

Understanding the Influence of Proximal Networks on High School Athletes' Intentions to Use Androgenic Anabolic Steroids

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Understanding what influences adolescent athletes is important for managers designing anti-doping initiatives. It is commonly assumed that elite athletes who dope influence adolescent athletes to similarly dope. Using the theory of normative social behavior, the effect of norms on adolescent athletes' intentions to use steroids was examined. The social distance between respondents and the source of normative information was systematically varied to include four separate levels (friends, teammates, college athletes, professional athletes). Data were collected from 404 male adolescent athletes. Participants indicated their intentions to use steroids and their perceptions of descriptive and injunctive norms of referent others. Descriptive and injunctive norms were predictive of intentions to use steroids with the magnitude of explained variance greater with more proximal referents. Adolescent athletes' intentions to use steroids are influenced by social norms. Moreover, the social distance of referents is consequential. Interventions strategies should incorporate teammates and friends, rather than professional athletes.

Over 7.5 million adolescents participate in high school sport and this number has steadily grown over the last two decades (National Federation of State High Schools Association, 2012). With so many adolescents playing sports it is important that these athletes are engaged in sport in a healthy and safe manner. One ongoing concern is the extent to which these athletes are exposed to, and use illegal performance enhancing substances. At all levels of sport, from the professional level to the high school level, sport managers are faced with the challenge of managing sport so that the integrity of the game is maintained and participants' health protected. However, the sheer number of athletes participating at the high school level makes managing this task difficult. Sport managers are therefore challenged to

devise ways in which to address the issue of doping abuse in sport. Rather than be just a mere theoretical exercise, sport managers have to make decisions and implement policies relevant to tackling these issues. For instance, in response to Senate Bill 8 being passed in Texas, the University Interscholastic League (the governing body that organizes high school sport in Texas) was tasked with managing, what amounted to, the largest performance enhancing drug-testing program in the world (Woolf & Swain, 2013). The sport managers at this organization therefore had to implement this anti-doping legislation as well as manage high school sport competitions in the state of Texas. Thus those who oversee sport are increasingly faced with the reality that they will have to address the issue of doping abuse.

While drug testing may be one way in which to manage doping in sport, it is by no means the only way. As with other consumer behavior issues, it is important to understand what may influence an individual to behave in one-way and not another. Within this present context, this means examining what, or who, may influence a high school student to use, or not use, an illegal performance enhancing substance. Understanding pathways of

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influence may enable sport managers to devise targeted strategies for addressing this issue. One source of influence that is often associated with young athletes is role models, such as elite athletes.

One only has to make a cursory scan of the sport news media to quickly find a story connecting elite athletes with performance enhancing substance use. The Lance Armstrong affair, the Steroids Era in major league baseball and more recently, the Biogenesis controversy in Miami all serve to remind sport managers of the ubiquity of doping in sport. These scandals ignite debate over performance enhancement in sport and the ways in which this issue should be managed. This has become a particularly contentious issue at the high school sport level (Woolf & Swain, 2013). The assumption that is made is that high profile cases of doping serve to provide negative role models for adolescent athletes and subsequently motivate use in this population. For example, following the BALCO scandal, President George W. Bush specifically addressed anabolic androgenic steroids use (hereafter referred to as 'steroids') in sports as part of his 2004 State of the Union speech. In this speech President Bush called upon professional athletes to be positive role models. Organizations such as the U.S Olympic Committee and the United Nations have similarly taken a stance that professional athletes are role models in the fight against steroids and drug abuse (Petersen, 2010; Shaw, Whitehead, & Giles, 2010). Similarly, academic and medical communities have recognized that athletes are influential role models for youth (Martin, Baron, & Gold, 2007).

The notion that professional athletes influence adolescents' drug use, however, is axiomatic rather than empirically based. Research on the influence of athletes on others' drug use has tended to focus on adult populations and not adolescents. For example, famous athletes have been reported to influence adults' intentions to try androstenedione, a sport supplement (Brown, Basil, & Bocarnea, 2003). What is unknown, however, and the focus of this paper, is the extent to which adolescents' steroids use is influenced by social norms—perceptions about the prevalence of use—also known as descriptive norms—and pressures that adolescents perceive to conform—known as injunctive norms (Cialdini, Reno, & Kallgren, 1990). Understanding the influence of social norms may be important as these sources may influence moral decision making and moral stances toward steroid use (i.e., the degree to which adolescent athletes think using steroids is wrong) has been associated with intentions to dope in the future (Skinner, Moston, & Engelberg, 2012). In addition, in a professional, nonpeer reviewed report, Rees, Zarco, and Lewis (2007) provide evidence those adolescents who self-identity as part of a clique (e.g., 'preppie', 'regular', 'jock') have similar intentions to use steroids as other self-identified group members. It is therefore unclear to what extent referent others, whether they are aspirational others (e.g., professional athletes) or similar others (e.g., teammates), influence adolescents' to dope and whether one source is more influential than another.

This study systematically examines the influence of social norms at different levels of social proximity to the athlete, i.e., we examine whether individuals close to the athlete, such as teammate are more influential than individuals who are socially distal to the athlete, such as professional athletes. Understanding sources of influence and the different types of influence on young athletes is important for sport managers that are responsible for the oversight of high school sports. While the focus on this study is on steroids, understanding sources of influence is important for sport managers in general, as it may better enable them to directly and effectively influence consumers and stakeholders.

Steroids are specifically targeted in this study because adolescent athletes are more likely to use unsophisticated versions of steroids rather than more sophisticated doping substances (Woolf & Swain, 2013). The previous statement is based on the opinion of a panel of experts on doping that included advocates for the legalization of doping substances. Moreover, the focus was limited to steroids because steroid abuse has historically been linked to scandals in high school sports (e.g., Jones & Jacobson, 2005) rather other doping strategies (e.g., blood doping, use of erythropoietin, growth hormone and other growth hormone releasing peptides). Furthermore, these other forms of doping often require technical competency to administer, and a quick search on the Internet reveals that these substances are substantially more expensive than steroids. The cost and sophistication of alternative doping strategies makes it less likely that adolescent athletes engage in these practices.

Current Anti-doping Strategies

Understanding the ways in which social norms influence adolescent athletes is important for sport managers and policy makers because it enables current strategies to combat doping in sport to be enhanced and for alternative strategies to be created. Current strategies to combat doping at the elite level tend to be limited to legal enforcement and educational efforts (O'Reilly & Madill, 2007). The high school contexts mirrors this approach with educational efforts a central component of anti-doping initiatives. However, educational programs are problematic in that adolescent athletes are typically not interested in these programs (Naylor, Gardner, & Zaichkowsky, 2001), staff are not confident in their ability to delivery these programs (Mottram, Chester, & Gibson, 2008), and the effectiveness of these programs is questionable (Woolf & Swain, 2013). Critics of educational programs state that if these programs were in fact effective and as cost efficient as proponents state, that these programs would be commonly practiced in schools and the issue of drugs abuse solved. While education is considered necessary, it has not been considered sufficient to deter doping abuse (Woolf & Swain, 2013). Furthermore, the occurrence of high profile cases of elite athletes use of steroids has prompted multiple states in America to expand the war

on drugs by implementing drug-testing programs at the high school level.

However, drug-testing programs are also heavily criticized for their cost and questionable success. For instance, the drug-testing program in Texas mentioned earlier had an initial budget of \$6 million and produced only 0.5% positive or questionable results (questionable refers to situations where the athlete refused or did not fully participate in the program) over a 3-year period. As discussed earlier, the Texas program was so large that the number of athletes tested actually dwarfed the program run at the Olympics (Woolf & Swain, 2013). These programs have been controversial because they are costly and their effectiveness in terms of detection and deterrence is difficult to determine (Woolf & Swain, 2013). For instance, despite the size of the Texas program, only a small fraction of the total number of high school athletes in Texas was actually tested. In addition to educational efforts and drug-testing, there have been calls for social marketing campaigns to be included as part of an overall portfolio of tactics to manage doping in sport (O'Reilly & Madill, 2007). There has been a nationwide campaign directed toward youth athletes and steroid use (the 'Don't be and asterisk' campaign). However this campaign, while well produced, was designed using questionable emotional triggers (i.e., shame, which has the potential to be counterproductive to behavioral change (Agrwal & Duhachek, 2010) and was accompanied by social media websites that lay dormant for months on end (Woolf, 2010). For antidoping interventions to be successful, whether it is an educational or social marketing campaign, it is important to understand the target of these interventions. In this study, the target market is explored by investigating the influence social norms have on adolescent athletes' intentions to use steroids.

Consequences of Steroid Use

Steroid use among adolescent is of concern because of the myriad negative health consequences. Its use has negative physiological effects, including cardiac hypertrophy, myocardial infraction, hepatic disease, gynecomastia, increased levels of low density lipoproteins, and decreased levels of high density lipoproteins (Casavant, Blake, Griffith, Yates, & Copley, 2007; Thiblin & Petersson, 2004; Trenton & Currier, 2006). Psychological complications include increased aggression, hypomania, psychosis, dependency, depression, and suicide (Casavant et al., 2007; Thiblin & Petersson, 2004; Trenton & Currier, 2006). Use of steroids among adolescent males has consistently been reported between 2% and 5%, and in some studies, lifetime prevalence rates exceed 10% (Eaton et al., 2010; Johnston, O'Malley, Bachman, & Schulenberg, 2011; Miller et al., 2005; Yesalis, Barsukiewicz, Kopstein, & Bahrke, 1997). These rates are likely underestimated, particularly in certain power sports, and it is predicted that steroid use by adolescent athletes will increase in the future (Woolf & Swain, 2013). These rates

are similar to lifetime prevalence use of cocaine, heroin, and approximate rates of frequent cigarette smoking by adolescents (Johnston et al., 2011).

Adolescents increasingly downplay the harmfulness of steroids, many of them believing that it can be taken without much consequence (Johnston et al., 2011; Laure, Lacerf, Friser, & Binsinger, 2004). Adolescents who play sports are more likely to be offered steroids (Wichstrøm & Pedersen, 2001), and participation in sports is associated with higher levels of steroids use (Lorang, Callahan, Cummins, Achar, & Brown, 2011; Terry-McElrath, O'Malley, & Johnston, 2011). Moreover, adolescent athletes believe that incidents of steroids use are increasing (Laure et al., 2004), and that its use is necessary to obtain a competitive advantage in sports performance (Becker & Scheufele, 2008). Early use of steroids is also problematic because young athletes attribute their sporting success to their use of steroids (Laure & Binsinger, 2007) and these types of attributions may be enduring (Haan, Aerts, & Cooper, 1985). In sum, these issues demonstrate that steroid use by adolescent athletes should be of significant concern for sport managers and policy makers of youth sport.

Social Norms

Even though the scholarship on normative influences has been growing substantially in recent years (Mollen, Rimal, & Lapinski, 2010), it has not been used to study adolescents' attitudes and behaviors toward steroids use. Normative influences may be especially important among athletes because the athletic community is an influential site where friendships and social bonds develop (Schaefer, Simpkins, Vest, & Price, 2011), and this creates an appreciable level of social dependency (Martens, Dams-O'Connor, & Beck, 2006). It also heightens the potential effect of social norms for two reasons. First, when one's social interactions are limited to a small circle of friends, information about the prevalence of the behavior (i.e., descriptive norm) is likely to be limited to the people that one observes among this small group. Second, what one perceives to be acceptable or unacceptable (injunctive norm) is confined to what one believes this small group believes; this group, after all, is the one whose approval would matter the most.

There have been calls for more research on the effect of perceived norms on steroids use (e.g., Donovan, Egger, Kapernick, & Mendoza, 2002; Petróczi & Aidman, 2008, Stewart & Smith 2008), but this has tended to be directed toward use by elite athletes. This is perhaps unsurprising because, in conversations with elite athletes, researchers have reported a general belief that peer use influences own use (Kirby, Moran, & Guerin, 2011; Stewart & Smith, 2010). However, there has been little effort to examine the impact of peers or aspirational others on adolescent athletes' intentions toward steroids use.

Even though the impact of perceived norms has not received much scholarly attention in the domain of

steroids use, there is a substantial body of work documenting normative influences in the use of another substance among adolescents—alcohol. Specifically, research has highlighted the misperception college students have of drinking norms among their peers (Perkins & Berkowitz, 1986), and many social marketing initiatives have sought to determine the impact of restructuring students' normative beliefs to affect their drinking behavior (DeJong et al., 2006, 2009; Wechsler et al., 2003). Although there are reports that correcting misperceptions of perceived norms of alcohol consumption among student athletes does reduce alcohol consumption (Perkins & Craig, 2006), findings from rigorous research are equivocal (Wechsler et al., 2003). A partial explanation for inconsistent findings in the literature may be the way in which perceived norms have been conceptualized in previous studies (Real & Rimal, 2007).

“Perceived norms” consist of descriptive norms and injunction norms (Cialdini et al., 1990). Descriptive norms are the perceived prevalence of a behavior, whereas “injunctive norms” represent perceptions of what influential others expect one to do, such that non-compliance is associated with social sanctions (Bendor & Swistak, 2001). Previous research on perceived norms has not always taken this distinction into account. The theory of normative social behavior (TNSB), which takes this distinction into account, states that the relationship between descriptive norms and behaviors is moderated by a number of factors, including injunctive norms, outcome expectations, and group identity (Rimal & Real, 2005). “Outcome expectation” refers to the extent to which one believes benefits will accrue from one's actions. This construct has been operationalized as benefits that one (or one's group) receives from one's actions (Rimal, 2008). “Group identity” refers to the extent one feels affinity and attraction to the referent group (Lapinski & Rimal, 2005).

Application of the TNSB in the domain of adolescent steroids use implies that adolescents are more likely to use the substance if they perceive that its use is high among their social referents (high descriptive norms). According to the theory, this influence will be further strengthened if adolescents also believe that their important referents approve of their steroids use (high injunctive norms) and they believe they will benefit from use (outcome expectation).

Injunctive norms toward the use of steroids are typically negative (most believe that using it is wrong), particularly among athletes' referent others, such as coaches. In fact, MacKinnon et al. (2001) reported that among high school football players who participated in the Adolescents Training and Learning to Avoid Steroids (ATLAS) program, perception of the coach's intolerance of steroids use was associated with reduction in intentions to use steroids. It should be noted that the ATLAS program did not specifically target normative beliefs, but it provided evidence that these beliefs can impact intentions to use steroids. Similarly, Dodge and Jaccard (2008) reported that perceived norms predicted intentions to abstain from steroids, but their conceptualization of

norms (termed “subjective norms”) represents injunctive norms instead of descriptive norms. Lucidi et al. (2008) also reported that intentions to dope increased when “meaningful others” approved of their use. In addition, Lazarus and colleagues (2010) have reported that among adult elite Greek athletes, normative beliefs do predict doping intentions. However, in this study descriptive norms were generalized to all athletes and injunctive norms were unrelated to the source of descriptive norms. Finally, Denham (2009) has demonstrated that perceptions of the risks associated with steroids use are low when adolescents estimate peer use to be high and when steroids are readily available.

This study expands on the TNSB in two important ways. First, the theory is applied in a domain, steroid use among athletes, characterized by strong social ties, where individuals interact with each other in a tightly-knit community that can also be insular from others. This is an ideal setting for the use of a theory about norms, because it provides a match between the underlying attributes of both the behavior and the theory, as suggested by the behavioral attribute approach (Rimal, Lapinski, Turner, & Smith, 2011). Second, greater specificity is provided to the idea of social distance (or, social proximity) in delineating the influence that different types of sources can exert on individuals. Normative influence varies according to the type of source providing the information about the behavior (Campo et al., 2003; Neighbors et al., 2008). In this study social distance between the source of normative information and the target was systematically varied to model the strength of the influence. The hypotheses tested are:

H1: There will be a main-effect of descriptive norms, injunctive norms, and outcome expectations on intentions to use steroids.

H2: There will be an interaction effect between descriptive norms and (a) injunctive norms, and (b) outcome expectations on intention to use steroids.

H3: As social proximity between the target and the referents increases, the explanatory power of the norms-based model will increase.

Method

Data for this study came from athletes recruited from eight medium to large sized high schools from Illinois and Iowa (M enrollment = 1,545; SD = 803). Schools of this size were targeted as larger schools have more students to select from when choosing players for their team, thereby making it a more competitive venture to play for one's school. Permission to collect data onsite was obtained from the principal of each school. A research associate met with the head coach of each sports team and the athletes and made an oral presentation that highlighted the purpose of the research project along with the benefits and risks associated with participation. Athletes were informed that they would receive complete

confidentiality, and because data was collected online, complete anonymity. Letters of information and parental consent forms were then provided to all athletes, who were asked to return these forms to their coaches. The research team returned approximately one week later to collect these forms and administer the survey. The institutional review board of the primary author's home institution at the time, approved the protocol.

Participants were 404 high school male athletes that played on one of their school's football, baseball, or basketball teams, whose ages ranged from 14–19 years ($M = 16.06$, $SD = 1.23$). The sample included 78.9% Caucasians, 10.2% African Americans, 4.2% Hispanic, 1.2% Asian American, and 4.5% classified as Other. Parental consent was obtained for individuals under the age of 18, who also completed an informed assent form. The three sports were chosen because they rank highly as popular sports among adolescents to play (National Federation of State High Schools Association, 2012), involve power, strength, and speed, and are high profile sports where college scholarship are competitively sought, and lucrative opportunities to play professionally exist. Baseball and football, in particular have had high profile doping scandals and basketball has recently come under scrutiny with several positive tests, and accusations of widespread abuse made by current star player, Derrick Rose.

Participants completed an online survey administered using Qualtrics. The use of an online survey enabled questions to be worded to match the participants' sport, thus all basketball players answered questions that referred to basketball and all football players answered questions that referred to football, and so forth.

A pilot test of the survey to account for reading comprehension was conducted with four middle school athletes (age 12–13). The pilot test also included the assessment and creation of a definition for steroids. The definition provided was, "Anabolic androgenic steroids are illegal substances that are taken to help improve performance in sport or physical activity." This definition was included at the introduction of the survey and was included at the top of each survey page. The start of the survey included an introduction that welcomed the participants to the survey. Participants were provided information on the purpose of the study, the risks, discomforts, and benefits of the study, a statement that guaranteed their confidentiality, their rights as participants, and contact information of the principal investigator and the lead author's institutional review board should they have any questions. Participants were then asked to indicate whether they wished to participate in the study. If the participant elected to be in the study the online survey then proceeded to the first question. If the participant elected not to be in the study, the online survey went to a page that thanked them for their time and the survey then closed. Participants completed the survey in their school's computer laboratory, which was reserved for the purposes of this study. Proctors were present and standard computer laboratory rules enforced (e.g., no

talking or interacting with peers). Participants received remuneration of \$10 for completing the survey.

Measures

Given prior research showing that source of normative information is critical in its influence on behaviors (Neighbors et al., 2008), the social distance between respondents and their referents (as the source of normative information) was varied. The most distal sources were professional athletes, followed by college athletes, adolescents' own team members, and (conceptualized as the most proximal) adolescents' own friends. For example, the most distal source was operationalized as "professional football players" and the most proximal source as "my friends."

Intentions Actual behavior was not used as the dependent variable because prevalence of steroid use was low (about one percent). Behavior measures are also difficult to acquire because steroid use is a taboo topic and athletes are reluctant to acknowledge use, even when provided with anonymity and confidentiality (Woolf & Swain, 2013). Instead, intentions to use steroids was used as the dependent variable. Prior research suggests that intentions are adequate predictors of behavior given their consistency in correlation (Webb & Sheeran, 2006). Participants expressed their level of agreement with three statements ("I intend to/will/plan to use anabolic steroids in the near future."). Responses, each measured on a 7-point scale, were averaged into an index (Cronbach's $\alpha = .97$).

Descriptive Norms Descriptive norms were operationalized as beliefs about the prevalence of the behavior among others. The "others"—the sources of descriptive norms—were further divided into four groups that varied in their social proximity from participants. Descriptive norms among the most distal group were calculated as the average of perceived prevalence of steroids use among professional athletes ($\alpha = .89$), assessed through three items, each on a 7-point scale. Similarly, descriptive norms among the next closer group, college athletes, were assessed with three analogous items ($\alpha = .90$). The next group comprised "my own team members," for whom descriptive norms were assessed through three items ($\alpha = .94$). Finally, the most proximal group comprised "my own friends," whose descriptive norms were also assessed through three items ($\alpha = .95$).

Injunctive Norms Injunctive norms elicited how much approval participants believed they would gain by using steroids (e.g., "My teammates on my school's baseball team would be supportive if I used anabolic steroids"). As was the case with descriptive norms, injunctive norms were assessed along the same four groups, separated by social proximity. Reliability scores were $\alpha = .94$, $.95$, $.95$, and $.96$, respectively.

Outcome Expectations Three variables assessed participants' perceptions about personal benefits (e.g., "I will be a more successful athlete if I use anabolic

steroids”) and three others assessed their perceptions about social benefits (e.g., “By using anabolic steroids I can help my team win”). Responses were subjected to a principal component factor analysis with varimax rotation, which revealed a unidimensional structure (single factor explained variance = 83.5%). Responses were then averaged into an index ($\alpha = .96$) of outcome expectations.

Control Variables The influence of normative variables on intention was tested by controlling for age, ethnicity, and the sport played by the respondent.

Exploratory descriptive analysis of the measures and subsequent bivariate and multivariate linear regression models were carried out using STATA 11. Regression analyses were performed with respect to level of normative influence to study the effect of proximity of descriptive and injunctive norms on intent to use steroids among high school athletes.

Results

Preliminary Analyses

The study sample ($N = 404$) of athletes comprised football ($n = 222$), baseball ($n = 114$), and basketball ($n = 69$) players, and they were predominantly of Caucasian ethnicity (Table 1). Intention to use steroids was low ($M = 1.23$, $SD = 0.80$). Descriptive and injunctive norms differed substantially by social distance; as proximity increased (other professional athletes being the most distal and one’s own friend being the most proximal), descriptive norms pertaining to the particular source decreased in magnitude. Global F -tests and pairwise comparisons between the norms levels showed that they were different from each other $F(3, 400) = 106.05$, $p < .001$.

Table 1 shows the descriptive statistics and the bivariate correlations among the study variables. Intention to use steroids was not associated with age, ethnicity, or the type of sports that the participant played. The relationship between descriptive norms and intentions varied according to whether the normative information pertained to others who were socially most distal (e.g., professional athletes, $r = .18$, $p < .001$) or most proximal (close friends, $r = .31$, $p < .001$). Similarly, the relationship between injunctive norms and intentions also varied according to the proximity of the source of normative information: The most distal were professional athletes ($r = .16$, $p < .01$) and the most proximal were close friends ($r = .31$, $p < .001$). Outcome expectations were also positively related to intentions to use steroids ($r = .17$, $p < .001$).

Hypotheses Tests

Most Distal Source—Professional Athletes Table 2 shows results of regression equations that predicted intention to use steroids when norms pertained to professional athletes—the socially most distal source. Results showed that age, ethnicity, and sport explained about 1% of the variance in intention to use steroids

(Model 1). When descriptive norms, injunctive norms, and outcome expectations were added into the equation (Model 2), the explained variance was 7% ($p < .001$). There was a main-effect for descriptive norms ($\beta = .11$, $p < .05$) and a main-effect for outcome expectations ($\beta = .14$, $p < .01$), but no main-effect for injunctive norms. Neither the descriptive norms \times injunctive norms nor the descriptive norms \times outcome expectations interaction term was significantly associated with intention.

Distal Source—College Athletes Table 3 shows results from the regression equations pertaining to college athletes as sources of influence. As was the case in Table 2, the control variables were not associated with intention, and the two significant main-effects were those for descriptive norms ($\beta = .12$, $p < .05$) and outcome expectations ($\beta = .14$, $p < .01$); injunctive norms were not associated with intentions. The interaction between descriptive norms and injunctive norms was significant (unstandardized beta = $.70$, $p < .001$) such that intentions were greatest when both types of norms were high. The interaction between descriptive norms and outcome expectations was not significant.

Proximal Source—Own Team Members As shown in Table 4, there was a main-effect for descriptive norms ($\beta = .20$, $p < .001$), a main-effect for injunctive norms ($\beta = .16$, $p < .01$), and a main-effect for outcome expectations ($\beta = .11$, $p < .05$). The model explained 12% of the variance. Neither of the two interaction effects was significant.

Most Proximal Source—Close Friends For the most proximal source, as shown in table 5, there was a significant main-effect for descriptive norms ($\beta = .24$, $p < .001$), injunctive norms ($\beta = .17$, $p < .05$), and outcome expectations ($\beta = .10$, $p < .05$). None of the interactions were significant.

Across the various tests, descriptive norms were consistently associated with intentions, injunctive norms were associated with intentions for the two proximal, but not the two distal, sources, and outcome expectations were consistently associated with intentions. Furthermore, the magnitude of the explained variance was higher at higher levels of proximity of the source of normative influence. Hence, partial support was found for H1 and H2, and full support for H3.

Discussion

In what is a seemingly routine revelation, famous athletes are found guilty or admit to the use of doping substances. The purity of college athletics has also come into question, with allegations of rampant steroids abuse at major Division One institutions in the United States (Eggers, 2009). These events are often followed by discourse on the potential trickle-down effect on younger athletes. The public perception is that steroids abuse is a significant growing problem in sports (Becker & Scheufele, 2008). Given these broader trends, managers and policy makers

Table 1 Descriptive Statistics and Zero-order Pearson Correlations (N = 404) among Intention to Use Steroids and Other Predictors

Variable	Mean (SD) or %	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
(1) Intention	1.23 (0.78)	1											
(2) Age	16.07 (1.23)	.06	1										
(3) White	79.9%	-.08	-.01	1									
(4) Sport ^a		-.06	-.09	0.01	1								
Football	54.4%												
Baseball	27.9%												
Basketball	17.0%												
(5) Professional DN	3.29 (1.38)	.18***	.09	.09	-.09	1							
(6) College DN	2.70 (1.23)	.17***	.10*	-.01	-.13**	.66***	1						
(7) Team DN	1.31 (0.73)	.25***	.04	-.07	-.12*	.18***	.29***	1					
(8) Friends DN	1.21 (0.57)	.31***	.06	-.09	-.00	.20***	.23***	.58***	1				
(9) Professional IN	2.34 (1.32)	.16**	.10*	-.07	-.09	.39***	.35***	.16**	.20***	1			
(10) College IN	2.29 (1.30)	.17***	.08	-.06	-.09	.33***	.41***	.20***	.25***	0.81***	1		
(11) Team IN	1.73 (1.14)	.28***	.09	-.04	-.09	.19***	.15**	.29***	.33***	0.44***	.49***	1	
(12) Friends IN	1.66 (1.10)	.31***	.11*	-.06	.03	.10	.06	.17***	.33***	.36***	.40***	.75***	1
(13) Outcome Expectations	4.13 (1.70)	.17***	.15**	.16**	-.08	.25***	.18*	.09	.10*	.22***	.22***	.30***	.27***

Notes: * $p < .05$; ** $p < .01$; *** $p < .001$. Reference group for sport is football. Some correlations are based on smaller sample size because of missing values. DN = descriptive norms; IN = injunctive norms.

Table 2: Predictors of Intentions to Use Anabolic Steroids from Multivariate Regressions (N = 404): Norms Pertaining to Professional Athletes

	Model 1	Model 2	Model 3	Model 4
Age	.06	.02	.02	.03
White ethnicity	-.08	-.11*	-.11*	-.10*
Sport (baseball)	.04	.04	.04	.04
Sport (basketball)	-.08	-.05	-.04	-.06
Descriptive norms (DN)		.11*	.03	-.04
Injunctive norms (IN)		.07	-.06	.06
Outcome expectations (OE)		.14**	.14**	.00
DN*IN			.19	
DN*OE				.24
R-squared	.01	.07	.07	.07

Note: Cell entries are standardized betas from regression equations. Model 1 includes control variables only. Model 2 includes all predictors (controls, norms and outcomes expectations). Model 3 assesses interaction of descriptive and injunctive norms. Model 4 assesses interaction of outcomes expectations and descriptive norms. Referents for dummy variables: ethnicity = non-White, sport = football. * $p < .05$; ** $p < .01$; *** $p < .001$

Table 3: Predictors of Intentions to Use Anabolic Steroids from Multivariate Regressions (N = 404): Norms Pertaining to College Athletes

	Model 1	Model 2	Model 3	Model 4
Age	.06	.02	.03	.03
White ethnicity	-.08	-.10*	-.08	-.10
Sport (baseball)	.04	.07	.07	.07
Sport (basketball)	-.08	-.05	-.05	-.06
Descriptive norm (DN)		.12*	-.22*	-.07
Injunctive norm (IN)		.08	-.38**	.08
Outcome expectations (OE)		.14**	.15**	-.01
DN*IN			.70***	
DN*OE				.28
R-squared	.01	.07	.11	.08

Note: Cell entries are standardized betas from regression equations. Model 1 includes control variables only. Model 2 includes all predictors (controls, norms and outcome expectations). Model 3 assesses interaction of descriptive and injunctive norms. Model 4 assesses interaction of outcome expectations and descriptive norms. Referents for dummy variables: ethnicity = non-White, sport = football. * $p < .05$; ** $p < .01$; *** $p < .001$

in sport have compelling reasons to be concerned that youth may internalize the wrong message by concluding that using steroids pays.

In this study high school athletes indicated relatively strong perceptions about the benefits of steroids use. On a 7-point scale, the average rating for outcome expectation was 4.13 ($SD = 1.70$), and this variable was consistently associated with intentions to use steroids, even after controlling for other predictors. This is unsurprising in that steroids are widely acknowledged by the medical community and society to improve performance (Sjöqvist, Garle, & Rane, 2008). Moreover, the media often use the word “steroids” to communicate that a product or context

is somehow enhanced or superior. The ubiquitous nature of this use of the term steroids may influence youth’s perception of benefits and presence of steroids. The concern for sport managers and policy makers is that steroids use becomes perceived as not only beneficial, but normative.

Coverage in the media of steroids use also likely has an impact on subsequent use by athletes, and the data from this study seem to suggest that the heightened descriptive norms may constitute an important underlying mechanism to explain this process. In this sample of high school athletes, descriptive norms were consistently associated with intentions to use steroids, even though actual reported use was rather low (approximately one

Table 4 Predictors of Intentions to Use Anabolic Steroids from Multivariate Regressions (N = 404): Norms Pertaining to One's Own Team Members

	Model 1	Model 2	Model 3	Model 4
Age	.06	.03	.03	.03
White ethnicity	-.08	-.08	-.08 [#]	-.08
Sport (baseball)	.04	.08	.08	.08
Sport (basketball)	-.08	-.03	-.04	-.04
Descriptive norms (DN)		.20***	.13	.22
Injunctive norms (IN)		.16**	.09	.16**
Outcome expectations (OE)		.11*	.12*	.13
DN*IN			.11	
DN*OE				-.03
R-squared	.01	.12	.13	.12

Note: Cell entries are standardized betas from regression equations. Model 1 includes control variables only. Model 2 includes all predictors (controls, norms and outcome expectations). Model 3 assesses interaction of descriptive and injunctive norms. Model 4 assesses interaction of outcomes expectations and descriptive norms. Referents for dummy variables: ethnicity = non-White, sport = football. * $p < .05$; ** $p < .01$; *** $p < .001$

Table 5 Predictors of Intentions to Use Anabolic Steroids from Multivariate Regressions (N = 404): Norms Pertaining to One's Close Friends

	Model 1	Model 2	Model 3	Model 4
Age	.06	.01	.01	.01
Ethnicity (white)	-.08	-.07	-.07	-.69
Sport (baseball)	.04	.04	.04	.03
Sport (basketball)	-.08	-.08	-.08	-.08
Descriptive norms (DN)		.24***	.13	.18
Injunctive norms (IN)		.17***	.07	.17**
Outcome expectations (OE)		.10*	.11*	.06
DN*IN			.17	
DN*OE				.08
R-squared	.01	.15	.16	.15

Note: Cell entries are standardized betas from regression equations. Model 1 includes control variables only. Model 2 includes all predictors (controls, norms and outcomes expectations). Model 3 assesses interaction of descriptive and injunctive norms. Model 4 assesses interaction of outcome expectations and descriptive norms. Referents for dummy variables: ethnicity = non-White, sport = football. * $p < .05$; ** $p < .01$; *** $p < .001$

percent). Respondents reported significantly higher descriptive norms of steroids use among other athletes who were perceived to be socially distal, as compared with those who were socially proximal. Professional athletes, for example, were thought to use steroids much more frequently than respondents' own teammates or their close friends.

Findings from this paper also showed that the association between descriptive norms and behavioral intentions should be studied in the context of social proximity. On the one hand, distal others were thought to use steroids more often and to approve more strongly of respondents' own use; on the other hand, the predictive ability of normative beliefs pertaining to these distal others was

weaker than those who were socially more proximal. Neighbors et al. (2008) reported a similar finding in the context of college students' alcohol consumption. In their study, injunctive norms emanating from the distal group, operationalized as a "typical student," did not correlate with respondent's own alcohol use. This study therefore extends the current literature on the effect of normative influences on behavioral intentions by demonstrating that proximity matters and that the influence of norms on behavioral intentions varies according to the social proximity of the source of normative information.

The implications of this study are that anti-steroid interventions targeted toward youth should focus on deemphasizing the benefits of steroids use, while

highlighting the costs associated with this behavior along with the low prevalence of use among an individual's reference group. Another implication for anti-doping interventions pertains to the timing associated with educational efforts. Data from this study indicated not only that high school students already had fairly well developed (though perhaps erroneous) notions about the prevalence of the use of steroids among their friends, their teammates, other college athletes, and professional athletes, but these perceptions were themselves associated with their own intentions. Thus, interventions need to start earlier, before high school, when normative beliefs appear to have been fairly well entrenched. In contrast, interventions tend to start later, when adolescents may already be heavily involved in sport. For example, both the Adolescents Training and Learning to Avoid Steroids (ATLAS) program (Goldberg, et al., 2000) and the Athletes Targeting Health Exercise and Nutrition Alternatives (ATHENA) programs (Elliot, Goldberg, Moe, DeFrancesco, Durham, & Hix-Small, 2004) are targeted toward established high school athletes. Similarly the 100% ME program offered by UK Sport mainly focuses on elite youth and adult athletes (Mottram et al., 2008), while in Sweden, a 2 year intervention targeted toward adolescents generally, not just athletes, involved 16–17 year olds (Nilsson, Allebeck, Marklund, Baigi, & Fridlund, 2004).

The ATLAS, ATHENA, and 100% ME programs educate athletes on the negative aspects of doping abuse while providing alternative strategies (e.g., nutritional information, weight training instruction) for athletic success. A distinct feature of the Swedish program was that information was not provided on the effects of steroids unless requested. Instead, this intervention involved discussion groups on physical appearance and raising self-confidence and awareness of appearance ideals. The results from this study suggest that the educational components of steroids should be incorporated into an intervention targeted toward young athletes precisely because of the perceived benefits of steroid use. Furthermore, information on the prevalence of use should be included in these curriculums so that youth can develop accurate perceptions of abuse among their peers. And as mentioned, this is best done earlier, rather than later, when assumptions may have developed and even become entrenched. By comparison, efforts to target youth cigarette, tobacco, and alcohol use start at earlier ages. For example, PBS Kids *It's My Life* website (www.pbskids/itsmylife.org) provides information on these substances to the pre-high school child. Furthermore, nonprofit organizations, such as Tobacco Free Kids, have a mandate to prevent child (teenage and pre-teenage) smoking.

The efforts used to address cigarette, tobacco, and alcohol use are not restricted to in-school intervention strategies, and likewise, anti-steroid campaigns should adopt multiple approaches to address this issue. The Swedish intervention described previously was one such program that incorporated television and cinema advertisements as part of a holistic strategy. The use of public service announcements and in particular social media

initiatives (e.g., interactive websites, Facebook pages, and Twitter feeds) can transmit targeted information to athletes. Based on this study it would be advised that information include statistics on the low rates of steroid use among high school athletes to offset the perception that abuse is widespread.

An additional implication arises from the results of this study—namely ‘who’ should deliver these messages. Injunctive norms were predictive of behavioral intentions for the two groups conceptualized as being socially proximal (respondents’ own teammates and close friends), but injunctive norms for the two socially distal groups (college and professional athletes) were not predictive of intentions. This raises doubt of the utility of using role models, or aspirational others (such as professional or collegiate athletes), as spokesperson for anti-steroid initiatives. In other words, the approval of close others matters. Interventions should therefore focus on message delivery by similar others and by incorporating peer-to-peer activities where discussions and information sharing on the dangers and ethics of steroid abuse can be conducted.

Finally, the results from this study will be of interest to policy makers involved with high school athletics. An initial impetus for the Texas high school program described earlier—the largest steroid testing program the world has ever seen—was the perception that negative role models serve to influence athletes to similarly abuse. The findings from this study contest this assumption and instead indicate that youth athletes are more concerned by the behavior and approval of their peers.

Limitations

This study has several limitations. First, the athletes in this study participate in sports characterized by strength, speed and power—attributes that are enhanced by steroids use. Other sports are not as reliant upon these features and therefore caution should be taken when generalizing to other sports contexts. This is not to suggest that the TNSB-related findings observed in this study (about the influence of perceived benefits, descriptive norms, and injunctive norms) are limited in their generalizability. Rather, application of the TNSB in studying other sports should take into account important contextual factors surrounding the behavior in question, as is suggested by the attribute-centered approach (Rimal et al., 2011).

Second, participations were also all male, and female athletes may have different attitudes toward, and motives for, steroids use (Irving, Wall, Neumark-Sztainer, & Story, 2002). Although prior tests of the TNSB (Rimal, 2008; Rimal & Real, 2005) have shown that males and females do not differ in their susceptibility to normative influences, the extent to which findings from this study that emanate from the particulars of steroids as a substance (for example, its implications for physical strength, emulation of the behaviors of famous steroids-using athletes who are mostly male) also generalize to

other substances and contexts are not known. They do, however, provide important areas for future research to understand the applicability of the TNSB across various behaviors, populations, and contexts.

Finally, youth may not understand what steroids really are, and there have been criticisms of research that does not take this into account (Kanayama, Boynes, Hudson, Field, & Pope Jr., 2007). This study attempted to address this limitation by defining steroids to participants using language that was pilot tested for comprehension and accuracy.

Conclusion

This study contributes to the growing literature on normative influences in two important ways. First, it extends the purview of the theory of normative social behavior (TNSB; Rimal & Real, 2005) by applying it to study a behavior—steroids use—among a relatively young (high school aged) population; to the best of our knowledge, this is the first study to do so—and to find that normative beliefs about steroids use are already fairly well entrenched among high school students. Second, by systematically varying social proximity, the effects on the relationship between descriptive norms and behaviors was shown to be influenced by social distance.

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