

The Relationship Between Conformity to Masculine Norms, Help-Seeking Attitudes
and Health Promotion Behavior Among Males Who Use Appearance and Performance-

Enhancing Drugs

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WILLIAM M. FOLBERTH

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APPROVED:

James Langenbucher, PhD

Thomas Hildebrandt, PsyD

DEAN:

Stanley Messer, PhD

ABSTRACT

The purpose of this study is to explore the relationship between conformity to masculine norms, attitudes towards seeking professional psychological help, and health-promotion behaviors among men who use appearance and performance-enhancing drugs (APEDs). One hundred and ninety-three men who use APEDs were recruited from Internet message boards to respond to an anonymous on-line survey. Major areas of the survey assess current levels of supplement and/or drug use, training identity, exercise patterns, diet and health-promotion behaviors, conformity to masculine norms, attitudes towards seeking help and other typical behavioral patterns. The survey includes the Conformity to Masculine Norms Inventory – 46 (CMNI-46), the Attitudes Towards Seeking Professional Psychological Help Scale – Short Form (ATSPPH - SF) and the Health Behavior Inventory – 20 (HBI-20). APED-using men who endorse and conform to traditional masculine norms are significantly less likely to hold positive attitudes towards seeking professional psychological help, and they are less likely to engage in health-promotion behaviors. Adequate power exists to determine both of these medium effects using a Pearson r correlation. Subscales for masculine norms and health-promotion behavior were also examined. APED-using men who conform to the masculine norms of emotional control, self-reliance, violence and power over women, are less likely to hold positive attitudes towards seeking professional psychological help. Men who conform to these four norms are also less likely to engage in health promotion behavior. Finally, levels of conformity to masculine norms and attitudes towards seeking psychological help are found to predict health-promotion behaviors

among APED users. Limitations and recommendations for future research are discussed.

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Introduction

Background

Appearance and performance-enhancing drugs (APEDs) constitute a wide range of substances, including anabolic-androgenic steroids, nonsteroidal anabolics, and licit and illicit ergo/thermogenics (Hildebrandt, Langenbucher, Carr, & Sanjuan, 2007). The most widely discussed APEDs are anabolic-androgenic steroids, which include a range of testosterone and nortestosterone derivatives (Hildebrandt et al., 2007). APED users are at risk for negative physical and psychological consequences as a result of their use, though certain important caveats exist. APEDs have also been associated with physical, psychological and medical benefits for the user.

Epidemiology. APED users are estimated to represent between 2.8-3.8% of the population, based on global lifetime prevalence rates from a recent large-scale meta-analysis (Sagoe, Molde, Andreassen, Torsheim, & Pallesen, 2014). Among men, global lifetime prevalence rates of APEDs are believed to be higher, falling between 5.3-7.7% of the total population (Sagoe et al., 2014). In the United States, it is estimated that between 2.7-3.4% have used APEDs at least once in their lifetime (Kanayama, Hudson, & Pope, 2010; Sagoe et al., 2014). Among high school students, approximately 2.1-2.5% have reported using APEDs (Sagoe et al., 2014). However, self-reported rates among high school students must be viewed with skepticism, as they are likely to reflect an overestimation of use. This overestimation of use among teenagers stems primarily from peer pressure, as well as from poorly worded questionnaires regarding steroid use (Kanayama, Brower, Wood, Hudson, & Pope, 2009). Among college-level athletes, a large-scale survey reveals that 3.1% of NCAA athletes report

using one of 11 commonly used APEDs (Buckman, Farris, & Yusko, 2013). However, just as teenagers are thought to overestimate rates of use, college athletes are likely to underreport due to current NCAA sanctions against APED use. Recreational sportspeople, including attendees of gyms known for bodybuilding, report a lifetime prevalence of between 11.2-28.8% globally (Sagoe et al., 2014; Sjoqvist, Garle, & Rane, 2008; Van Amsterdam, Opperhuizen, & Hartgens, 2010).

Pathophysiology. Research suggests that APED users are at risk for negative physical consequences as a result of their use. Despite the existing literature tracking some of the associated risk factors, the true pathophysiology of APED use remains largely unknown (Kanayama, Hudson, & Pope, 2008).

Cardiovascular risks. One commonly cited health problem associated with chronic APED use is the increased risk of cardiovascular problems (Trenton & Currier, 2005). Sudden cardiac death, or a sudden unexpected death caused by loss of heart function, is a health risk associated with chronic APED use, and has been observed in posthumous case studies of APED users (Montisci et al., 2012). A recent case study examined the bodies of four athletes (three bodybuilders, one cyclist) with a history of APED use who died between the ages of 25 and 32. Three of the individuals died from sudden cardiac death, while one died from congestive heart failure. All had a documented history of APED use, and two had APEDs in their bodies at the time of death. Three were observed to have left ventricle hypertrophy, or an enlargement of the muscle tissue that makes up the wall of the heart, which has been linked to sudden cardiac death. This finding also confirms previous findings that left ventricle hypertrophy is the most typical cardio-pathological abnormality in APED users (Achar,

Rostamian, Sanjiv & Narayan, 2010; Far, Agren, & Thiblin, 2012). Despite documentation that sudden cardiac death and left ventricle hypertrophy are associated with APED use, certain important caveats exist.

Dose-dependent and reversible cardiovascular effects. The aforementioned studies do not confirm that sudden cardiac death is caused by APED use. First, observational case studies make the interpretation of pathological findings difficult (Montisci et al., 2012). Furthermore, the magnitude of the left ventricle hypertrophy stemming from APED use depends upon the type, duration and volume of anabolic steroids being used. The cardiovascular system possesses a large number of high-affinity androgen receptors that bind to APEDs upon administration (Sullivan, Martinez, Gennis, & Gallagher, 1998). Cardiac hypertrophy induced by APEDs appears to be generated by a direct action on cardiac androgen receptors, whose effects are directly proportional to the doses, time and duration of the drug administration (Liu, Death, & Handelsman, 2003; Montisci et al., 2012). The underlying mechanism involved in left ventricle hypertrophy stemming from APEDs remains poorly understood, but is thought to involve the renin-angiotensin aldosterone system (RAS) – a complex signaling pathway that regulates the body's blood pressure (Payne, Kotwinski, & Montgomery, 2004). This signaling pathway is also impacted by the valsalva maneuver, which involves an attempt to forcefully exhale while keeping the mouth and nose closed. Finally, the effects of APEDs on other cardiovascular problems such as changes in serum lipid levels and elevations in blood pressure appear to be reversible upon cessation of the drug (Dhar et al., 2005; Parssinen & Seppala, 2002).

Hepatic risks. Liver toxicity has also been associated with APED use, though recent studies suggest that the actual risk of hepatic dysfunction is overstated (Dickerman, Pertusi, Zachariah, Dufour, & McConathy, 1999; Socas et al., 2005; Urhausen, Albers, & Kindermann, 2003). Common conditions linked to APED use are an increased risk for liver tumors, hepatoacellular adenomas, and hepatic cancer (Hoffman & Ratamess, 2006). Similar to studies of cardiovascular effects, studies documenting liver disease among athletes and bodybuilders who use APEDs stem mostly from case studies (Socas et al., 2005). One case study described the presence of large liver lesions in an individual who had self-administered APEDs over the course of 15 years (Socas et al., 2005).

Reversible hepatic effects and physician misperceptions. Evidence from recent studies suggests that the correlation between APED use and liver toxicity is overstated, and that many of the harmful effects of use are reversible upon cessation of APEDs (Hoffman & Ratamess, 2006; Urhausen, Albers, & Kinderman, 2004). One study reported a significant improvement in liver functioning and other health markers following the cessation of APEDs (Modlinski & Fields, 2006; Socas et al., 2005). Another study compared various blood parameters of bodybuilders who were currently using APEDs to a second group of bodybuilders who had recently discontinued their APED use for 12 months (Urhausen et al., 2003). Both groups report self-administering high-dose levels of APEDs over a period of at least eight to nine years. Among the former APED users, the negative effects of high-dose APED use had returned to normal levels in blood count, liver functioning and hormone levels after one year of discontinuation (Urhausen et al., 2003). Finally, studies reveal that physicians tend to

overestimate the impact of APED use on liver toxicity when examining the blood serum and enzyme levels of bodybuilders (Pertusi, Dickerman, & McConathy, 2001).

Gynecomastia. Another physical consequence of APED use is gynecomastia. Gynecomastia refers to an enlargement of the male breast resulting from an altered estrogen-androgen balance, or to an increase in breast sensitivity due to a circulating estrogen level (Hoffman & Ratamess, 2006). Such increases in estrogen production in men stem primarily from the aromatization of circulating testosterone. The estimated prevalence rate for gynecomastia involving a significant enlargement in breast size is estimated to be 37% among anabolic steroid users (O'Sullivan et al., 2000). Many APED users will take a nonsteroidal aromatase inhibitor to minimize gynecomastia and to indirectly stimulate testosterone production (O'Sullivan et al., 2000). Unfortunately, once gynecomastia has developed, corrective cosmetic surgery is required to reverse the unwanted breast enlargement.

Hypogonadism. Another physical side effect of APED use involves the reproductive system. Specifically, long-term APED use suppresses the hypothalamic-pituitary-testicular (HPT) axis, and male users may experience temporary hypogonadism upon cessation of APED use or at the end of a cycle (Tan & Scally, 2009). While some evidence suggests that hypogonadism may lead to fertility problems and depression symptoms, this problem typically resolves itself within a few weeks as the HPT axis recovers spontaneously (De la Torre Abril et al., 2005; Kanayama et al., 2008). Additional negative effects of APED use have been documented in the musculoskeletal, endocrine and immunological domains (Maravelias, Dona, & Stefanidou, 2005).

Negative psychological effects of APEDs. In addition to these physical side effects, negative psychological effects of APED use have been widely reported in the literature, though certain caveats exist. Irritability, mania/hypomania and aggression in response to frustration, are cited most often as psychological side effects associated with APED use (Kanayama et al., 2008). However, these psychological symptoms have been observed to be dose-dependent, inconsistently reported and with possible confounds from pre-existing psychological symptoms (Perry et al., 2003).

Limitations of existing research on the negative psychological effects of APEDs. One large problem encountered by attempts to examine associations between aggression, mania and APED use, is that researchers are not able to mimic supraphysiological doses of APEDS that are commonly used by individuals to achieve desired physical results (Pagonis, Angelopoulos, Koukoulis, Hadjichristodoulou, & Toli, 2006). This is largely due to issues of safety with regards to the subjects who are participating, and the potential of inflicting unwanted harm on them at higher dose levels. Thus, studies that examine the impact of lower doses of APEDs on psychological symptoms and other side effects, though informative, may not capture the true impact of APEDs as they are actually being used in non-research settings.

In addition, researchers have also focused mostly on the impact of one type of APED on psychological symptoms. However, APED users typically use more than one type of substance at once, and for varying lengths of time (i.e. ‘stacking’). One goal of stacking is to maximize positive muscular and endurance gains, while minimizing unwanted negative side effects. Just as high dose levels have the potential to put

participants at risk, stacking regimens also have the potential to inflict unwanted harm in a research setting (Pagonis et al., 2006).

Controlled research studies have not been able to capture high dose or stacking usage patterns, and much of what has been gleaned from scholarly investigations must be considered with these limitations in mind. That said, the current literature that focuses on the impact of APED use on psychological symptoms does reveal certain important and relevant findings.

The impact of APEDs on mania and aggression. One randomized, placebo-controlled, double-blind crossover study examined the psychiatric effects of intramuscular testosterone cypionate on males at doses as high as 600mg/week (Pope, Kouri, & Hudson, 2000). Fifty males between the ages of 20 and 50 were recruited from local colleges and gyms from a population that consisted of either former APED users, current weightlifters who had never used APEDs or non-weightlifters who had never used APEDs. The exclusion criteria consisted of the presence of substance abuse or dependence within the last year, current or past mood disorder or psychotic symptoms, any prior use of psychiatric medication, a clinically significant medical condition or having used APEDs within the last 90 days (Pope et al., 2000). Participants were randomized to receive intragluteal injections of testosterone or a placebo under double-blind conditions, followed by a 6-week ‘wash-out’ period where they were given no substances or placebos. Each participant received both the placebo and testosterone regimen for a 6-week period. During the testosterone treatment period, participants received 150mg in each of the first 2 weeks, increasing to 300mg for weeks 3 and 4, and ending with a maximum dose of 600mg/week during weeks 5 and 6 (Pope

et al., 2000). Over the course of 25 weeks, participants completed weekly self-report measures tracking their mania symptoms (Young Mania Rating Scale – YMRS), depression symptoms (Hamilton Depression Rating Scale – HDRS), aggression (Aggression Questionnaire of Buss and Perry – AQ) and a general psychiatric symptom checklist (Symptom Checklist – 90 – SCL-90). A computerized task measuring aggression was also utilized at six points throughout the entire study. Participants were asked to keep a diary at home, which tracked symptoms of mania and symptoms of aggression, as well as how much they ‘liked’ the current medication they were receiving (either testosterone or the placebo). Significant others were also asked to keep a similar diary tracking their perception of the participants’ mania and aggression over the past seven days. Blood-work was also collected on a weekly basis.

Results revealed that self-report measures of mania (YMRS) and computerized measures of aggression were statistically significantly in the testosterone treatment group (Pope et al., 2000). Diary scores of mania were also statistically significantly in the testosterone treatment condition (Pope et al., 2000). An additional analysis examined the maximum score reported by each subject on the YMRS measure of mania, to uncover the trends with regards to severity. Of note, was that only a small group (n=2) of users reported mania scores associated with social and occupational impairment (YMRS scores of > 20). Furthermore, another relatively small group (n=6) of users reported moderate levels of mania indicative of milder hypomanic symptoms (YMRS score between 10-19). In contrast, a much larger number of users (n=42) displayed minimal increases in mania scores, as measured by their highest weekly score on the YMRS falling in the range of 0-10 (Pope et al., 2000). The important finding

here is that although mania scores increased significantly during the testosterone treatment, as compared to the placebo control condition, this effect was not uniformly observed across all participants. In fact, the majority of participants experienced minimal mania symptoms in conjunction with their testosterone injections. This finding supports three previous placebo-controlled studies examining the impact of testosterone on mania, where only a small portion of participants exhibited manic or hypomanic reactions (Yates, Perry, MacIndoe, Holman, & Ellingrod, 1999; Bhasin et al., 1996; Su et al., 1993). In addition, three of the outcome measures did not reveal significant changes during the testosterone phase; total scores on the AQ, the global severity index on the SCL-90 and depression symptoms as measured by the HDRS. Thus, while testosterone use was associated with an increase in mania scores across a few participants, other psychological symptoms were not elevated at all among these same participants (Pope et al., 2000).

The effects of stacking on psychological symptoms. As mentioned earlier, many APED users are likely to use a combination of two or more APEDs at once, and at doses even higher than the 600mg/week (Pagonis et al., 2006). As we know from previous studies, many effects of APED use are dose-dependent, with higher doses correlating with a higher number of observed symptoms (Hildebrandt, Alfano, & Langenbucher, 2010; Hildebrandt et al., 2007; Hildebrandt, Lai, Langenbucher, Schneider, Yehuda, & Pfaff, 2011).

One recent study did investigate the psychological consequences of APED use that more closely resembles doses and combinations being used by recreational users and bodybuilders (Pagonis et al., 2006). Researchers utilized an observational cohort

study of 320 amateur and recreational bodybuilders to compare psychiatric symptoms among active APED users to a placebo and a control group. Their goal was to examine the impact of higher doses and stacking on psychiatric symptoms, with the hypothesis that the severity of use would correlate with the severity of psychiatric symptoms experienced by each user. A questionnaire was used to recruit active APED users. Participants were then placed in one of three groups; Group C administered regimens of APEDs that they obtained themselves, Group B administered regimens of placebo compounds and Group A was used as the control group (Pagonis et al., 2006). While information was not provided with regards to how well the groups matched on important predisposing variables, participants were randomly assigned to one of the three groups. Group C participants supplied their own APEDs, and the average length of their cycle was 9.4 weeks. The athletes in Group C utilized two to four oral agents, in combination with one to three long-acting injectable APEDs (Pagonis et al., 2006).

Of note, the dosage levels for oral agents were approximately 3 times greater than doses utilized under previous controlled studies, and the injectable agents used by participants were as much as 5 to 10 times greater than those utilized in other studies (Pagonis et al., 2006). Validity and homogeneity of all groups was ensured by random doping tests of urine samples on all three groups at week 4 of the study, and all of the athletes tested were within the expected parameters of their original group categorization. All drugs that were of unknown origin or were obtained from the 'black market' were analyzed and validated by a process of mass spectrometry detection, to ensure the validity of use and proper categorization of each subject (Pagonis et al., 2006). Each participant was then classified into one of three severity categorizations:

light, medium and heavy. This rating was based on a point system that considers the number of compounds used (e.g. 1 point = less than three compounds, 2 points = three to five compounds, 3 points = more than five compounds), the type of APED, the dosage level, the therapeutic index of the compounds being used, total number of completed past cycles and duration of time that each previous cycle had lasted. 'Light users' were demarcated by a score of 12 or less, 'medium users' fell within the 12-28 range and 'heavy users' scored greater than 18 using this scoring system. One potential problem with this rating system is that equal weight was given to each variable, such that 'number of compounds used' was assigned the same weight as 'number of cycles completed in the past.' This may underestimate certain key components, such as dosage level, that more directly impact the severity of one's use. Twenty-eight participants were categorized as 'light users', 59 were 'medium users' and 73 were 'heavy users.' Outcome measures included the SCL-90 and the Hostility and Direction of Hostility Questionnaire (HDHQ). The SCL-90 measures nine subscales of psychiatric symptomatology, while the HDHQ measures the readiness to respond with aggressive behavior and a tendency to evaluate persons, including the self, in negative terms.

Results show that Group C reported significantly higher levels of hostility and aggression, when compared to the placebo and control groups (Pagonis et al., 2006). Also, the SCL-90 global rating was significantly elevated in Group C, in comparison to the placebo and control groups. Differences between the values for all subscales of the SCL-90 and HDHQ in the three 'severity of use' categories were highly significant (Pagonis et al., 2006). That is, as the severity of use increases from light to heavy, so

then does the level of self-reported symptoms of hostility and general psychiatric symptoms. These data suggest that negative psychiatric symptoms seem to be dose-dependent, such that higher levels of APED use are correlated with a greater severity of psychiatric symptoms.

Long-term psychological effects of APED use. While this study examines the acute, short-term impact of APED use, far less is known about the potential long-term effects of supraphysiological doses and polysubstance abuse of APEDs (Kanayama et al., 2008). While many individuals who use APEDs are young men, a large group of men who began using APEDs in the 1980s are now entering the later stages of their life. Though these men may not be currently using APEDs, there is accumulating concern that these men are at-risk for psychiatric and medical problems stemming from their former use. Some have even suggested that this phenomenon is a growing public health concern (Kanayama et al., 2008). A recent study conducted a retrospective 30-year follow-up of former Swedish-elite male athletes with a history of APED use (Lindqvist et al., 2013). The athletes included in the study were ranked in the top 10 national ranking at any point between 1960 and 1979 among four strength-focused sports: wrestling, Olympic lifting, powerlifting and the throwing events in track and field (i.e. javelin, shot put, discus). A questionnaire was sent to the athletes, which included questions about previous athletic activity, lifetime prevalence of mental-health problems and previous substance use patterns. Approximately 21% of the 683 athletes included in the study reported having used APEDs at some point in their life (Lindqvist et al., 2013). Compared to non-users, former APED-users were significantly more likely to have sought help for symptoms of depression, difficulty concentrating and excessive

worry. Respondents were also placed into one of two categories based on the severity of their prior APED use. Severity of prior use was operationalized in this study based on the length of time during which the individual used APEDs, as well as the frequency of their use. ‘Former high APED-users’ report having completed several APED cycle for a duration of more than 2 years, while ‘former low APED-users’ report using APEDs for less than 2 years (Lindqvist et al., 2013). As compared to former low APED-users, former high APED-users were more likely to have used APEDs in conjunction with other illicit drugs, and were more likely to have sought professional help for anxiety, irritation and anger (Lindqvist et al., 2013). This result further supports the importance of considering severity of abuse when assessing psychiatric symptoms, but moreover illuminates some long-term psychiatric effects that are experienced by former APED users. One caveat of these data is that the time lapse between the cessation of APED use and seeking help for these symptoms is unknown. Without this information one cannot determine whether these symptoms were present immediately following the discontinuation of APEDs, or whether they emerged much later in life. Also, it is important to consider that these symptoms may not have been caused by the individual’s APED use, since it is possible that the athlete may have had a pre-existing condition prior to even beginning and discontinuing his APED regimen. Nonetheless, these data represent important long-term mental health considerations associated with APED use.

The impact of APEDs on aggressive behavior. Aggression has also been cited as an adverse negative psychological effect associated with steroid use. Aggression is often seen as a response to frustration, and the result of a low-frustration tolerance. As

with other side effects of APED use, levels of aggression are dose-dependent and correlated with the course of administration (Pagonis et al., 2006). Amateur athletes using high doses of APEDs in 6-14 week cycles reported significantly more instances of verbal aggression when compared to a non-APED using control group (Parrot, Choi, & Davies, 1994). APED users reported greater involvement in violent behaviors compared with those who did not use steroids, even after controlling for previous violent behavior and drug use (Beaver, Vaughn, Delisi, & Wright, 2008). Increases in recurrent impulsive behavior is a behavioral marker of APED use, which can lead to an increase in other high-risk behaviors such as unprotected sex or other drug use (Hildebrandt, Lai, et al., 2011; Pope et al., 2000).

Physical benefits of APEDs. A number of physical benefits have also associated with APED use, which is a major reason why most individuals begin taking them. Physical benefits of APED use that have been well documented include increases in muscle size and strength, enhanced athletic performance, reduced recovery time and increases in lean body mass (Hartgens & Kuipers, 2004).

Muscle size and strength. APEDs allow the user to greatly increase muscle strength, often well beyond the limit attainable by natural means (Kanayama et al., 2008). One of the first placebo-controlled, double-blind randomized trials separately assessed the effects of 600mg/week doses of testosterone and resistance exercise on muscle-size and strength (Bhasin, Woodhouse, & Storer, 2003). Results from this study reveal that 10 weeks of testosterone administration led to significant increases in the muscle size (as measured by cross-sectional area) and strength of both the triceps and quadriceps (Bhasin et al., 2003). When combined with strength training, this regimen

resulted in even larger increases, when compared to individuals who were not taking testosterone (Bhasin et al., 2003). Of note, injectable testosterone at the 600mg/week level has been shown to improve strength even without a concomitant exercise program (Hartgens & Kuipers, 2004). Testosterone enanthate has been demonstrated to consistently enhance strength after administration of doses at 300mg/week and higher (Hartgens & Kuipers, 2004).

Athletic performance. APEDs are used to not only increase muscle size and strength, but also to enhance athletic performance (Pagonis et al., 2006). When asked for the main reason why they chose to use APEDs, 81% percent of Swedish athletes who used APEDs report that they ‘wanted to achieve better results in their event’, while another 56% reported that they wanted to ‘train harder’ (Lindqvist et al., 2013).

Recovery time. Reduced recovery time following strenuous physical activity is another benefit of APEDs, though research done in this area has only focused on indirect parameters that are associated with recovery time following strenuous exercise (Hartgens & Kuipers, 2004). One study found lower levels of cortisol and plasma lactate in APED users as compared with non-users, following the completion of a strength-training workout (Rozenek, Rahe, & Kohl, 1990). Additionally, after a strenuous resistance-based training session, heart rate and lactate levels returned to baseline faster among APED users (Hartgens & Kuipers, 2004).

Lean body mass. In terms of lean body mass, most studies confirm that body weight is likely to increase by 2-5kg as a result of short-term use (<10 weeks), though anecdotal reports from strength athletes suggest increases of 10-15kg are attainable (Hartgens & Kuipers, 2004). As mentioned, laboratory studies may not adequately

mimic the actual APED induced improvements of strength and body mass since the drugs and doses investigated in most studies are not in agreement with current steroid administration regimens.

Positive psychological effects of APEDs. Other psychological benefits have been noted and reported by athletes and others who use APEDs. Adult men have reported a transient euphoria and hypomania early in the course of APED cycle (Thiblin & Petersson, 2005). In addition, results from two controlled studies suggest that testosterone may have anti-depressant properties among the HIV-positive population, either alone or in combination with anti-depressant medication (Pope & Kanayama, 2012). These findings have spurred additional studies to explore testosterone as an anti-depressant medication, though this area remains inconclusive (Kanayama et al., 2010). Anecdotal evidence from semi-structured interviews with men who have used APEDs at least once in their life support these claims. When describing his most recent cycle, one APED user states that “I am personally a lot more energetic and aggressive... a lot more confident...for the fact that I look better. I just tend to attack things...and everything seems to be clicking (for me). I feel better.” (Olrich & Ewing, 1999, page 305). Another former user alludes to the increase in peer recognition he experienced while using APEDs, and his increased confidence in social situations. He states that “When you’re on steroids, if you’re bigger, you’re stronger, and you’re getting personal recognition from your peers...people are noticing you (more)” (Olrich & Ewing, 1999, page 306). Taken together, these findings highlight an increase in one’s sense of well-being while taking APEDs, which is experienced in addition to other physical benefits.

Medical benefits of APED use. Testosterone and APEDs have produced significant benefits for patients suffering from certain long-term medical illnesses. For example, testosterone has been used to effectively treat male hypogonadism through the use of transdermal gels and patches, though synthetic forms are typically not needed (Pope & Kanayama, 2012). In addition, patients with chronic obstructive pulmonary disease and HIV have been able to increase their lean body mass by using APEDs, and in turn improve their prognosis (Hartgens & Kuipers, 2004). Other conditions that may also benefit from the use of APEDs include anemia, hereditary angioedema and even breast cancer (Pope & Kanayama, 2012).

Attitudes towards professionals among APED users. Despite the previously mentioned risks, APED users rarely disclose their using patterns to physicians or psychologists. One proposed reason for non-disclosure is that APED users perceive professionals as lacking sufficient knowledge about the names of drugs, the typical dosage amounts and their mechanisms of action (Kutscher, Lund, & Perry, 2002). When asked about their level of trust regarding the knowledge of professionals on varying topics, APED and non-APED weightlifters gave professionals significantly lower ratings on perceived knowledge about APED use than that of other health related topics (including alcohol and ‘street drugs’) (Pope, Kanayama, Ionescu-Pioggia, & Hudson, 2004). In fact, 40.5% of APED users trusted the individual who sold them their steroids as least as much as they trusted their medical professional regarding APED-related information. This suggests that APED users may not discuss their use with professionals because they perceive them as lacking sufficient knowledge about APEDs. Instead, they are more likely to rely on friends and fellow APED users for

information and support regarding their use. The result is that medical professionals are unlikely to know about one's APED use, as a recent study reveals that 56% of APED users reported that they had never disclosed their APED use to any physician they had seen (Pope et al., 2004). Skepticism with regards to physician's knowledge about APEDs may be warranted, as 37% of primary care providers in Great Britain report feeling quite unconfident or very unconfident with regards to providing medically sound advice to an APED user (Lenehan, 2002).

However, the phenomenon of withholding information from physicians regarding substance use is not limited to APEDs and APED users. The amount and frequency of other drug use, including alcohol and tobacco, is often underreported to physicians by the general population (Arnaout & Petrakis, 2008). This seems to reflect a systematic failure within the medical and mental health fields to effectively address substance use among the larger population, and does not represent a peculiarity of any one particular group such as APED users.

Masculinity, Health and Attitudes Towards Seeking Help

Given the aforementioned lack of respect towards health professionals by APED users, more information is needed to uncover their actual attitudes towards seeking help from these professionals. Aside from the perception that mental health and medical professionals are not knowledgeable about the substances they take, very little has been written about other individual and societal factors which may also impact an APED users' decision to withhold information from these professionals. What messages have they received over the course of their life as men, as athletes, and as individuals that

dissuade them from sharing details of their APED use, or other areas of their life, with doctors and professionals?

Socially constructed gender norms. Extant literature on socially constructed gender norms informs attitudes towards seeking help from health professionals for men (Hammer, Vogel, & Heimerdinger-Edwards, 2013; Levant, Wimer, & Williams, 2011; Levant, Wimer, Williams, Smalley, & Noronha, 2009; Liu & Iwamoto, 2007; Vogel, Heimerdinger-Edwards, Hammer, & Hubbard, 2011). Gender role norms, or rules and standards that guide and constrain behavior among men and women, are communicated through social interactions (Mahalik, Locke, et al., 2003). These norms are enacted when individuals observe what most men and women do or say in social situations, and through these interactions, messages about acceptable or normative behavior for men and women are communicated (Mahalik, Locke, et al., 2003). The messages can be transmitted through passive observation, such as when a teenager notices that most men tend to not wear clothing that is pink, or when the male protagonist in a movie responds with violence when challenged (Mahalik, Locke, et al., 2003). In addition, these masculine norms may be communicated more directly, such as when a father or coach tells a boy that ‘big boys don’t cry.’ Boys and men in particular learn powerful and enduring ideals about how to think, feel and act in their role as males (Burns & Mahalik, 2011). As a result, boys and men come to learn what is expected of them in social situations, and what responses are deemed appropriate by societal standards.

While this study focuses on gender norms that are socially constructed over time, it is important to note that many theories exist about the development of gender normative behavior. These theories and concepts are not within the scope of this study,

but are nonetheless important to acknowledge and consider. Innate biological and physiological differences exist between males and females, including discrepancies in secondary sex characteristics and certain hormone levels (Geary, 2009). It is important to note that innate biological differences also impact gender-specific behaviors, and that not all gender norms are acquired through social learning (Lippa, 2009).

Masculine normative scripts. The gender role norms model posits that sociocultural influences, particularly the influence of the most dominant or powerful groups in a society, shape the gender role expectations and standards that constitute gender role norms (Mahalik, 2000). These socially constructed masculine norms, or ‘scripts’, develop over time, through that behavior which is rewarded and reinforced by others (Mahalik, Good, & Englar-Carlson, 2003). Mahalik, Good, and Englar-Carlson (2003) provide a tool for clinicians who work with men in psychotherapy, and provide practical examples of how gender role norms are experienced during psychotherapy. The authors acknowledge that men can be difficult to work with in a therapeutic setting, and the article provides clinicians with a guideline for incorporating gender role norms into their therapeutic work (Mahalik, Good, & Englar-Carlson, 2003). Specifically, the authors acknowledge that masculine identities can be associated with both positive functioning as well as emotional problems. As such, the article translates research on masculine normative behavior into working ‘scripts’ that men are likely to use to describe their experiences in therapy. These scripts are then linked to presenting problems that are likely to come up during psychotherapy, so as to aid the clinician in their preparation of a case conceptualization for their male patient. In addition, these

scripts are also associated with certain positive coping behaviors for men that should also be considered by clinicians (Mahalik, Good, & Englar-Carlson, 2003).

For example, the ‘strong and silent script’, or emotional control, posits that being viewed as unemotional is a key male characteristic (Mahalik, Good, & Englar-Carlson, 2003). Enacting this script helps boys and men live up to masculine role expectations through being stoic and in control of one’s feelings. Research reveals that emotional control is associated with certain benefits in the short-term, such as experiencing less anger and stress when confronted by small stressors in the workplace (Levant et al., 2011). However, the long-term consequences of emotional restriction has been linked to higher levels of depression, anxiety and anger.

The ‘give -’em hell’ script places value on violence and aggressiveness. Such values are typically learned early in life when males are encouraged to fight in order to ‘build character’ and to keep from being bullied (Mahalik, Good, & Englar-Carlson, 2003). Later in life these values may be reinforced by groups that men join that are primarily male, such as a college fraternity or the military, where peer hazing is considered an acceptable way of initiating men into an exclusive club. While this script may result in short-term gains such as peer recognition or popularity, research reveals that men who conform to violence norms are more likely to report somatic complaints, irritability and are more likely to commit domestic violence against a partner (Mahalik, Good, & Englar-Carlson, 2003).

The ‘winner’ script places value on being successful and competitive (Mahalik, Good, & Englar-Carlson, 2003). Research has revealed a protective aspect of this masculine script, such that men who endorse this norm are less likely to abuse

substances (Levant et al., 2011). This is likely due to the negative impact of substance use on one's ability to thrive in a competitive setting such as the workplace or the athletic field. However, men who endorse and adhere to this masculine norm are also more likely to display controlling and rigid interpersonal behavior, to be hostile towards others, and to feel uncomfortable in social situations (Mahalik, Good, & Englar-Carlson, 2003).

The 'independent' script, or self-reliance, refers to the drive to accomplish tasks on one's own accord (Mahalik, Good, & Englar-Carlson, 2003). Behaviors associated with this norm include not wanting to rely on others for help or assistance of any kind. Long-term consequences of self-reliance include increased levels of depression, anxiety and less willingness to seek help for psychological symptoms (Mahalik, Good, & Englar-Carlson, 2003).

The 'homophobic script', or heterosexual presentation, upholds that the traditional way of being masculine is to avoid features of femininity and homosexuality (Mahalik, Good, & Englar-Carlson, 2003). This manifests itself as avoiding intimate connections with other men, and looking down upon those who have them. Enacting this script has been linked to increased levels of paranoia, as well as feelings of inadequacy (Mahalik, Good, & Englar-Carlson, 2003).

Four additional scripts include valuing work over other areas of one's life ('primacy of work'), valuing sex without intimacy ('playboy'), taking risks ('tough-guy') and viewing women as subordinates to men ('power over women') (Mahalik, Good, & Englar-Carlson, 2003).

Degree of conformity to masculine norms. The final important piece of the gender role norms theory states that men's experience of these gender normative behaviors is filtered through group and individual factors, such as one's socioeconomic status and racial identity (Mahalik, 2000). These group and individual factors in turn affect the extent to which the individual conforms, or does not conform, to specific masculine norms (Mahalik, 2000). Conformity to masculine norms measures the degree to which men rigidly adhere to such socially constructed masculine norms (Mahalik, Locke, et al., 2003; Parent & Moradi, 2009).

Costs and benefits of conforming to masculine norms. Men who endorse such norms are more likely to conform to them, and as previously alluded to, the degree of conformity to traditional masculine norms produce a range of benefits and costs to the individual. In some instances, conforming to the aforementioned masculine norms has been associated with health benefits such as using exercise to cope with depressive symptoms and an increased ability to cope with stress and anger (Levant et al., 2011; Mahalik & Rochlen, 2006). In some instances, these socialized masculine norms can create negative consequences for a person who rigidly adheres to them, including physical problems, unwanted psychological symptoms, and more negative attitudes towards seeking professional help (Green & Addis, 2012; Levant et al., 2011; Mahalik & Rochlen, 2006; Wong, Owen, & Shea, 2012).

Conforming to masculine norms and help-seeking. Men who report higher levels of conformity to masculine norms report more negative attitudes towards seeking help and support from professionals such as psychologists (Berger, Addis, Green, Mackowiak, & Goldberg, 2013; Levant et al., 2011; Levant et al., 2009; Vogel et al.,

2011). Higher levels of conformity were also associated with negative attitudes towards seeking psychological help among adult males and undergraduates (Berger et al., 2013; Burns & Mahalik, 2011). Similarly, undergraduate males who strictly adhere to these norms were less likely to utilize mental health professionals for their psychological symptoms (Green & Addis, 2012; Levant et al., 2011). Men are also less likely than women to hold favorable attitudes towards seeking help from mental health professionals (Gonzalez, Alegria, & Prihoda, 2005).

With regards to specific psychological symptoms and diagnoses, research suggests that men are less likely to utilize mental health services in response to symptoms of depression (Carpenter & Addis, 2001). One recent study investigated men's most and least likely behavioral response to an episode of depression (Mahalik & Rochlen, 2006). Subjects were given twenty possible actions they could take in response to a vignette describing an episode of depression, and each subject was asked to rate each one from 0-3, with '0' corresponding to 'very unlikely' and '3' corresponding to 'very likely' (Mahalik & Rochlen, 2006). The subject's conformity to masculine norms was also assessed. Examples of the behavioral responses to depression included 'contact a mental health professional about the problem', 'have a few drinks', 'talk to your wife or partner' and 'join an anonymous Internet forum or chat room to discuss the problem.' Results revealed that men who report high conformity to masculine norms, were significantly less likely (than those who reported low conformity to masculine norms) to talk to their wife/partner about the problem, or to talk to a mental health professional about the problem (Mahalik & Rochlen, 2006). These findings suggest that strict adherence to socially constructed masculine norms

may prevent weightlifters from disclosing their APED use and mental health symptoms (if present) to physicians or psychologists. Nondisclosure is problematic because it prevents individuals from getting the help they need to address the problem. This will often exacerbate the initial problem, and may cause additional problems to develop as a result (Burns & Mahalik, 2011).

Conforming to masculine norms and negative psychological effects.

Conformity to masculine norms correlated negatively with life satisfaction and positively with aggression (Cohn & Zeichner, 2006; Good et al., 2006). Strict adherence to masculine norms is also related to higher levels of general psychological distress, including elevated levels of depression, somatic complaints and irritability (Blashill & Vanderwal, 2009; Good & Wood, 1995; Good, Dell, & Mintz, 1990; Green & Addis, 2012; Magovcevic & Addis, 2008; Mahalik, Good, & Englar-Carlson, 2003). Among male veterans, those who conform strongly to masculine norms report more severe symptoms of PTSD (Morrison, 2012). Males with increased levels of conformity are more likely to report significantly more anger than those who score on the lower end of the range (Blazina & Watkins, 1996). Men who endorse the masculine norm of self-reliance are more likely to report higher levels of anger and stress (Levant et al., 2011). Additionally, men that were high in adherence to the norm of emotional control endorsed higher levels of depression both concurrently and prospectively, even after controlling for attributional processes (Syzdek & Addis, 2010). It is important to note that strict adherence to masculine norms is merely associated with the aforementioned effects of anger and depression, but adherence to these norms cannot be cited as the cause of these effects.

Conforming to masculine norms and negative health effects. Conforming to traditional masculine norms is also associated with numerous negative health outcomes. Men who report a higher conformity to masculine norms are more likely to engage in violent behavior than men who report lower conformity to such norms (Mahalik, Good, & Englar-Carlson, 2003). In terms of substance use, men who adhere strictly to masculine norms are more likely to abuse alcohol, tobacco products and marijuana (Levant et al., 2011; Liu & Iwanmoto, 2007; Mahalik, Levi-Mintz, & Walker, 2007). Men who conform strictly to masculine norms are also less likely to seek out preventative healthcare measures such as obtaining annual measurements of their blood pressure and cholesterol levels, and receiving cancer screening (Morrison, 2012). With regards to general health promotion behaviors such as exercising at least 30 minutes a day, obtaining an annual physical exam and eating at least five servings of vegetables a day, men with high conformity to masculine norms were less likely to engage in these behaviors (Levant et al., 2011; Mahalik et al., 2007). These findings suggest that strict adherence to socialized gender norms may be associated with negative health outcomes among male APED users. It is important to note that fewer studies exist regarding the association between negative health outcomes and conformity to masculine norms, when compared to the larger amount of literature examining the psychological effects of conforming to masculine norms. As such, only a few studies cited here are driving the overall shape and content of the results in this area.

Conforming to masculine norms and positive physical/psychological effects.

As previously mentioned, conformity to masculine norms has been cited as having some physical and mental health benefits for men. In response to depression symptoms,

undergraduate men who endorse traditional masculine norms are more likely to exercise as a coping mechanism than those who do not endorse these norms (Mahalik & Rochlen, 2006). This association between high conformity and the likelihood of engaging in physical exercise was also observed among male veterans with PTSD symptoms (Morrison, 2012). Adherence to specific masculine norms has also been associated with benefits. For example, men who endorse emotional control and primacy of work are less likely to report anger and stress (Levant et al., 2011). This suggests that controlling one's emotions and making work a top priority in one's life helps men to avoid becoming angry over everyday stressors. In addition, the masculine norm of winning was associated with lower levels of substance use among men, while primacy of work was associated with an increase likelihood of utilizing preventative healthcare (Levant et al., 2011). This suggests that the drive to be successful at work and be more productive than other individuals could lead men to take better care of themselves physically by abstaining from using alcohol and having annual physical exams. Stronger endorsement of masculine norms of risk-taking and primacy of work has been associated with greater personal courage, endurance and resilience among adult men (Hammer & Good, 2010). Finally, men who have sustained significant physical injuries show greater recovery progress when they endorse masculine norms of emotional control and primacy of work (Schopp, Good, Mazurek, Barker, & Stucky, 2007).

Summary of costs and benefits of conforming to masculine norms. In summary, men experience costs and benefits from strictly adhering to masculine norms. In terms of costs, men who conform strictly to socially constructed gendered norms are

more likely to report psychological symptoms such as depression, and are more likely to abuse alcohol and tobacco products (Mahalik et al., 2007; Syzdek & Addis, 2010).

These men are also less likely to seek professional psychological health for their problems (Levant et al., 2011). However, conforming to masculine norms does provide some benefits. Men who strictly conform to masculine norms report less anger and stress at work, and experience faster recovery from physical injuries (Levant et al., 2011; Schopp et al., 2007).

Construct of masculinity. Multiple instruments have been created to measure masculine gender socialization as a construct, and three in particular have been found to be associated most frequently with health behavior and attitudes towards seeking psychological help (Levant et al., 2009). They are: The Gender Role Conflict Scale (O'Neil, Good, & Holmes, 1995; O'Neil, Helms, Gable, Laurence, & Wrightsman, 1986), The Masculine Role Norms Inventory-Revised (Levant et al., 2007) and the Conformity to Masculine Norms Inventory (Mahalik, Locke, et al., 2003; Parent & Moradi, 2009). While each one has a somewhat different aim, they are all based upon the social constructionist view of masculinity that emphasizes the social and cultural transmission of gender-normative behavior (Levant et al., 2009).

A recent study revealed that while all three masculinity measures were significantly associated with attitudes towards seeking psychological help for their ailments, the CMNI was found to contribute uniquely to the variance explained for this population. In this same study, two subscales of the CMNI, emotional control and self-reliance, were significantly correlated with health risks (Levant et al., 2009).

The GRCS has been included in many important research articles on men and masculinity. However, the theory behind the GRCS emphasizes the stress associated with thoughts and behaviors that conflict with traditional masculine norms, thus pathologizing the impact of ‘non-traditional’ male behaviors. In contrast, the CMNI focuses on the conformity or nonconformity to masculine norms, allowing for the possibility that in some instances conformity to traditional norms may be beneficial to the individual.

The MRNI is slightly longer than the CMNI, with 53 items as opposed to 46. In an attempt to keep the survey as concise as possible, the MRNI was excluded for consideration for our study. In addition, the CMNI has empirical support for nine subscales, while the MRNI has support for just seven. More subscales with the CMNI allows for the exploration of a larger number of potentially salient masculinity norms.

Summary of literature and rationale for current study. APED use yields certain physical benefits for men including increases in muscle strength, as well as psychological benefits such as increases in confidence (Hartgens & Kuipers, 2004). APED use has also been associated with certain negative physical effects on the heart, the liver and hormone production, though some effects are dose-dependent and reversible upon cessation (Hoffman & Ratamess, 2006). Despite some methodological limitations, APED use has also been associated with negative psychological symptoms, though the long-term effects are largely unknown (Kanayama et al., 2008).

Despite the documented risks associated with APED use, few users trust health professionals enough to disclose their usage patterns to them (Pope et al., 2004). Existing literature on socially constructed gender norms informs negative attitudes

towards seeking help among men in general (Mahalik, Good, & Englar-Carlson, 2003). Conforming to socially constructed masculine norms is associated with certain negative effects such as increased levels of depression and negative attitudes towards seeking help for such problems (Berger et al., 2013). Conformity to masculine norms also provides certain benefits to men such as experiencing less anger and stress at work, and faster recovery from physical injuries (Levant et al., 2011; Schopp et al., 2007).

Taken together, certain hypotheses can be constructed given what we know about help-seeking attitudes and masculine norms among men in general, and what remains to be understood regarding certain attitudes and behaviors among APED using men.

Statement of Specific Hypotheses and Predictions

Hypothesis one. APED-using men who rigidly adhere to masculine norms (i.e. higher scores on the Conformity to Masculine Norms Inventory-46) are more likely than those who do not conform to such norms, to have a negative view towards seeking help from a professional psychologist (i.e. lower scores on the Attitudes Towards Seeking Professional Psychological Help Scale-Short Form).

Hypothesis two. APED-using men with higher levels of conformity to masculine norms are less likely than those who do not conform to such norms, to endorse health promotion behaviors (i.e. lower scores on the Health Behavior Inventory-20).

Hypothesis three. Conforming to masculine norms and attitudes towards seeking professional psychological help scale will predict health promotion behavior (as measured by the Health Behavior Inventory-20).

Method

Data Collection

Participants were recruited between August 2013 and April 2014 from Internet sites with discussion forums that focus on APEDs, physical fitness and bodybuilding. Links to the web-survey were posted to both moderated, unrestricted public message boards, as well as discussion forums that require membership to obtain access. Visitors to these discussion forums were informed about a survey being conducted by a group of researchers at a large University who are interested in the role of APEDs, as well as exercise routine and diet, in the lives of bodybuilders, powerlifters and other people who seriously train. Powerlifting is a type of strength training in which the athlete attempts to complete a specific lift/exercise with the maximum amount of weight possible. Visitors to the discussion forums were also informed that the study would take approximately 30-40 minutes to complete, and is completely confidential. They were further informed that no names, addresses or other identifying information about the respondent would be collected. Potential participants were invited to click on a hyper-link in order to access the survey. The measure can be viewed at: https://acsurvey.qualtrics.com/SE/?SID=SV_e5MKoBh7KGO5cWh). Once they clicked on the hyper-link, they were re-directed to the data instrument, which resides on

the confidential web-server of Qualtrics.com, a leading global supplier of data collection.

The survey components. The instrument totals 318 questions, and covers 13 major categories. The categories are: background and demographics, APED usage patterns (cycle vs. always-on), training history and identity, dietary and health behaviors, anabolic abstinence syndrome, attitudes towards seeking professional psychological help, masculinity questions, sex behavior, drug behavior (non-APED), impulsivity, DSM-IV criteria questions, social APED network, and intentions of future APED use. This on-line instrument is based largely on the Appearance and Performance Enhancing Drug Use Schedule (APEDUS), which is a semi-structured interview designed to assess the core drug and non-drug use behaviors associated with APED use (Hildebrandt, Langenbucher, Lai, Loeb, & Hollander, 2011). The instrument uses conditional skip logic, in which the question the respondent sees next depends on the answer they select in a single-select multiple choice question. This format allows participants to skip sections and questions that were not relevant to their usage patterns. Three attention filters were added to the survey to track the participants' focus and attention while answering the questions. For example, one of the filters states: 'this is an attention filter: please select strongly agree.'

Background and demographics. This section asked the participants to report basic characteristics and demographic information about themselves. Participants reported their age, height, weight, age, ethnicity, education level, employment status, sexual orientation and income. They were also asked certain health-related questions such as whether they track their body fat with reasonable accuracy, whether they are

receiving mental health treatment of any type and whether they have been diagnosed with a heart condition.

APED usage patterns. The purpose of these questions was to gather a general sense of the participants' experiences using substances to improve their appearance or alter their performance. An initial question queried whether they had ever used APEDs, such as anabolic steroids, non-steroidal agents, or powerful thermogenics. Participants who answered 'yes' to this question were then asked to select one of two 'usage patterns' with regards to their APED use. The two usage patterns were described as 'cycling' or 'always-on', and definitions were provided for clarification. 'Cycling' refers to a pattern that includes the use of steroidal and/or non-steroidal anabolics, followed by a period of discontinuation to let the body recover. The second usage pattern, referred to as 'always-on', is defined as a prolonged period of time in which one takes a continuous dose of steroidal and/or non-steroidal anabolics, without a period of discontinuation. Participants were also asked whether they used APEDs because of a medical condition.

Regardless of which usage pattern the participants selected, they were asked a series of related questions about their APED usage. Participants who cycle were asked to answer all questions based on the most recently completed (or current) cycle, while always-on participants were asked to answer all questions based on APED use over the past 4 months. Previous studies suggest that the average length of a cycle is 16 weeks (Hildebrandt et al, 2007). Thus, for ease of comparison to those who cycle, the 'always-on' subjects were asked to focus on this specific length of time.

Subjects who endorsed cycling as their primary pattern of usage, were then asked 24 questions to gather more information about their current or most recent cycle they had completed. Participants were asked whether they were currently on-cycle, and the total number of cycles they have completed in their life. Participants who cycle APEDs were presented with a list of 11 commonly used oral APEDs, 20 commonly used injectable APEDs and five commonly used ergo/thermogenics, and were asked to provide the duration (in weeks) and dosage amount (dose in mg/IUs per week) for the ones they had used during their most recent cycle. In addition, a list of commonly used ancillary drugs were presented, and participants were asked which if any they used during their cycle or shortly after to reduce the side effects of APED use. Participants were also asked whether they ‘bridge’ between cycles. Bridging refers to a high-dose pattern of use that includes steroidal and/or non-steroidal anabolics, followed by a low-dose, or ‘bridge’, in-between high-dose periods. They were also asked to estimate the average percentage increase or decrease in strength they experienced across all of the exercises/lifts during their most recent cycle. The total cost in dollars of the substances used during their most recent cycle was queried. Benefits such as increased confidence in appearance and increased sex drive were assessed, as were negative side effects such as unwanted changes in appearance (i.e. acne, gynecomastia). Finally, participants were asked if they sought the help of a health professional, a non-professional (trainer, experienced APED user) or the Internet during their current or most recent cycle.

Participants who reported being ‘always-on’ APEDs were asked a series of similar questions about their APED usage with regards to the type and dosage of APEDs used, the average increase or decrease in strength, the total cost of substances

and the benefits/negative side effects of use. While the content of the questions were similar to those that were asked of those who cycle, the timeframe being queried was different. These participants were asked to answer questions based on their pattern of APED use over the past 4 months.

Training history and identity. This set of questions focused on the participants' athletic and training practices and what these practices mean to them. Participants were asked to describe their primary method of exercise or training, as well as details about the frequency and duration of their training sessions.

Dietary history and health behaviors. Participants were asked a set of questions that focused on their diet, the food they eat and how they make decisions about their diet. They were asked whether they attempt to control their diet, and their perceived success in controlling their diet. Participants were asked twenty statements about their attitudes and behaviors towards their health, with a 7-point likert scale ranging from strongly agree (7) to strongly disagree (1). These questions constitute the Health Behavior Inventory – 20, which is a shortened version of the Health Risks Inventory, which was specifically designed to investigate male health behaviors (Courtenay, McCreary, & Merighi, 2002; Levant et al., 2011). The benefits of the measure are that it assesses not only health promotion behaviors, but also health-risk behaviors and utilization of preventative healthcare, in a short, concise manner. The Health Behavior Inventory - 20 has been shown to have adequate psychometric properties, and has been utilized in previous studies examining the relationship between masculine norms and health promotion behavior (Levant et al., 2011)

Anabolic abstinence syndrome. This section listed a number of abstinence symptoms, and participants were asked whether they experienced them following the completion of their most recent cycle, or the last time they discontinued using APEDs. The abstinence symptoms that were queried included physiological changes (e.g., decrease in strength), cognitive changes (e.g., decrease in ability to concentrate), changes in affect (e.g., decrease in sense of well-being) and interpersonal changes (e.g., social withdrawal).

Attitudes towards seeking professional psychological help. Participants were given 10 statements regarding attitudes towards seeking professional psychological help, and asked to indicate the degree to which they agree or disagree with the statement, on a 4-point likert scale (Fischer & Farina, 1995). These statements constitute the Attitudes Towards Seeking Professional Psychological Help – Short Form, which is a shortened version from the original measure that included 29 items (Fischer & Farina, 1995; Fischer & Turner, 1970). Numerous studies have documented psychometric support for this measure (Constantine, 2002; Komiya, Good, & Sherrod, 2000; Vogel, Wester, Wei, & Boysen, 2005), and it is the only standardized instrument assessing mental health treatment attitudes that has been both psychometrically examined and used in a sizeable number of studies (Elhai, Schweinle, & Anderson, 2008). This measure has been used extensively in literature examining the relationship between help-seeking behavior and conformity to masculine norms among men (Berger et al., 2013; Levant et al., 2009; Vogel et al., 2011). This measure has also been used to examine the relationship between attitudes towards seeking professional psychological

help and both physical and mental health symptoms (Levant et al., 2011; Mahalik, Locke, et al., 2003).

Masculinity questions. Participants were presented with 46 statements about how men think, feel or behave, and they constitute the Conformity to Masculine Norms Inventory - 46 (Parent & Moradi, 2009). This measure represents the revised and abbreviated version of the original Conformity to Masculine Norms Inventory, which was comprised of 96 items (Mahalik, Locke, et al., 2003). The statements are designed to measure the participant's conformity (or lack of conformity) to attitudes, beliefs and behaviors associated with both traditional masculine gender roles. After reading each one, participants were asked to select whether they strongly agree, agree, disagree or strongly disagree with the statement. The measure consists of nine subscales, which represents the recent shift from examining masculinity as a unidimensional construct, towards a more complex construct with multiple dimensions (Wong et al., 2012). This measure has been used extensively in studies to examine the psychological functioning and physical health of men (Green & Addis, 2012; Levant et al., 2011; Levant et al., 2009; Mahalik & Rochlen, 2006; Wong et al., 2012). It is also one of the three most often utilized measures in masculinity research, and has been shown to have strong psychometric support (Levant et al., 2009; Parent & Moradi, 2011).

Sexual compulsivity. The Sexual Compulsivity Scale was developed to assess tendencies toward sexual preoccupation and hypersexuality (Kalichman & Rompa, 1995). Participants were asked a number of statements about their sexual behavior and sex-related thoughts, and were asked to report how much the statement is or is not like them, on a 4-point likert scale.

Drug behavior (non-APED). The Drug Use Questionnaire (DAST-20) assesses the participants' potential involvement with drugs, not including alcoholic beverages, during the past 12 months (Skinner, 1982). Participants were asked to simply answer 'yes' or 'no' in response to each one.

Aggression. Participants were presented with twelve statements from the Buss-Perry Aggression Questionnaire (BPAQ-SF) that assess for the behavioral, emotional and cognitive manifestations of aggression (Buss & Perry, 1992; Diamond & Magaletta, 2006). They were then asked to indicate how much a given statement reflects their experience, using a 4-point likert scale.

DSM-IV questions. These nine questions aim to capture the diagnostic criteria for substance abuse and substance dependence as described in the Diagnostic and Statistical Manual of Psychological Disorders – Fourth Edition TR (DSM-IV-TR) (APA, 2000). Each question utilizes APED use as the substance in question. Although the DSM-IV has a total of 11 combined abuse/dependence criteria, only nine questions were deemed relevant for APED users.

Social APED context. A set of six questions target the participants' general experience as an APED user, and the degree to which their APED use is connected to a community or culture of APED use. Participants were asked how frequently they discuss their APED use with people they know well (e.g. friends, family members) and people they only know through the Internet (e.g. people who are anonymous but will share knowledge of training and drug use). Two additional questions asked how often they give advice or provide counseling to other APED users regarding their use patterns, and the total number of people they know who use APEDs.

Risk and future use. The final questions focused on intentions for future APED use, as well as circumstances in which discontinuation of APED use would be likely. Participants were asked to provide the likelihood that they would continue to use APEDs, if they were given indisputable evidence that APED use leads to severe health effects. In addition, participants were asked how many years of their life they would be willing to sacrifice, in return for the immediate achievement of all their fitness and/or weight-training goals.

Additional survey information. Three attention filters were added to screen out participants who were answering the questions without reading them. For example, one filter was placed on a 4-point likert scale which read ‘this is an attention filter, please select ‘Agree.’ In addition, participants who responded ‘no’ to the question ‘have you ever used appearance or performance enhancing drugs’ were not asked about their APED use pattern, side effects of APED use, social APED network and risk of future APED use. Non-APED users were however asked about their training behavior, dietary behavior, attitudes towards seeking professional psychological help, conformity to masculine norms, sexual behavior, other drug-use behavior and impulsivity.

All participants gave informed consent and indicated that they were at least 18 years of age by clicking the appropriate box on the Statement of Informed Consent which constituted the first page of the instrument. Participants who were under 18 years old were not allowed to take the survey. The Rutgers University institutional review board approved the procedures of this study, the content of the survey, the content of the advertisement and the recruitment strategy. Upon completion of the

survey, all participants were informed that their information had been submitted, and were thanked for their participation.

Six hundred participants began the survey, and 264 completed it. This yielded a completion rate of 44.0%. The median time to completion was approximately 36 minutes and 18 seconds. The median time was used because approximately 15 respondents took more than 2 hours to complete the survey, and their time significantly skewed the average completion time. Six of the participants who completed the survey were female, and thus their data were eliminated. An additional 47 participants reported that they had not used APEDs, and their data were also eliminated. Finally, 18 participants did not answer the attention filter correctly, and thus, their data were also eliminated from the total. This resulted in a unique sample of 193 men who report having used APEDs.

Participants

Demographics for the 193 subjects in the APED-user sample are reported in Table 1. The majority of the participants were between the ages of 25-44 (25-34 = 27.5%, 35-44 = 27.5%) and were predominantly White/Caucasian (89.6%). Most participants were married (36.8%), high school graduates (36.3%), and earned between \$50,000 and \$100,000 (34.7%) in annual income.

Instruments

Conformity to masculine norms inventory – 46 (CMNI-46). The Conformity to Masculine Norms Inventory (Mahalik, Locke, et al., 2003) was used to measure

participants' conformity to masculine norms, and it was scored according to the CMNI-46 (Parent & Moradi, 2009). The CMNI-46 is composed of 46 items scored for nine subscales: Emotional Control, Heterosexual Self-Presentation, Playboy, Power Over Women, Primacy of Work, Risk-Taking, Self-Reliance, Winning and Violence. CMNI-46 items are rated on a 4-point likert scale ranging from 0 (strongly disagree) to 3 (strongly agree) and appropriate items are reverse-scored. Higher average scores indicate greater conformity to masculine norms reflected in both the total score and each subscale. Parent and Moradi (2009) report strong evidence of consistency between the CMNI-46 and the original CMNI. Cronbach's alphas for the CMNI-46 subscales ranged from .77 to .91 (Mdn = .84), and the alpha for the CMNI total scale was .88 (Parent & Moradi, 2009).

Attitudes towards seeking professional psychological help – short form (ATSPPH-SF). The Attitudes Toward Seeking Professional Psychological Help - Shortened Form (ATSPPH-SF) was used to measure opinions of counseling and psychotherapy (Fischer & Farina, 1995). The ATSPPH-SF is a revision of Fischer and Turner's 29-item scale for measuring attitudes toward seeking professional psychological help (Fisher & Turner, 1970). The ATSPPH-SF shows a .87 correlation with full-scale scores derived from the original form. It consists of 10 statements rated on 4-point Likert Scales ranging from 0 (Strongly Disagree) to 3 (Strongly Agree), with higher scores suggesting more positive attitudes toward seeking professional psychological help (Fischer & Farina, 1995).

Health behavior inventory – 20 (HBI-20). To assess health behaviors we used the HBI-20, which resulted from modifications to the Health Risk Inventory

(Courtenay, 1998; Courtenay et al., 2002), and consists of a 20-item, five-subscale instrument. Three subscales reflect health-promoting behaviors: Diet (five items), Preventive Care (seven items), and Medical Compliance (two items). Two reflect health risk behaviors: Anger and Stress (three items), and Substance Use (three items). The health risk items are reverse-scored, so that high scores on all subscales indicate a greater degree of health promotion and risk avoidance. Respondents are asked to rate the extent to which each item was self-descriptive, using a 7-point scale ranging from 1 (always) to 7 (never).

Design and Analyses

The confidential information gathered from the all responses to the survey was exported from the secure Qualtrics site to an excel document. Because no identifying information was collected, the responses are demarcated from one another using a randomly generated ‘response ID’ created by Qualtrics. The time when each respondent began and completed the survey was also recorded. As per the informed consent, participants are permitted to discontinue the survey at any time by closing the web browser. As such, partial responses from incomplete surveys were recorded. Information was retained from respondents who had completed the survey, and these data were sorted based on their answer to the question ‘Have you ever used appearance or performance enhancing drugs...?’ Data were retained from respondents who endorsed having used appearance and performance enhancing drugs. In addition to descriptive statistics regarding their APED and demographic information, their unique responses to each of the three target measures were collected: the Health Behavior

Inventory-20 (HBI-20), the Attitudes Towards Seeking Professional Psychological Help-Short Form (ATSPPH-SF) and the Conformity to Masculine Norms Inventory-46 (CMNI-46).

Data analyses. Mean scores and standard deviations on each of the three target measures were calculated. In addition, means and standard deviations were calculated for all nine of the subscales on the CMNI-46.

Data analyses for hypotheses one and two. A bivariate correlation analysis was utilized in order to test the first hypothesis that APED using men who rigidly adhere to masculine norms are more likely to have a negative view towards seeking help from a professional psychologist. This involved indexing the degree to which the mean scores on the CMNI-46 are related to the mean scores on the ATSPPH-SF for each respondent, using a Pearson 'r' correlation coefficient. A Pearson 'r' was calculated to index the degree to which each of the nine mean subscale scores of the CMNI-46 were related to the mean score for the ATSPPH-SF. A power analysis was then conducted to determine the ability of the test to determine an effect, if one exists. A similar analysis was completed for the second hypothesis, exploring the relationship between conformity to masculine norms (CMNI-46) and health promotion behavior (HBI-20).

Data analysis for hypothesis three. A multiple linear regression was utilized to test the third hypothesis that conforming to masculine norms and attitudes towards seeking professional psychological help scale will predict health promotion behavior. That is, the calculated regression equation allows for the prediction of scores on the HBI-20, using scores from the CMNI-46 and ATSPPH-SF as predictor variables. The regression equation is a formula for a straight line, and it minimizes the sum of the

squared deviations between the actual scores that APED users reports on the HBI-20, and the predicted values based on their CMNI-46 and ATSPPH-SF scores (Harris, 1998). An additional power analysis was conducted to determine the ability of this test to determine an effect, if one exists.

Results

APED Sample

The average height of the subjects was approximately 70.1 inches, and the average weight was approximately 212.5 pounds. Approximately 66.3% (n=128) of all subjects reported that they track their body fat with reasonable accuracy, and of this subset, the average body fat percentage was approximately 13.6%. Of the 196 men in the sample, approximately 71.5% (n=138) reported that they cycle steroidal and non-steroidal anabolics, while 28.5% (n=55) reported that they are ‘always-on’ some anabolic agent. Of the 138 respondents who cycle, approximately 42% (n=61) were currently on-cycle, 55.8% (n=77) were off-cycle, and approximately 29.0% (n=40) ‘bridge’ between cycles. The average age when the subjects’ first began using APEDs was 31.7 years old (29.4 years-old for those who cycle, 34.0 years-old for those who are always-on). Subjects completed an average of 6.8 cycles in their life (median of 4.0 cycles), with an average duration of 11.8 weeks (median 12.0 weeks). Previous research using an earlier version of the APEDUS revealed that APED users had completed an average on 5.8 cycles in their lifetime, with an average duration of 7.5 weeks for oral APEDs and 13.9 weeks for injectable APEDs (Hildebrandt et al., 2007).

With regards to fitness goals and identity with regards to APED-use, approximately 48.7% (n=94) of participants consider themselves to be a recreational weightlifter, whose workout routine is focused on staying in-shape and maintaining a healthy lifestyle. These recreational weightlifters use APEDs occasionally, and for a shorter duration and at a lower dose than other people in their social network who use APEDs. Approximately 33.7% (n=65) identify as a bodybuilder, and lift weights with the goal of achieving both leanness and size/bulk simultaneously. In addition, those who identify as bodybuilders typically use more than one type of APED, for a longer duration of time and at a higher dose than those other people in their social network who use APEDs. Approximately 8.8% (n=17) focus on the goal of achieving an increase in size over leanness, while an additional 8.8% (n=17) focus on the goal of achieving an increase in leanness over size/bulk.

The majority of participants (59.1%, n=114) spent between \$0-499 on APEDs during their current or most recent cycle (or during the past 4 months for those who are always-on APEDs), while 25.4% (n=49) spent between \$500-\$999, and 10.9% (n=21) spent between \$1,000-\$1,499. Approximately 4.7% (n=9) spent more than \$2,000 on APEDs.

With regards to the degree to which the participant is connected to a community of other APED users, participants report knowing an average of 11.0 people who use APEDS. Approximately 30.1% discuss their APED use with people they know well (i.e. friends, family members) at least once a month, while another 23.3% report discussing their APED use with people they know several times a week. In addition, 20.2% discuss their APED use with people they know through the Internet

approximately once a month. Further, 21.8% give advice or provide counsel to other APED users regarding their use patterns or managing side effects about once a month.

Of the APED sample, approximately 11.0% report seeking the help of a health professional to manage the side effects or consequences of their use. Health professionals include non-MD professionals, including counselors, nurses and nurse practitioners. Furthermore, 27.9% sought help from non-professionals, including trainers, coaches or experienced users, to help manage the side effects or consequences of their use. In contrast, 68.1% sought help from the Internet to manage side effects or consequences of APED use.

Hypotheses One and Two: Correlational Analyses

Hypothesis one: APED-using men who conform to masculine norms will report negative attitudes towards seeking professional psychological help.

Descriptive statistics and bivariate correlations are presented in Table 2. The mean score on the CMNI-46 for the APED sample is 1.4 (SD=0.35), while the mean score on the ATSPPH-SF was 1.9 (SD=0.50). Higher scores on the CMNI-46 indicate more conformity to masculine norms, and higher scores on the ATSPPH indicate more positive attitudes towards seeking professional psychological help. A scatterplot comparing the mean scores on the CMNI-46 to the mean scores on the ATSPPH-SF is presented in Figure 1. A strong significantly negative correlation was observed between conformity to masculine norms and attitudes towards seeking professional psychological help ($r = -.363, p < .01$). This supports hypothesis one. These data suggest that APED-using men who endorse and conform to traditional masculine norms

are more likely than those who do not conform to such norms, to report negative attitudes towards seeking professional psychological help.

Subscale scores were calculated for each of the nine subscales of the CMNI-46. Five of the subscales were significantly negatively correlated with the overall mean score for help-seeking attitudes based on the ATSPPH-SF: emotional control ($r = -.426$, $p < .01$), violence ($r = -.279$, $p < .01$), power over women ($r = -.287$, $p < .01$), self-reliance ($r = -.301$, $p < .01$) and heterosexual self-presentation ($r = -.300$, $p < .01$). These data suggest that APED-using men who conform to the masculine norms of emotional restraint, violence, power over women, self-reliance and heterosexual presentation, are more likely to report negative attitudes towards seeking professional psychological help.

According to Cohen, 84 pairs of data are needed in order to have an 80% chance of detecting a medium effect ($r = +/- .3$), if one exists (Cohen, 1992). The correlation between conformity to masculine norms and attitudes towards help-seeking ($r = -.363$, $p < .01$) is a medium effect, and thus, there is adequate power to detect this significant medium effect with the 193 respondents in our sample. Similarly, three subscales of the CMNI-46 have medium effects (emotional control, $r = -.426$; self-reliance, $r = -.301$; heterosexual self-presentation, $r = -.300$), and thus, there is adequate power to detect these significant medium effect relationships.

Hypothesis two: APED-using men who conform to masculine norms will not engage in health-promotion behaviors. A scatterplot comparing the mean scores on the CMNI-46 to the mean scores on the HBI-20 is presented in Figure 2. Higher

scores on the HBI-20 indicate a greater degree of health promotion behavior and risk avoidance. A significantly negative correlation was observed between conformity to masculine norms and health-promotion behavior ($r = -.338, p = .01$). These data suggest that APED-using men who endorse and conform to traditional masculine norms are less likely than those who do not conform to such norms, to engage in health-promotion behaviors.

As mentioned, subscale scores were calculated for each of the nine subscales of the CMNI-46. Six of the subscales were significantly negatively correlated with the overall mean score for health promotion behavior based on the HBI-20: emotional control ($r = -.236, p < .01$), violence ($r = -.296, p < .01$), power over women ($r = -.303, p < .01$), self-reliance ($r = -.301, p < .01$), playboy ($r = -.308, p < .01$), and heterosexual self-presentation ($r = -.170, p < .05$). These data suggest that APED-using men who conform to the masculine norms of emotional restraint, violence, power over women, self-reliance, playboy and heterosexual presentation, are less likely to engage in health-promotion behavior. However, one subscale of the CMNI-46 was positively correlated with health promotion behavior: primacy of work ($r = .164, p < .05$). These data suggest that APED-using men who place a high value on the primacy of work in their life, are more likely to engage in health promotion behavior. This points to protective and health aspects of conformity to masculine norms that are often times overlooked in the face of more glaring negative impacts.

As mentioned, 84 pairs of data are needed in order to have an 80% chance of detecting a medium effect ($r = +/- .3$). The relationship between conformity to masculine norms and help-promotion behavior is observed to be a significant medium

effect, with a correlation of $r = -.338$ ($p < .01$). Thus, with the 193 respondents in our sample, there is adequate power to determine this medium effect. Similarly, three subscales of the CMNI-46 have medium effects in relationship to health-promotion behavior (power over women, $r = -.303$; self-reliance, $r = -.301$; playboy, $r = -.308$), and thus, there is adequate power to detect these significant medium effect relationships.

Hypothesis Three: Multiple Linear Regression

Hypothesis three: Conformity to masculine norms and attitudes towards seeking professional psychological help will predict health-promotion behaviors among APED-using men. A multiple regression was conducted to assess the relative role of conformity to masculine norms and attitudes towards seeking help in predicting APED-users' health promotion behavior based on their total HBI-20 score. For the multiple linear regression analysis, total mean scores for the CMNI-46 and ATSPPH were entered, which resulted in an adjusted R^2 of 0.12, R^2 change of 0.12 and $F = 13.13$; $p < .01$. The results are shown in Table 3. Results indicate that conformity to masculine norms, and attitudes towards seeking professional psychological help, are indeed significant predictors of health-promotion behaviors, among males who use APEDs.

According to Cohen, using an alpha of .05, 67 subjects are needed to achieve 80% power to detect a medium effect, ($f^2 = .15$) if one exists, with a candidate set of two independent variables. The f^2 calculation for this regression is calculated to be $f^2 = 0.14$. This regression yields a medium effect, and thus, with our 193 respondents in the sample, there is adequate power to determine this medium effect according to Cohen.

Discussion

APED-using men who endorse and conform to traditional masculine norms are more likely to report negative attitudes towards seeking professional psychological help, thus supporting hypothesis one. This finding supports previous research that has observed this relationship among men (Berger et al., 2013; Burns & Mahalik, 2011; Green & Addis, 2012; Levant et al., 2011; Levant et al., 2009; Vogel et al., 2011). Men who conform to the tenets of five specific socially constructed masculine norms are more likely to have negative view of seeking help from psychological professionals. Two of these socially constructed masculine norms, emotional control and self-reliance, have been associated with negative attitudes towards help-seeking in the past (Mahalik, Locke, et al., 2003). These norms have also been observed to be a risk factor for suicide among U.S. veterans diagnosed with post-traumatic stress disorder (Burns & Mahalik, 2012). The other three socially constructed norms that were significantly associated with negative attitudes towards help were violence, heterosexual presentation and a preference for males as opposed to women to be in positions of power.

Despite the significant negative association between conformity to masculine norms and negative attitudes towards seeking professional psychological help, there is evidence that men who use APEDs rely on support from one another as they navigate their APED use. Our data reveal that APED users frequently share their knowledge of training, dietary practices and/or drug use with other athletes and friends, whether in-person or through the Internet. In fact, 21.8% give advice or provide counsel to other APED users regarding their use patterns or managing side effects about once a month.

A tight-knit community exists among these athletes. These men hold clear mentorship roles for other APED users regarding their usage patterns, and may also provide them with guidance in other areas of life such as stress stemming from interpersonal relationships.

Given the illicit nature of these APEDs, there exists a common distrust of professionals within this population. Contact with medical professionals increases the risk of encountering legal ramifications for their APED use. Of the APED sample, only 11.0% report seeking the help of a health professional to manage the side effects or consequences of their use. In contrast, 68.1% sought help from the Internet to manage side effects or consequences of APED use. These data support the idea that APED users are wary of seeking help from professionals in-general, and prefer instead to rely on the Internet for information to manage their APED use. In addition to the risk of legal ramifications, APED users are likely to be wary of seeking help from professionals who they feel 'don't understand' the culture of anabolics. Further, it is likely that a professional may not understand the underlying mechanisms of action for each substance, as well as the motivations for use.

It is important to recognize that while conformity to masculine norms such as self-reliance and emotional control negatively correlate with help-seeking attitudes, conforming to these normative beliefs may yield other positive results for APED users. For example, training with weights and other athletic endeavors ultimately requires the individual to adhere to a strict regimen of physical activity. While others can support the athlete through Internet message boards regarding methods for training or tips related to APED use, the task of carrying out these fitness goals resides with the

individual. Thus, relying on resources within oneself can serve as a valuable asset when striving to achieve desired results in individual sports such as bodybuilding and weight training. It is important to not pathologize conformity to masculine norms, and additional benefits may exist beyond the scope of this study. In fact, conforming to the masculine norm of primacy of work positively correlates with health promotion behavior in our sample ($r = .164, p < .05$).

Behaviors that are linked to health-promotion are negatively correlated to strict adherence to masculine norms, and the relationship was observed to be significant. This suggests that APED-using men who endorse and conform to traditional masculine norms are less likely to engage in health-promotion behaviors. This confirms hypothesis two, as well as previous research that has observed a significant negative correlation between conformity to masculine norms and health-promotion behavior among men (Levant et al, 2011; Lui & Iwamoto, 2007; Mahalik et al., 2007; Mahalik, Locke, et al., 2003; Morrison, 2012). Participants who conform to such norms are more likely to get angry when they are caught in traffic and more likely to get irritated and mad when waiting in lines. In addition, APED users who conform to masculine norms are less likely to consult a healthcare professional right away when they have unfamiliar physical symptoms and are less likely to go to all of their scheduled healthcare appointments. This confirms what was observed in hypothesis one: APED users have a distrust of medical professionals, and are more likely to rely on information and support from one another.

Limitations

When considering the results of this study, certain limitations need to be considered. First, the participants were recruited from on-line platforms of discussion forums and fitness websites, and thus, the sample represents athletes who use APEDs and participate in these forums. Athletes who do not participate in an on-line community, either due to personal preference or lack of access, are not captured in this sample. On-line communication allows individuals to avoid uncomfortable aspects of face-to-face social interactions, if such aspects exist. Thus, those with a personal preference for on-line communicating may also be less apt to reach out and seek professional psychological help in a face-to-face setting.

Second, the APED users who completed the survey were asked to self-select themselves into two categories that describe their usage pattern: those who rotate periods of use with periods of non-use (cyclers), and those who are always using these drugs. These two usage patterns may not capture the true heterogeneity of usage patterns among APED users, especially within the always-on category. In addition, those who are always-on APEDs were asked to consider only the past 4 months of their use, in order to mimic the length of a typical cycle. The long-term effects of APED for individuals who do not allow for periods of discontinuation are less clear, and thus, this study assumes that it is appropriate to combine this group with users who cycle their APEDs. These limitations must be considered when reviewing the results of this study.

Future Directions

Results from these data pose additional avenues for future research. From a methodology perspective, future web-based surveys may benefit from the utilization of shorter survey instruments for data collection. Results from this study suggest that surveys that take more than thirty minutes to complete will yield a 44.0% completion rate among APED users. Thus, shorter survey instruments are recommended for the collection of data in a more efficient manner among this population. In addition, newer social media outlets such as twitter may be better suited to reach this notoriously difficult to engage population.

More information is needed regarding the content and quality of discussions that are occurring within these strong social APED networks. This study confirms that APED users rely on each other for information about topics related to APED use. This study also confirms that strong social networks do exist among APED users, and that many fulfill the role of mentorship to other less-experienced users, or athletes who are considering using APEDs for the first time. Additional research needs to explore whether more topics are being discussed between mentors and ‘mentees’ in addition to APED-related advice. Currently there is no comprehensive data regarding the content and intimacy of these relationships. It seems likely that a discussion of sexual side-effects occurring as a result of using anabolics, may lead to a related discussion about how these side-effects impact one’s interpersonal and romantic relationships with one’s partner or spouse. If in fact social networks and mentoring within the APED community do provide more benefits to the individuals beyond shared ideas about anabolics, individuals may hold positive attitudes towards seeking-help from peers and

other APED users, despite negative views towards professionals. The net effect of this peer counseling could result in more negative views to seeking professional psychological help, if in fact they perceive that their needs are being met by individuals who they feel they can trust more readily.

This study provides a foundation for the exploration of novel approaches to increasing health-promotion behaviors among APED users, and men in general. The regression analysis confirms that attitudes towards seeking professional psychological help and conformity to masculine norms predict a decrease in health-promotion behaviors among APED users. Thus, one potential avenue is to use a qualified individual within the APED community, who is trusted among peers, who can be an advocate for the importance of healthcare needs to the community. This would be a current or former APED user, who not only has a working knowledge of common APED substances, but also understands the complex interactions of these compounds on the body. He or she would already have established ties within the APED community, thus reducing barriers to entry, and could be an advocate for both psychological help as well as other health-promotion behaviors.

The long-term effects of APED use on both psychological and physical health are still very much unclear (Kanayama et al., 2008). Despite some recent studies that have examined the long-term effects of APEDs on the health of athletes as they enter middle age, the amount and quality of data remains limited (Sjoqvist et al., 2008). Additional research stemming from this study can further examine data concerning these long-term users. Specifically, research could examine the impact of conforming to masculine norms on long-term health promotion behavior among men who report

using APEDs for more than 20 years. Additionally, as mentioned much of the existing literature focuses on dosage levels not typically used by most individuals who self-administer APEDs for recreational and/or training purposes (Pagonis et al, 2006). Because participants in this study reported actual dose amounts, additional research could examine the impact of conformity to masculine norms on health behavior among users who use many different types of APEDs at significantly elevated doses.

For men in general, this study provides further support that conformity to specific masculine norms such as emotional control and self-reliance are negatively correlated with attitudes towards help-seeking behavior. Future research would benefit from the creation of treatment modules for all men, not just APED-users, who conform to these masculine norms, and suffer from specific psychological symptoms. For example, a module could be created for depressed men who adhere strictly to emotional control and self-reliance, and could be included as an addendum to evidence-based treatments such as behavioral activation for the treatment of depression. Similar to the Fairburn Model for the CBT treatment of eating disorders, where certain ‘external’ maintaining mechanisms such as clinical perfectionism and core low self-esteem serve as barriers to symptoms reduction, adherence to specific masculine norms could be treated in a similar manner through additional targeted sessions. Other treatments, such as The Men’s Stress Workshop: A Gender Sensitive Treatment for Depression, have specifically targeted strict adherence to masculine norms using CBT interventions in a group format (Primack, Addis, Sized, & Kohl, 2010). Future research could pilot a CBT treatment module for a specific disorder, and eventually conduct a randomized-controlled trial to test its efficacy and effectiveness.

Finally, additional research is needed to further explore comparisons between different types of APED users in the context of help-seeking behaviors. How do attitudes towards seeking help differ between those who cycle drugs and those who are always-on? Is one group more likely to conform to a specific set of masculine norms? How does this impact their health promotion behavior? Similarly, future research is needed to further explore the difference between homosexual men and heterosexual men in the context of APED use, as it relates to each of the three aforementioned questions for the cycle and always-one groups. Given that homosexual men are more likely to have psychological distress in their lifetime, perhaps their views towards seeking help from professionals is significantly different from those of their heterosexual counterparts. Also, homosexual men may feel less included in the larger APED community, and thus, may create a sub-culture within the APED community of homosexual athletes who use APEDs. This sub-culture, and others if they exist, may yield different results from this sample with regards to help-seeking attitudes and health-promotion behavior.

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Table 1
Sample Demographics

Domain	Description	Freq.	%
Age	18-24	25	13.0%
	25-34	53	27.5%
	35-44	53	27.5%
	45-54	42	21.8%
	55-64	16	8.3%
	Over 65	4	2.1%
Marital Status	Never Married	49	25.4%
	Widowed	2	1.0%
	Divorced	10	5.2%
	Separated	3	1.6%
	Living as Married	20	10.4%
	Married	71	36.8%
Education Level	In a Relationship	38	19.7%
	Some High School	14	7.3%
	High School Graduate	70	36.3%
	Some College or Technical School	65	33.7%
	College Graduate	39	20.2%
	Post-Graduate or Professional	0	0.0%
Employment	Full-time	158	81.9%
	Part-time	10	5.2%
	Homemaker	1	0.5%
	Student Full-time	23	11.9%
	Retired	5	2.6%
	Unemployed	6	3.1%
Income	Disabled	2	1.0%
	Less than \$25,000	22	11.4%
	\$25,000-\$50,000	48	24.9%
	\$50,000-\$100,000	67	34.7%
	\$100,000-\$150,000	32	16.6%
	\$150,000-\$200,000	13	6.7%
Race/ethnicity	\$200,000-\$250,000	3	1.6%
	\$250,000-\$300,000	2	1.0%
	More than \$300,000	6	3.1%
	White/Caucasian	173	89.6%
	Black or African American	7	3.6%
	Hispanic	18	9.3%
Sexual Orientation	American Indian or Alaskan Native	0	0.0%
	Asian	2	1.0%
	Native Hawaiian or Other Pacific Islander	3	1.6%
	Other	8	4.1%
	Primarily Heterosexual	176	91.2%
	Primarily Bisexual	1	0.5%
	Primarily Homosexual	16	8.3%

Table 2
Means, Standard Deviations and Bivariate Correlations of Target Measures

Variable	1	2	3	4	5	6	7	8	9	10	11	12	M	SD
1. CMNI - 46	-												1.43	0.35
2. ATSPPH-SF	-0.363*	-											1.91	0.50
3. HBI - 20	-0.338**	0.203**	-										5.22	0.75
4. CMNI - Win	0.605**	-0.123	-0.041	-									1.65	0.59
5. CMNI - EC	0.575**	-0.426**	0.236**	0.139	-								1.40	0.60
6. CMNI - Risk	0.513**	-0.111	-0.120	0.365**	0.063	-							1.47	0.58
7. CMNI - Viol	0.647**	-0.279**	0.296**	0.375**	0.230**	0.371**	-						1.84	0.66
8. CMNI - Power	0.590**	-0.287**	0.303**	0.205**	0.337**	0.149*	.323**	-					0.95	0.60
9. CMNI - Play	0.372**	0.116	-0.308**	0.105	0.217**	0.137	.161*	.320**	-				1.51	0.77
10. CMNI - SR	0.616**	-0.301**	0.301**	0.223**	0.482**	-0.160**	.196**	.319**	.208**	-			1.21	0.62
11. CMNI - Work	0.162**	0.060	0.164*	0.136	0.003	0.111	-0.123	-0.084	-0.167*	0.048	-		1.21	0.66
12. CMNI - Hetero	0.657**	-0.300**	-0.170*	0.293**	0.254**	0.187**	0.373**	.377**	-0.041	0.345**	0.054	-	1.37	0.79

Note. Scores for the CMNI-46 range from 1-4, with higher scores indicating greater conformity to traditional masculine norms. Scores for the ATSPPH range from 1-4, with higher scores representing more positive attitudes towards professional psychological help-seeking. Score for the HBI-20 range from 1-7, with higher scores indicating greater health promotion behavior.

* $p < .05$, two-tailed. ** $p < .01$, two-tailed

Table 3

Regression Analysis of HBI-20 Scores Using Total Scale Scores of the CMNI-46 and ATSPPH

Variable	B	SEB	Beta	<i>T</i>	<i>p</i>
ATSPPH	0.136	0.108	0.092	1.261	0.209
CMNI-46	-0.640	0.154	-0.304	-4.168	0.000

Figure 1. Below is a scatterplot of the mean scores for APED users on the Conformity to Masculine Norms Inventory (CMNI-46) and the mean scores of the Attitudes Towards Seeking Professional Psychological Help – Short Form (ATSPPH-SF).

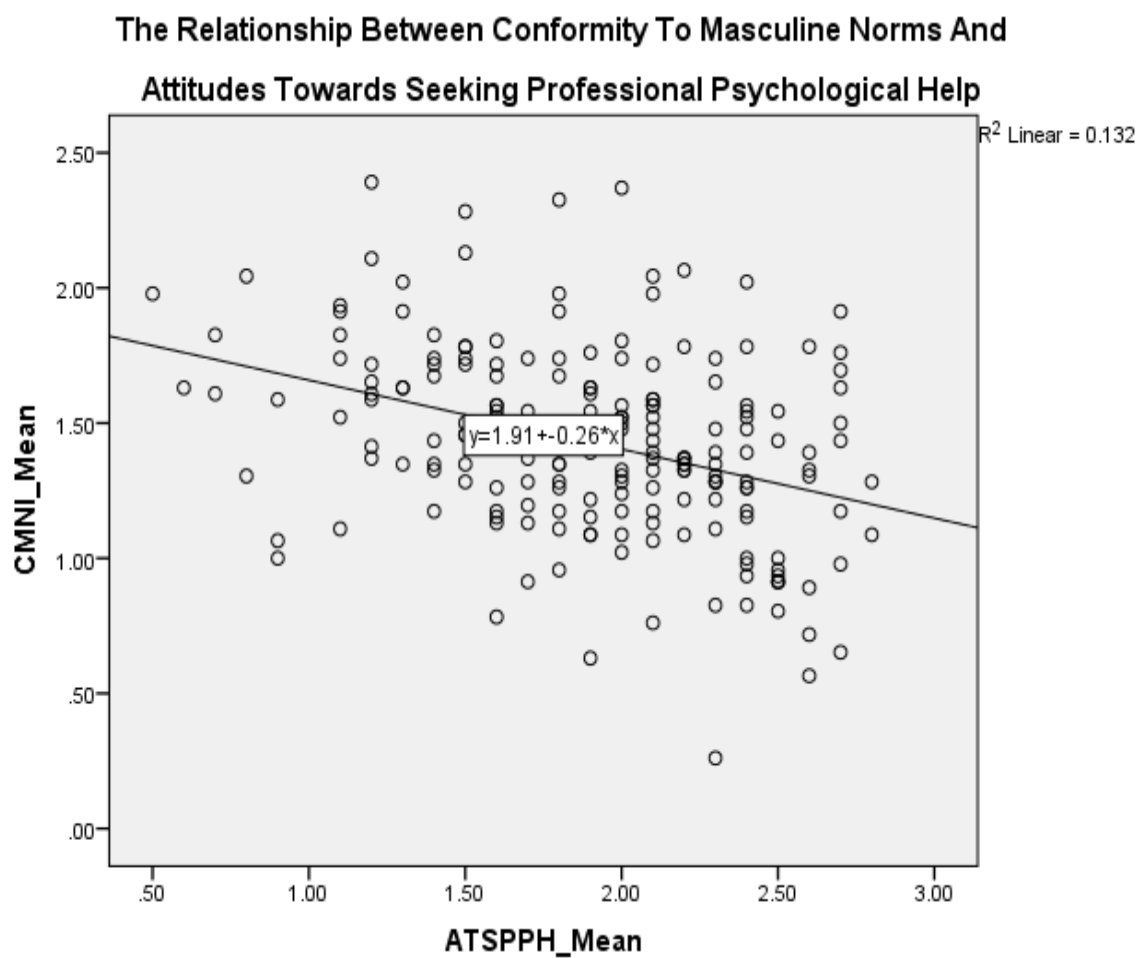


Figure 2. Below is a scatterplot of the mean scores for APED users on the Conformity to Masculine Norms Inventory (CMNI-46) and the mean scores of the Health Behavior Inventory (HBI-20).

