

Digital Commons
@ LMU and LLS

Digital Commons@
Loyola Marymount University
and Loyola Law School

Psychology Faculty Works

Psychology

1-1-2009

Normative Misperceptions and Marijuana Use Among Male and Female College Athletes

Joseph W. LaBrie

Loyola Marymount University, jlabrie@lmu.edu

Joel R. Grossbard

University of Washington

Justin F. Hummer

Loyola Marymount University, jhummer@usc.edu

Repository Citation

LaBrie, Joseph W.; Grossbard, Joel R.; and Hummer, Justin F., "Normative Misperceptions and Marijuana Use Among Male and Female College Athletes" (2009). *Psychology Faculty Works*. 23.
http://digitalcommons.lmu.edu/psyc_fac/23

Recommended Citation

Labrie, J. W., Grossbard, J. R., & Hummer, J. F. (2009). Normative Misperceptions and Marijuana Use Among Male and Female College Athletes. *Journal of Applied Sport Psychology*, 21, 577–585. <http://doi.org/10.1080/10413200802582839>

This Article - post-print is brought to you for free and open access by the Psychology at Digital Commons @ Loyola Marymount University and Loyola Law School. It has been accepted for inclusion in Psychology Faculty Works by an authorized administrator of Digital Commons@Loyola Marymount University and Loyola Law School. For more information, please contact digitalcommons@lmu.edu.



Published in final edited form as:

J Appl Sport Psychol. 2009 ; 21: 577–585. doi:10.1080/10413200802582839.

Normative Misperceptions and Marijuana Use Among Male and Female College Athletes

Joseph W. Labrie,

Loyola Marymount University

Joel R. Grossbard, and

University of Washington, Seattle

Justin F. Hummer

Loyola Marymount University

Abstract

This research assessed the frequency of marijuana use and perceptions of gender-specific marijuana use among intercollegiate athletes from two National Collegiate Athletic Association (NCAA) Division 1 universities. Normative data were gathered in a live setting. Male athletes reported significantly greater marijuana use than female athletes and the overall sample reported higher prevalence of use than national averages for college athletes and non-athletes. Gender-specific perceptions among male and female athletes exceeded actual self-reported use, and perceived marijuana use among male athletes was strongly associated with personal use. The findings demonstrate the salience of group-specific marijuana norms and present implications for normative feedback interventions among college athletes.

Substance use among intercollegiate athletes generally reflects patterns exhibited by their non-athlete peers, despite the potential for negative consequences on one's athletic performance, team cohesion, and athletic eligibility (Green, Uryasz, Petr, & Bray, 2001). Although researchers have primarily focused on etiological factors associated with alcohol use among athletes (e.g., see Martens, Dams-O'Connor, & Kilmer, 2007 for a review), less research has focused on illicit drug use. Marijuana is the most commonly used illicit drug among college students, as up to 30% of undergraduate students report marijuana use in the past year, and between 16–22% report use in the past month (CORE Institute, 2001). Consistent with prevalence estimates among college students in general, results of a national study of intercollegiate athletes indicated 28.4% of athletes used marijuana in the past year, second only to alcohol use (80.5%) (Green et al., 2001). Further, athletes reporting marijuana use were more likely to engage in heavy episodic drinking than athletes who did not report marijuana use (Wechsler, Davenport, Dowdall, Grossman, & Zanakos, 1997). Research has shown that college students who use both alcohol and marijuana are at heightened risk for incurring alcohol-related problems (Shillington & Clapp, 2001; Simons,

Gaher, Correia, Hansen, & Christopher, 2005). Thus, a greater understanding of social factors associated with marijuana use among athletes might inform interventions targeted at reducing marijuana-related consequences, as well as marijuana use in relation to alcohol use.

Problematic marijuana use is associated with psychological and physical consequences (Simons & Carey, 2006). Even short-term use can have potentially debilitating and residual effects, particularly for student-athletes. These may include loss of coordination and poor sense of balance, decreased reaction time, reduced ability to perform tasks requiring concentration and coordination, and altered motivation and cognition (US Department of Education, Higher Education Center, 1999). Moreover, marijuana use has been shown to be associated with poorer academic performance (US Department of Education, Higher Education Center, 1999). These effects may impede the ability of athletes to stay healthy to maximize performance in both competitive and academic settings.

Theoretical approaches to positive and negative health behaviors may illuminate the antecedents to risky substance use. The theory of Reasoned Action (Ajzen & Fishbein, 1980) for example, and its extension, the theory of Planned Behavior (TPB; Ajzen, 1985, 1991), identify subjective norms, personal attitudes, and perceived behavioral control as key determinants in predicting personal behavior. The TPB labels subjective norms as the perceptions of whether important others (or a peer referent group) approve or disapprove of a behavior. This theory purports that many decisions young adults make about behavioral choices are influenced by the perceived acceptability of that decision by one's peers. The TPB has been applied as a framework for understanding a wide range of behaviors (see review by Ajzen, 1991) including substance use (e.g., Conner, Warren, Close, & Sparks 1999; Norman & Conner, 2006). From the perspective of TPB, both attitudes towards substance use and normative beliefs about the specific substance use of fellow group members are expected to predict intentions to engage in that behavior.

The key element of normative beliefs influencing intentions has been further extended by another theory, described as the social norms approach, which has been widely used to study college students' substance use behaviors (see review by Berkowitz, 2004). This theory suggests that the majority of college students overestimate the norms of alcohol and marijuana use by their peers (Perkins, 2002; Perkins, Haines, & Rice, 2005) and that these overestimations directly influence one's personal level of use (Kilmer, Walker, Lee, Palmer, Mallette, Fabiano, & Larimer, 2006; Martens, Page, Mowry, Damann, Taylor & Cimini, 2006; Page & Scanlan, 1999; Prentice & Miller, 1993). In addition, the level of influence resulting from misperceptions becomes progressively larger as proximity of the reference group increases (Borsari & Carey, 2003; Korcуска & Thombs, 2003; Lewis & Neighbors, 2006). As such, strong peer reference groups (e.g., athletic teams) have tremendous influence on substance use decisions. In student-athlete samples, normative perceptions of athlete and non-athlete alcohol use are associated with individual alcohol consumption (e.g., Martens, Dams-O'Connor, Duffy-Paiement, & Gibson, 2006; Perkins & Craig, 2006). Moreover, Martens, Dams-O'Connor, and colleagues (2006) found athlete drinking norms to be more strongly associated with drinking in male athletes compared to female athletes. Non-athlete drinking norms predicted drinking among female athletes, a noteworthy finding

suggesting the importance of examining gender as a moderator of the influence of social norms on substance use among college athletes.

To our knowledge, one study has examined the association between perceptions of marijuana use and personal use among college athletes, in addition to comparing marijuana use among athletes to non-athletes (Page & Roland, 2004). The findings revealed greater past month (current) marijuana use among non-athletes compared to athletes (23.9% vs. 15.6%), although athletes reported slightly greater lifetime marijuana use than non-athletes (56.0% vs. 54.4%). Additionally, compared to non-users, those reporting past month marijuana use exhibited greater overestimations of marijuana use. These results are tempered by several limitations including assessment at only one site and the use of primarily first-year students as their comparison group. Further, the assessment of monthly and lifetime marijuana use was based on yes/no responses, and students were instructed to estimate the percentage of students who had used marijuana in the past month. The current study extends such research by measuring a wider range of personal and perceived marijuana use among a sample of intercollegiate athletes from two universities. It further narrows the specificity of prevalence assessments, by offering a more detailed examination of frequency, contrary to previous research that has primarily investigated yes/no responses of use in the past year or month (e.g. Page & Roland, 2004; Page & Scanlan, 1999). Based on previous research, we expected male athletes to report more frequent use than female athletes and that misperceptions of athlete marijuana use norms would be strongly associated with greater personal marijuana use. Further, we anticipated gender to moderate the association between normative misperceptions of marijuana use and personal use among athletes such that the relationship would be stronger among males than females (Page & Roland, 2004).

METHOD

Participants

A local Institutional Review Board approved the current study, which was part of a larger social norms intervention study. Data were collected on a population of intercollegiate athletes at two private, midsize universities, one on the West Coast and one on the East Coast. Out of 656 student-athletes who were invited to participate, 522 (80%) completed the study. The mean age of the sample was 19.52 years ($SD = 1.27$) and 54.3% were reportedly in their current athletic season. The majority of the participants were female (53.7%) and Caucasian (72.2%). The reported class years were as follows: 36.5% first year students, 24.5% sophomores, 25.4% juniors, 12.4% seniors, and 1.3% "other." All athletes competed at the NCAA Division 1 level at their respective institutions and all 14 sports at both schools were represented.

Design and Procedure

Prior to contacting coaches and team members regarding the study, permission was granted from the athletic directors at both sites. Then, at the beginning of the spring 2007 semester, each team was contacted and introduced to the study. They were told that they were invited to participate in a study about substance use, involving both marijuana and alcohol, and that

it could fulfill necessary health-related programming requirements from the Athletic Departments. Each coach agreed to participate and provided a team roster with members' e-mail addresses. A link to an online consent form and demographics questionnaire was then electronically mailed to every athlete at both institutions. The consent form provided further information about the study and contained assurances about confidentiality of individual and team responses. The questionnaire assessed several demographic variables including age, sex, class year, group membership, season-status, ethnicity, grade point average (GPA), and income.

Following consent and completion of this brief survey, the athlete were invited to attend a homogenous-gendered group meeting with several other teams at their institution. This meeting involved an anonymous and confidential, live assessment of perceived and actual behavior using wireless handheld "clickers." Questions and response options were projected onto a screen and participants were able to endorse their preferred responses by simply pushing the corresponding numbers on their wireless clickers. Participants were asked a question regarding perceived marijuana use of their fellow athletes at their institution. This question assessing the perceived norm directly referenced the school and gender group to which the individual belonged. Participants were then asked about their own individual marijuana use, which when aggregated with all responses, provided an overall measure of actual group behavior.

Perceived use was assessed by the following question: *How often does the typical [School name:Gender] athlete smoke marijuana?*

Actual use was assessed by the following question: *How often do you smoke marijuana?* For both questions, response options ranged from 1–9. Response 1 = "Never." Response 2 = "One to six times a year." Response 3 = "Once a month." Response 4 = "Two to three times a month." Response 5 = "Once a week." Response 6 = "Twice a week." Response 7 = "Three to four times a week." Response 8 = "Five to six times a week." Response 9 = "Everyday."

RESULTS

Personal Marijuana Use among Male and Female Athletes

Descriptive analyses of marijuana use among the 522 athletes in our sample indicated that 63.2% ($n = 330$) reported never using marijuana in their lifetime. Of the athletes ($n = 192$) reporting any marijuana use, 62% reported using marijuana one to six times per year, 9.9% reported using once a month, 12% reported using two to three times a month, 8.9% reported using between one to six times a week, and 7.8% reported daily marijuana use ($M = 1.83$, $SD = 1.68$ for overall sample). To examine sex differences in marijuana use, we conducted a t-test comparing marijuana use among male and female athletes. Results revealed compared to females ($M = 1.39$, $SD = 0.74$), males ($M = 2.46$, $SD = 2.37$) reported significantly greater marijuana use $t(474) = -7.067$, $p < .001$. We also examined sex differences among athletes reporting any marijuana use. Male users ($M = 3.99$, $SD = 2.58$) reported significantly greater marijuana use than female users ($M = 2.36$, $SD = .80$), $t(171) = -5.855$, $p < .001$.

Perceptions of Marijuana Use among Male and Female Athletes

We next examined perceptions of marijuana use by assessing perceptions of how often the “typical male/female athlete” uses marijuana. Overall, although only 36.8% of the athletes in our sample reported using marijuana, participants misperceived the frequency of marijuana use by “the typical male/female athlete”, with their estimation that 85.6% used marijuana at least once a year ($M = 2.90, SD = 1.76$). In terms of sex differences among perceptions of marijuana use, females estimated that 83.9% of “typical female athletes” smoked marijuana at least once a year ($M = 2.39, SD = 1.04$), although only 29.1% of female athletes in our sample reported marijuana use at least once a year. Male athletes also overestimated the frequency with which “the typical male athlete” uses marijuana, with males estimating that 88.8% use marijuana at least once a year ($M = 3.62, SD = 2.22$), although only 46.9% of male athletes in our sample reported using marijuana at least once a year. The overestimation of marijuana use among “typical male/female athletes” was also evident when non-users were excluded from analyses.

Associations between Normative Misperceptions and Personal Marijuana Use

To determine the association between misperceptions of marijuana use among male and female athletes and personal marijuana use, we used hierarchical linear regression (Cohen, Cohen, West, & Aiken, 2003). Sex was dummy coded (men = 1), and the perceived norm for marijuana use was mean centered to facilitate interpretation of parameter estimates. Demographics, including sex and age were entered at step 1, followed by perceived norms at step 2. Based on our interest in sex differences in marijuana use, the two-way product term of Sex \times Perceived Norms was entered in step 3.

Regression results are presented in Table 1. Results revealed a step 1 (R^2 change .100, $p < .001$) significant main effect for sex ($\beta = .30, p < .001$), with males reporting greater marijuana use than females. There was not a significant main effect for age ($\beta = .07, p = ns$). At step 2 (R^2 change = .104, $p < .001$), perceived marijuana use norms significantly predicted personal marijuana use ($\beta = .34, p < .001$) above and beyond the effects of sex and age. The interaction term entered at step 3 (R^2 change = .03, $p < .001$) for Sex \times Perceived Norms was significant. Tests of simple slopes were graphed and interpreted using procedures described by Aiken and West (1991). Figure 1 presents the significant two-way interaction between Sex \times Perceived Norms where high and low values for perceived marijuana use norms were specified as one standard deviation above and below the means. Examination of simple slopes revealed among female athletes, perceived norms for marijuana use by the typical athlete at their university was not significantly associated with personal marijuana use ($\beta = .02, p = ns$). However, among male athletes, perceived norms for marijuana use by the typical male athlete were significantly associated with greater personal marijuana use ($\beta = .45, p < .001$). Thus, normative beliefs about marijuana use were significantly associated with personal use exclusively among male athletes. Once again, these findings were evident when non-users were excluded from analyses.

DISCUSSION

The present research extends previous work in assessing the relationship between perceived norms of marijuana use and actual reported use among intercollegiate athletes. The frequency of marijuana use in the prior year was assessed in two samples of intercollegiate athletes from two universities on separate coasts. Although previous literature proposes that the prevalence rate among non-athletes is 30% for use in the prior year (CORE Institute, 2001) and approximately 28.4% among athletes (Green et al., 2001), 36.8% (including 46.9% of male athletes) of the current sample of 522 athletes reported using marijuana at least once in the prior year. Consistent with prior research, male athletes reported using marijuana significantly more often than female athletes. A surprising finding in this study is the extent of misperception with respect to marijuana use. While 29.1% of females and 46.9% of males reported using marijuana in the past year, they thought that 83.9% of “typical female athletes” for the females and 88.8% of “typical male athletes” for the males had used marijuana over the course of the same year. Finally, results from this study demonstrated that these exaggerated misperceptions affected marijuana use exclusively among male athletes, as perceived marijuana use among male athletes predicted personal use but this relationship was not found among female athletes.

The misperceptions documented in this study were more inaccurate than those reported in previous research. Further, the prevalence rates for use found in the current sample are higher than those in previous work. Although the reason for this higher reported prevalence on these two campuses is not known, both of these discrepancies may result from the variations in response options used across studies. An advantage of the current research is that unlike other studies that have used dichotomous response options (e.g. Page & Roland, 2004; Page & Scanlan, 1999), the current study provided a more sensitive assessment with nine response options. Future studies could work to standardize an assessment for evaluating frequency of perceived and actual marijuana use. Another potential reason for the relatively inflated norms is that the assessment was administered in a live setting. It is not clear whether or how the presence of others may have influenced perceived norms or self-reported behavior. Perhaps having fellow athletes visible while responding to questions may have primed them to recall those who they knew used marijuana while answering questions related to its use.

The gender differences in the association between normative misperceptions and personal marijuana use observed in the current study are noteworthy in light of previous research suggesting perceived norms of alcohol use among one's gender group predict individual behavior for both males and females (Lewis & Neighbors, 2004). Although all participants in the current sample reported similar gender-specific misperceptions regarding typical marijuana use of their fellow athletes, it is unclear why this seemed to be more strongly associated with males' use and not females.' One explanation may be that males' social identity may be more strongly tied to their athletic participation than females, such that athlete-specific norms are more influential for males (Martens, Dams-O'Connor, et al., 2006). Thus, athlete norms for marijuana use may be more relevant for male athletes than their female counterparts due to greater pressure for males to conform to perceived norms among their athlete peers. It is possible that marijuana use among athletes may be less

socially acceptable than perceived pressure to engage in alcohol use, particularly for females, and perceived norms may be less powerful predictors of individual marijuana use than other individual difference and social factors. Future research should therefore examine a broader range of female athletes' perceptions of marijuana use with regards to various sub-groups (e.g., closest friends) in the college environment, in an effort to determine what variables may influence their use. Recent research by Page and Roland (2004) suggests that the salience of perceived opposite sex norms (i.e., perceptions of males' marijuana use) may in fact influence female athletes' decisions to use. Ultimately, a number of individual factors (e.g., personality factors, motives) in conjunction with social influences likely contribute to marijuana use among college student athletes and non-athlete samples. Interestingly, one study found that college athletes reporting higher levels of extrinsic motivation for athletic involvement engaged in more frequent marijuana use compared to athletes with greater intrinsic motivation (Rockafellow & Saules, 2006). Further research should investigate the influence of both sport-specific and general cognitive, motivational, and social processes on marijuana use among athletes.

Results from this study have implications for normative based prevention and interventions efforts with intercollegiate athletes. The prevalence of marijuana use observed in these two samples is higher than previously identified. Coupled with gross overestimations of other athletes' behavior, these findings warrant immediate attention. Particularly among male athletes, these overestimations predict individual use, and provide a demonstration of the salience of group-specific marijuana norms information. The current study lends support for future intervention efforts using targeted social norms programs to reduce the discrepancy between perceived and actual marijuana use among male athletes. Reducing misperceptions of alcohol use within one's peer group has recently been shown to mediate the reduction in personal use (LaBrie, Hummer, Neighbors, & Pedersen, 2008). Moreover, it may be of added value to include a focused discussion on reasons why some athletes choose to not use marijuana. Research indicates that the two main reasons collegiate athletes refrain from marijuana use is because they have no desire for the intended effects and because they were concerned about their health (NCAA Research Staff, 2001). Better informing athletes of their peers' actual marijuana and other drug use, as well as highlighting the motivations for non-use, may prompt reduction of their own drug behavior.

Acknowledgments

This research was funded by a grant from the Alcoholic Beverage Medical Research Foundation and grant U18 AA015451-01 from the National Institute of Alcohol Abuse and Alcoholism.

REFERENCES

- Ajzen, I. From decisions to actions: A theory of planned behavior.. In: Kuhl, J.; Beckmann, J., editors. Action-control: From cognition to behavior. Springer; New York: 1985. p. 11-39.
- Ajzen I. The theory of Planned Behavior. *Organizational Behavior and Human Decision Processes*. 1991; 50:179–211.
- Ajzen, I.; Fishbein, M. *Understanding attitudes and predicting social behavior*. Prentice Hall; Englewood Cliff, NJ: 1980.
- Aiken, LS.; West, SG. *Multiple regression: testing and interpreting interactions*. Sage; Newbury Park, CA: 1991.

- Berkowitz AD. The social norms approach: Theory, research, and annotated bibliography. Retrieved June. 2004; 15:2007. from http://www.alanberkowitz.com/articles/social_norms.pdf.
- Borsari B, Carey KB. Descriptive and injunctive norms in college drinking: A meta-analytic integration. *Journal of Studies on Alcohol*. 2003; 64:331–341. [PubMed: 12817821]
- Cohen, J.; Cohen, P.; West, SG.; Aiken, LS. *Applied multiple regression/correlation analysis for the behavioral sciences*. 3rd ed.. Lawrence Erlbaum Associates; Mahwah, NJ: 2003.
- Conner M, Warren R, Close S, Sparks P. Alcohol consumption and the theory of planned behaviour: An examination of the cognitive mediation of past behavior. *Journal of Applied Social Psychology*. 1999; 29:1676–1704.
- CORE Institute. CORE Alcohol and Drug Survey. Southern Illinois University; Author; Carbondale, IL: 2001.
- Green GA, Uryasz FD, Petr TA, Bray CD. NCAA study of substance use and abuse habits of college student-athletes. *Clinical Journal of Sport Medicine*. 2001; 11:51–56. [PubMed: 11176146]
- Kilmer JR, Walker DD, Lee CM, Palmer RS, Mallett KA, Fabiano P, Larimer ME. Misperceptions of college student marijuana use: Implications for prevention. *Journal of Studies on Alcohol*. 2006; 67:277–281. [PubMed: 16562410]
- Korcuska JS, Thombs DL. Gender role conflicts and sex-specific drinking norms: Relationships to alcohol use in undergraduate women and men. *Journal of College Student Development*. 2003; 44:204–215.
- LaBrie JW, Hummer JF, Neighbors C, Pedersen ER. Live interactive group-specific normative feedback reduces misperceptions and drinking in college students: A randomized trial. *Psychology of Addictive Behaviors*. 2008; 22:141–148. [PubMed: 18298241]
- Lewis MA, Neighbors C. Gender-specific misperceptions of college student drinking norms. *Psychology of Addictive Behaviors*. 2004; 18:334–339. [PubMed: 15631605]
- Lewis MA, Neighbors C. Social norms approaches using descriptive drinking norms education: A review of the research on personalized normative feedback. *Journal of American College Health*. 2006; 54:213–218. [PubMed: 16450845]
- Martens MP, Dams-O'Connor K, Duffy-Paiement C, Gibson JT. Perceived alcohol use among friends and alcohol consumption among college athletes. *Psychology of Addictive Behaviors*. 2006; 20:178–184. [PubMed: 16784364]
- Martens, MP.; Dams-O'Connor, K.; Kilmer, JR. Alcohol and drug abuse among athletes: Prevalence, etiology, and interventions.. In: Tenenbaum, G.; Eklund, RC., editors. *Handbook of sport and exercise psychology*. 3rd ed.. John Wiley & Sons; Hoboken, NJ: 2007. p. 859-878.
- Martens MP, Page JC, Mowry ES, Damann KM, Taylor KK, Cimini MD. Differences between actual and perceived student norms: An examination of alcohol use, drug use, and sexual. *Journal of American College Health*. 2006; 54:295–300. [PubMed: 16539222]
- National Collegiate Athletic Association (NCAA) Research Staff. NCAA study of substance use habits of college student-athletes: The National Collegiate Athletic Association Committee on Competitive Safeguards and Medical Aspects of Sports. 2001. Retrieved March 20, 2008, from http://72.14.253.104/search?q=cache:AvTRguY8vDUJ:www.ncaa.org/library/research/substance_use_habits/2001/substance_use_habits.pdf+-NCAA+-study+-on+-substance+-use+-2001&hl=en&ct=clnk&cd=1=&gl=us&client=firefox-a
- Norman P, Connor M. The theory of planned behaviour and binge drinking: Assessing the moderating role of past behaviour within the theory of planned behaviour. *British Journal of Health Psychology*. 2006; 11:55–70. [PubMed: 16480555]
- Page RM, Roland M. Misperceptions of the prevalence of marijuana use among college students: Athletes and non-athletes. *Journal of Child and Adolescent Substance Abuse*. 2004; 14:61–75.
- Page RM, Scanlan A. Perceptions of the prevalence of marijuana use among college students: A comparison between current users and nonusers. *Journal of Child and Adolescent Substance Abuse*. 1999; 9:1–12.
- Perkins HW. Surveying the damage: A review of research on consequences of alcohol misuse in college populations. *Journal of Studies on Alcohol*. 2002; 14:91–100.
- Perkins HW, Craig DW. A successful social norms campaign to reduce alcohol misuse among college student-athletes. *Journal of Studies on Alcohol*. 2006; 67:880–889. [PubMed: 17061005]

- Perkins HW, Haines MP, Rice R. Misperceiving the college drinking norm and related problems: A nationwide study of exposure to prevention information, perceived norms and student alcohol misuse. *Journal of Studies on Alcohol*. 2005; 66:470–478. [PubMed: 16240554]
- Prentice DA, Miller DT. Pluralistic ignorance and alcohol use on campus: Some consequences of misperceiving the social norm. *Journal of Personality and Social Psychology*. 1993; 64:243–256. [PubMed: 8433272]
- Rockafellow BD, Saules KK. Substance use by college students: The role of intrinsic versus extrinsic motivation for athletic involvement. *Psychology of Addictive Behaviors*. 2006; 20:279–287. [PubMed: 16938065]
- Shillington AM, Clapp JD. Substance use problems reported by college students: Combined marijuana and alcohol use versus alcohol- only use. *Substance Use and Misuse*. 2001; 36:663–72. [PubMed: 11419493]
- Simons JS, Carey KB. An affective and cognitive model of marijuana and alcohol problems. *Addictive Behaviors*. 2006; 31:1578–1592. [PubMed: 16426771]
- Simons JS, Gaher RM, Correia CJ, Hansen CL, Christopher MS. An affective-motivational model of marijuana and alcohol problems among college students. *Psychology of Addictive Behaviors*. 2005; 19:326–34. [PubMed: 16187813]
- Department of Education US, Higher Education Center. Marijuana use among students of institutions of higher education. Retrieved March. 1999; 20:2008. from <http://www.higheredcenter.org/pubs/prev-updates/marijuana.html>.
- Wechsler H, Davenport AE, Dowdall GW, Grossman SJ, Zanakos SI. Binge drinking, tobacco, and illicit drug use and involvement in college athletics. *Journal of American College Health*. 1997; 45:195–200. [PubMed: 9069676]

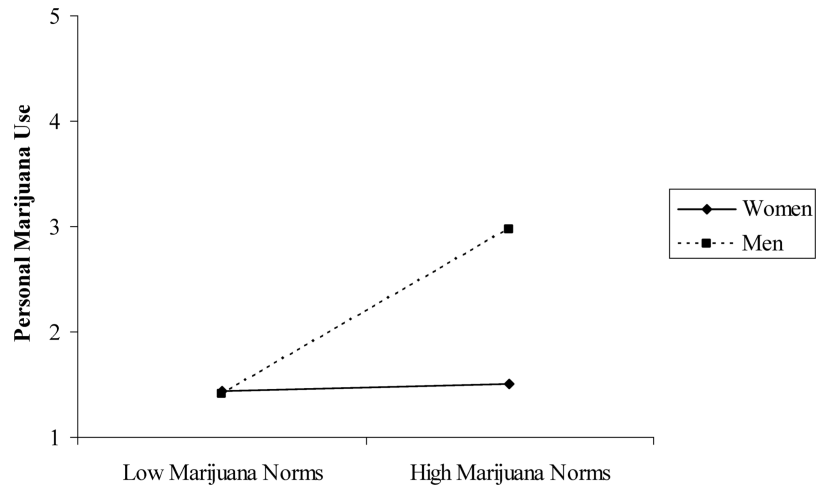


Figure 1.
Two-way interaction involving sex and perceived norms.

Table 1

Marijuana Use as a Function of Sex, Age, and Normative Beliefs

	All Participants (n = 522)	Males (n = 196)	Females (n = 280)
1	.100	.011	.148
Sex	0.30	6.85*	.000
Age	0.07	1.59	0.11
		1.45	0.02
2	.104	.000	.167
Marijuana Use	0.34	7.77*	0.41
		6.21*	0.04
Norms (same sex)			0.59
3	.030	.000	
Sex X Norms	0.57	4.27*	

* $p < .001$.