always 1 2 3 4 5 6
   Usually
   Often
   Sometimes
   Rarely
   Never

BD3 (3) I think my arms are just the right size.
   Always 1 2 3 4 5 6
   Usually
   Often
   Sometimes
   Rarely
   Never

BD4 (4) I feel satisfied with the shape of my body.
   Always 1 2 3 4 5 6
   Usually
   Often
   Sometimes
   Rarely
   Never

BD5 (5) I am not comfortable with the appearance of my body.
   Always 1 2 3 4 5 6
   Usually
   Often
   Sometimes
   Rarely
   Never

INF1 (6) I feel ineffective as a person.
   Always 1 2 3 4 5 6
   Usually
   Often
   Sometimes
   Rarely
   Never

INF2 (7) I feel alone in the world.
   Always 1 2 3 4 5 6
   Usually
   Often
   Sometimes
   Rarely
   Never

INF3 (8) I feel generally in control of the things in my life.
   Always 1 2 3 4 5 6
   Usually
   Often
   Sometimes
   Rarely
   Never

INF4 (9) I wish I were someone else.
   Always 1 2 3 4 5 6
   Usually
   Often
   Sometimes
   Rarely
   Never

INF5 (10) I feel inadequate
   Always 1 2 3 4 5 6
   Usually
   Often
   Sometimes
   Rarely
   Never

INF6 (11) I feel secure about myself.
   Always 1 2 3 4 5 6
   Usually
   Often
   Sometimes
   Rarely
   Never
<table>
<thead>
<tr>
<th>INF7  (12)</th>
<th>I have a low opinion of myself.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Always</td>
<td>Usually</td>
</tr>
<tr>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>INF8  (13)</th>
<th>I feel that I can achieve my standards.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Always</td>
<td>Usually</td>
</tr>
<tr>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>INF9  (14)</th>
<th>I feel that I am a worthwhile person.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Always</td>
<td>Usually</td>
</tr>
<tr>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>INF10 (15)</th>
<th>I feel empty inside.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Always</td>
<td>Usually</td>
</tr>
<tr>
<td>1</td>
<td>2</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>PER1  (16)</th>
<th>Only outstanding performance is good enough for my family.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Always</td>
<td>Usually</td>
</tr>
<tr>
<td>1</td>
<td>2</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>PER2  (17)</th>
<th>As a child, I tried very hard too avoid disappointing my parents and teachers.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Always</td>
<td>Usually</td>
</tr>
<tr>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>PER3  (18)</th>
<th>I hate being less than the best at things.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Always</td>
<td>Usually</td>
</tr>
<tr>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>PER4  (19)</th>
<th>My parents have expected excellence of me.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Always</td>
<td>Usually</td>
</tr>
<tr>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>PER5  (20)</th>
<th>I feel that I must do things perfectly or not do them at all.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Always</td>
<td>Usually</td>
</tr>
<tr>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>PER6  (21)</th>
<th>I have extremely high goals.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Always</td>
<td>Usually</td>
</tr>
<tr>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>PER7  (22)</th>
<th>People I really like end up disappointing me.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Always</td>
<td>Usually</td>
</tr>
<tr>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>PER8  (23)</th>
<th>Other people would say I'm emotionally unstable.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Always</td>
<td>Usually</td>
</tr>
<tr>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>PER9  (24)</th>
<th>I say things impulsively that I regret having said.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Always</td>
<td>Usually</td>
</tr>
<tr>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>IRI  (25)</th>
<th>I have to be careful of my tendency to abuse drugs.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Always</td>
<td>Usually</td>
</tr>
<tr>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>
IR2  (26) I feel trapped in relationships.
    Always Usually Often Sometimes Rarely Never
    1  2  3  4  5  6
IR3  (27) I can't get strange thoughts out of my head.
    Always Usually Often Sometimes Rarely Never
    1  2  3  4  5  6
IR4  (28) I am prone to outbursts of anger or rage.
    Always Usually Often Sometimes Rarely Never
    1  2  3  4  5  6
IR5  (29) I have to be careful of my tendency to abuse alcohol.
    Always Usually Often Sometimes Rarely Never
    1  2  3  4  5  6
IR6  (30) Others would say that I get irritated easily.
    Always Usually Often Sometimes Rarely Never
    1  2  3  4  5  6
IR7  (31) I experience marked mood shifts.
    Always Usually Often Sometimes Rarely Never
    1  2  3  4  5  6
IR8  (32) I feel like I must hurt myself or others.
    Always Usually Often Sometimes Rarely Never
    1  2  3  4  5  6
DOG (33) If I have a big task to accomplish I do a little bit at a time until I am done.
    Always Usually Often Sometimes Rarely Never
    1  2  3  4  5  6
IC   (34) I carefully consider the consequences of my behavior before acting.
    Always Usually Often Sometimes Rarely Never
    1  2  3  4  5  6
RT1 (35) I get a kick out of doing dangerous things.
    Always Usually Often Sometimes Rarely Never
    1  2  3  4  5  6
RT2 (36) I like to take risks.
    Always Usually Often Sometimes Rarely Never
    1  2  3  4  5  6
RT3 (37) I wear a seatbelt when ever I drive.
    Always Usually Often Sometimes Rarely Never
    1  2  3  4  5  6

Circle the number on each rating scale that best represents what you think about each statement. Please do not leave any questions blank. If you are unsure, please guess to the best of your knowledge.

ASK1 (1) Anabolic steroids are likely to cause kidney damage.
    Strongly Disagree  2  3  4  5  6  Strongly Agree
| ASK2 | (2) Anabolic steroids cause your testicles to shrink. |
|      | Strongly Disagree 1 2 3 4 5 6 | Strongly Agree |
| ASK3 | (3) Most people who use anabolic steroids experience no side effects. |
|      | Strongly Disagree 1 2 3 4 5 6 | Strongly Agree |
| ASK4 | (4) Some people who use anabolic steroids become addicted and can’t stop. |
|      | Strongly Disagree 1 2 3 4 5 6 | Strongly Agree |
| ASK5 | (5) Anabolic steroids can increase strength and muscle mass. |
|      | Strongly Disagree 1 2 3 4 5 6 | Strongly Agree |
| ASK6 | (6) Anabolic steroids can cause liver damage. |
|      | Strongly Disagree 1 2 3 4 5 6 | Strongly Agree |
| ASK7 | (7) Most anabolic steroids cause water retention. |
|      | Strongly Disagree 1 2 3 4 5 6 | Strongly Agree |
| ASK8 | (8) Most anabolic steroids sold on the black market are real. |
|      | Strongly Disagree 1 2 3 4 5 6 | Strongly Agree |
| ASK9 | (9) Anabolic steroids can cause reduced sperm count. |
|      | Strongly Disagree 1 2 3 4 5 6 | Strongly Agree |
| ASK10| (10) Anabolic steroids can cause acne. |
|      | Strongly Disagree 1 2 3 4 5 6 | Strongly Agree |
| ASK11| (11) Most people who use anabolic steroids experience “Roid Rage” (Extreme aggressiveness). |
|      | Strongly Disagree 1 2 3 4 5 6 | Strongly Agree |
| ASK12| (12) Anabolic steroids can cause male pattern baldness. |
|      | Strongly Disagree 1 2 3 4 5 6 | Strongly Agree |
| ASK13| (13) Some people who use anabolic steroids develop gynecomastia (enlargement of the male breasts). |
|      | Strongly Disagree 1 2 3 4 5 6 | Strongly Agree |
| ASK14| (14) Anabolic steroids have no affect on levels of blood cholesterol. |
|      | Strongly Disagree 1 2 3 4 5 6 | Strongly Agree |
| ASK15| (15) Tendon injuries and muscle tears are less common in steroid users. |
|      | Strongly Disagree 1 2 3 4 5 6 | Strongly Agree |
ASK16 (16) All the side effects of steroid use are reversible.  
Strongly Disagree 1 2 3 4 5 6  
Strongly Agree
ASK17 (17) People lose all of their muscle gains when they stop steroid use.  
Strongly Disagree 1 2 3 4 5 6  
Strongly Agree
ASK18 (18) Veterinary steroids do not work in human beings.  
Strongly Disagree 1 2 3 4 5 6  
Strongly Agree
ASK19 (19) Injectable steroids are harder on your liver than oral steroids.  
Strongly Disagree 1 2 3 4 5 6  
Strongly Agree
ASK20 (20) Cybergenics is almost as good as steroids but safer.  
Strongly Disagree 1 2 3 4 5 6  
Strongly Agree
ASK21 (21) Amino acids can be just as effective as steroids if they are taken properly.  
Strongly Disagree 1 2 3 4 5 6  
Strongly Agree
ASK22 (22) High doses of the right vitamins and minerals can increase strength and muscle mass.  
Strongly Disagree 1 2 3 4 5 6  
Strongly Agree
ASK23 (23) Most professional football players have used anabolic steroids.  
Strongly Disagree 1 2 3 4 5 6  
Strongly Agree
ASK24 (24) Anabolic steroids are difficult to acquire.  
Strongly Disagree 1 2 3 4 5 6  
Strongly Agree
ASK25 (25) Lifting weights every day is the best way to build size and strength.  
Strongly Disagree 1 2 3 4 5 6  
Strongly Agree
ASHM (26) How much do you think people risk harming themselves (physically or in other ways) if they use steroids?  
No Risk 1 2 3 4  
Slight Risk 1 2 3 4  
Moderate Risk 1 2 3 4  
Great Risk 1 2 3 4
ASAP (27) How much do you disapprove of people using steroids?  
Don't Disapprove 1 2 3 4  
Disapprove 1 2 3
PRES (28) How much pressure do you feel from your friends to use anabolic steroids?  
No Pressure 1 2 3 4 5  
A Little 1 2 3  
Some 1 2 3  
Quite a Bit 1 2 3 4  
A Lot of Pressure 1 2 3 4 5
CURRICULUM VITA
1994
DANIEL I. GALPER

PERSONAL INFORMATION

Birth Date: November 30, 1966

Home Address: 1437 Sandy Circle
                Blacksburg, VA 24060
School Phone:  (703) 231-8746
Home Phone:  (703) 552-6033

EDUCATION

August 1992- Present
Virginia Polytechnic Institute and State University
Blackburg, Virginia
Doctoral Program (Masters level)
Specialization: Clinical Health Psychology
Major Advisor: Dr. Richard A. Winett

June 1994
Clinical Hypnosis Training
23.5 hours training in clinical hypnosis for pain management and trauma resolution

September 1984- May 1990
Duke University
B.A. awarded May, 1990
Durham, North Carolina
Major: Psychology

POSITIONS HELD

August 1992- Present
Graduate Research Assistant
Center for Research in Health Behavior
Blackburg, Virginia
Supervisor: Dr. Richard A. Winett
Duties: NCI Grant Development; Consultant and Recruitment on 4 Exercise Promotion Projects.

August 1993- Present
Graduate Teaching Assistant
Department of Psychology
Virginia Polytechnic Institute and State University
Supervisor: Dr. Joseph A. Sgro
Duties: Teach Introduction to Psychology Discussion Course (4 Sections)

August 1993- Present
Graduate Research Assistant
2 year Community Skin Cancer Prevention Program, American Cancer Society
Center for Research in Health Behavior
Supervisors: Dr. David N. Lombard & Dr. Richard A. Winett
Duties: Develop and Conduct Intervention; Develop Data Coding System; Collect and Enter Data.
### Graduate Research Assistant
**May 1993 - August 1994**
**Stress Lab, Department of Psychology**
Virginia Polytechnic Institute and State University  
Supervisor: Dr. Russell T. Jones  
Duties: Develop Coding System; Supervise Coding of Data.

### Clinical Health Researcher
**July 1990 - July 1992**
**Laboratory for Children’s Health Promotion**
Georgetown University School of Medicine  
Washington, D.C.  
Supervisor: Dr. Ronald J. Iannotti  
Duties: Project Development, Data Collection with Clinical Interviews and Surveys; Data Coding, Entry, and Management.

### Corporate Health and Fitness Counselor
**June 1990 - July 1992**
**Personal Fitness, Washington, D.C.**  
Supervisor: Douglas Baumgarten, Director  
Duties: Exercise Testing (Strength, Aerobic Capacity, Flexibility, Bodyfat Analysis), Prescription, and Personal Training.

### CLINICAL EXPERIENCE

<table>
<thead>
<tr>
<th>Date Range</th>
<th>Position and Affiliation</th>
<th>Details</th>
</tr>
</thead>
</table>
| September 1992 - Present | Student Clinician  
**Psychological Services Center**  
Virginia Polytechnic Institute and State University  
Supervisors: Dr. Thomas H. Ollendick & Dr. George A. Clum | Duties: Intellectual Assessments; Personality Assessments; Individual, Couples, and Family Therapy. |
| May 1992 - September 1992 | Co-Therapist  
**Parent Training Group**  
Psychological Services Center  
Supervisor: Dr. Richard Eisler | Duties: Teach Parents Behavioral Management Techniques; Group Therapy. |
| May 1991 - August 1992 | Hotline Volunteer  
**PhoneFriend: Crisis Helpline for Children** | Duties: Talk to Troubled Children; Train New Volunteers. |
| March 1989 - August 1989 | Volunteer Recreation Therapist  
**John Ulmstead State Psychiatric Hospital**  
Durham, North Carolina | Duties: Supervise Activities with Chronic Mentally Ill Patients. |

### Professional Affiliations and Honors
- **American Psychological Association**  
  (Divisions: 28 - Psychopharmacology and Substance Abuse  
  29 - Psychotherapy  
  30 - Psychological Hypnosis  
  38 - Health Psychology  
  47 - Exercise and Sport Psychology)
American Society of Clinical Hypnosis
Association for the Advancement of Behavioral Therapy
National Strength and Conditioning Association
Society of Behavioral Medicine
Dean's List (Duke University) - 1989-1990

PROFESSIONAL PRESENTATIONS


PUBLICATIONS


EDITORSHIP

March 1993 - Present
Journal of Applied Behavioral Analysis
Guest Reviewer

CONFERENCE AND WORKSHOPS ATTENDED

Training the Future Professorate, Virginia Tech Fall Workshop - 1994
Sixth Annual Eastern Regional Conference on Abuse and Multiple Personality - 1994
Virginia Developmental Forum - 1992
National Council on Patient Information and Education - 1992

CERTIFICATIONS

CPR - American Heart Association - 1991

COMPUTER SOFTWARE/SKILLS

Wordperfect 5.1; DBase IV; Lotus 1-2-3; SPSS for Windows; Minitab for Windows; SAS for Windows (limited experience)
FITNESS TRAINING/ASSESSMENT EQUIPMENT

8 years experience training myself and clients on a wide range of equipment
Strength Training Equipment:
   Free Weights and Machines (Cybex, Bodymasters, Nautilus, etc.)
Aerobic Equipment:
   Lifecycle, Monarch, Airdyne. Stairmaster, Concept II Rower, etc.

REFERENCES

Richard A. Winett, Ph.D.
Professor of Psychology and
Director, Center for Research in Health Behavior
Department of Psychology
Derring Hall
Virginia Polytechnic Institute and State University
Blacksburg, VA 24060-0436
(703) 231-8747

Thomas H. Ollendick, Ph.D.
Professor of Psychology and
Director of Clinical Training
Department of Psychology
Derring Hall
Virginia Polytechnic Institute and State University
Blacksburg, VA 24061-0436
(703) 231-