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Direct and indirect effects of injunctive norms on marijuana use:

The role of reference group

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Abstract

Objective: Little work has evaluated the relationship between injunctive norms and marijuana use. This study sought to establish whether misperceptions exist between perceived injunctive norms of typical college students and the actual approval level of the students. We also examined respondents' perceptions of which groups (typical student, close friends, and parents) were the most and least approving of marijuana. These variables were then applied to an explanatory model to assess their relationships with marijuana use. Method: Participants were 3753 students (61% female) randomly recruited from two west-coast campuses. Participants were asked about their own marijuana use and their own approval toward marijuana. Injunctive norms were assessed by asking respondents about their perceptions of how much other reference groups approved of marijuana. Results: Students overestimated the extent to which the typical student approves of marijuana use. A path model showed that perceived approval of both close friends and parents predicted actual/self approval which, in turn, was most predictive of personal marijuana use. Perceptions of typical student and close friends approval also directly predicted one's own use, while the path from parental approval to marijuana use was fully mediated by one's own approval. Conclusions: Findings suggest that perceived injunctive norms may function differently with respect to marijuana use than they do with respect to alcohol use and raise questions about how to incorporate social normative information into marijuana interventions.

Approximately 46% of college students report having tried marijuana, 30% report use in the past year, and 16% report past 30-day use (Gledhill-Hoyt et al., 2000; Johnston et al., 2007). Problematic marijuana use is associated with psychological and physical consequences (Simons and Carey, 2006), as well as short-term cognitive impairments in educational performance (Hall et al., 1999; Pope and Yurgelan-Todd, 1996). Given the prevalence of use and potential for harmful consequences, it is important to identify correlates and predictors of use that can be incorporated into prevention and intervention efforts across universities.

Social norms theory (see Berkowitz, 2004; Perkins, 2003) provides a model for substance use by postulating that indirect peer influence, in the form of perceptions, affects an individual's own behavior, regardless of the accuracy of the perceived norm. Social norms theory generally distinguishes between two types of norms: descriptive and injunctive. Descriptive norms refer to the beliefs regarding the prevalence of a specific behavior in a particular population, usually one's peers. Most college students overestimate the percentage of students who use marijuana on college campuses (Page and Scanlan, 1999) and such overestimation of descriptive norms has been shown to predict individual marijuana use (Kilmer et al., 2006; Neighbors, Geisner, et al., 2008).

Injunctive norms are the perceived level of approval of specific behaviors (Cialdini et al., 1990). Recent research involving marijuana and social norms assessed a sample of high school graduates during the summer prior to attending college (Neighbors, Geisner, et al., 2008). Based on the perceptions of 'close friend' norms, a positive relationship emerged between both descriptive and injunctive norms on individual marijuana use. This study was an important first step toward understanding how injunctive norms influence individual decisions about marijuana use. Yet beyond it, relatively little is known including how perceptions of other referents may

influence individuals during their actual college tenure. Previous research has revealed the critical importance of considering the specificity of the reference group in the relationship between injunctive norms and alcohol use (Neighbors, O'Connor, et al., 2008). Thus, it is important to understand the links between perceived injunctive norms for various reference groups and marijuana use in order to determine what types of normative education, if any, may be appropriate and effective (Mattern and Neighbors, 2004).

The current study seeks to establish whether misperceptions exist between the perceptions of what constitutes perceived approval of typical college students (injunctive norms) and the actual approval level of the students. We expected that students would overestimate the permissiveness of fellow students with regard to marijuana use. Next we sought to examine respondents' perceptions of which groups (typical student, close friends, and parents) were the most and least approving of marijuana, especially in comparison to one's own actual level of approval. We expected the order of perceived approval to be highest for typical students, followed by close friend approval, then by one's own level of approval, and lastly to be lowest among parents. Finally, a path model was used to determine the relationships concerning injunctive norms of the various reference groups, one's level of approval, and actual use. We hypothesized that perceived injunctive norms of each reference group on individual marijuana use would be mediated by one's level of approval

Method

Participants

The current research utilized a large representative sample across class years and from two campus sites, one a large public university and the other a mid-sized private university. Participants were recruited from a random sample of 7000 students (3500 from each campus).

Out of the 7000 students, 3753 (61% female) consented to participate and completed an online survey during fall 2007. Participants had a mean age of 19.88 years ($SD = 1.36$) and identified themselves as follows: 54.7% Caucasian, 18.5% Asian, 12.7% Hispanic/Latino, and 14.1% as other.

Design and Procedure

During the first weeks of the fall semester/quarter, students randomly selected from the Registrar's lists received a letter inviting their participation in a larger IRB approved social norms research study and were provided with a survey link and unique Personal Identification Number (PIN). Students subsequently also received an email with a link to the online survey, and once they clicked on the link, they entered their unique pin number and were taken to the informed consent form and confidential survey. Participants were paid \$20 for completing this survey.

Measures

Self approval and injunctive norms. Participants were first asked about their actual/self approval of four behaviors concerning marijuana use (Neighbors, Geisner, et al., 2008): (1) abstaining from marijuana use, (2) trying marijuana once or twice, (3) smoking marijuana occasionally, and (4) smoking marijuana regularly. Injunctive norms were assessed by asking participants about their perceptions of how much each of three other reference groups approved of these four marijuana behaviors. Specifically, they reported their perceived level of marijuana approval by: the typical student on their campus, their close friends, and their parents. Response options for both self-approval and injunctive norms items were on a scale ranging from 1 (*strongly disapprove*) to 7 (*strongly approve*). The first item for both, referring to abstaining from use, was reversed scored. Composites were then computed for the actual/self approval ($\alpha =$

.77), perceived typical student approval ($\alpha = .69$), perceived close friend approval ($\alpha = .80$), and perceived parental approval ($\alpha = .69$).

Marijuana use. Marijuana use behavior was assessed using three questions: (1) “In the past year, how many occasions did you use marijuana?” (2) “How many days did you smoke marijuana during the past year?” (3) “How many days did you smoke marijuana during the past month?” The items were anchored on scales from 0 (*never*) to 6 (*40 or more times*), 0 (*never*) to 9 (*everyday*), and 0 (*I did not smoke at all*) to 9 (*everyday*), respectively. These three frequency of marijuana use items, because of variation in scales, were standardized and then averaged to form a marijuana use composite ($\alpha = .94$).

Results

Participant Marijuana Use and Perceived Typical Student Approval vs. Actual/Self Approval

Forty percent of the 3753 students who participated in the study ($n = 1425$; 43.1% of male sample and 38.0% of female sample) reported using marijuana at least once within the past year. Of the male participants ($n = 591$) reporting any marijuana use, 59.4% reported using marijuana at least once a month. Of the female participants ($n = 834$) reporting any marijuana use, 46.5% reported using marijuana at least once a month.

Perceived typical student approval ($M = 3.94$, $SD = 1.04$) was found to be significantly higher than actual/self approval of marijuana ($M = 3.11$, $SD = 1.35$), paired $t(3575) = 34.48$, $p < .001$. The finding shows that a misperception exists between perceived marijuana approval of typical students and the extent in which students personally approve of marijuana

Direction of Approval Perception Relative to Self

Next, we determined which groups were perceived to be the most and least approving of marijuana. Mean scores were highest for perceived typical student approval ($M = 3.94$, $SD =$

1.04), followed by perceived close friend approval ($M = 3.49$, $SD = 1.43$), then by actual/self approval ($M = 3.11$, $SD = 1.35$), and lowest for perceived parental approval ($M = 2.02$, $SD = 1.13$). All possible paired t -test comparisons between these four composites were found to be statistically significant, $ps < .001$.

Correlations between Approval and Marijuana use

The marijuana use construct positively correlated with actual/self approval ($r = .59$, $p < .001$), close friends approval ($r = .46$, $p < .001$), and parental approval ($r = .33$, $p < .001$), but surprisingly not with typical student approval ($r = .04$, ns). Actual/self approval positively correlated with typical student approval ($r = .31$, $p < .001$), close friends approval ($r = .70$, $p < .001$), and parental approval ($r = .55$, $p < .001$).

Predictive Model

Finally, a path analytic model offered a more comprehensive view of the pathways from injunctive norms to marijuana use. The model was specified with the EQS 6.1 program (Bentler, 2001), and estimated with Maximum Likelihood. Several criteria were used to evaluate overall fit of the model: Chi-square which is sensitive to model rejection when sample size is large (Bollen, 1989), CFI and NNFI with values ranging from 0 to 1.00—higher values representing a model that better approximates the underlying data (Ullman and Bentler, 2003), and RMSEA value which indicates that models greater than .10 are poor fitting.

In the hypothesized model, injunctive norms of typical student approval, perceived close friends approval, and perceived parental approval were allowed to correlate, and these three referent groups were specified to predict actual/self approval. Actual/self approval, in turn, was specified to predict marijuana use. Results show that the hypothesized model was of acceptable fit, $X^2(df = 3) = 201.13$, $p < .001$, CFI = .97, NNFI = .89. The RMSEA value, however was

found to be .14. Lagrange Multiplier (LM) tests suggest that the model could be improved by adding two direct paths: (a) perceived typical student approval to marijuana use; and (b) perceived close friends approval to marijuana use. The final model, incorporating these two additional paths, was shown to be good fitting, $X^2 (df = 1) = .01$, ns, CFI = 1.00, NNFI = 1.00, RMSEA = .00.

The final model, displayed in Figure 1, shows that the injunctive norms concerning typical student, close friends, and parents predicted higher actual/self approval, as anticipated actual/self approval, in turn, directly predicted higher marijuana use, also as anticipated. Further, perceived close friends approval was linked to higher marijuana use. After controlling for self approval and the perceived approval of close friends, a suppression effect emerged, such that high perceived typical student approval was associated with decreased marijuana use. There was no direct link between perceived parental approval and marijuana use, indicating that actual/self approval completely mediated this pathway (Baron and Kenny, 1986).

Discussion

Importantly, college students do indeed misperceive the extent to which their peers approve of marijuana use. They believe that other students are more approving of marijuana use than they actually are. Beyond documenting misperceptions of injunctive norms for marijuana and varying perceived levels of approval for typical students, close friends, and parents, the current study sought to understand the influence of these injunctive norms on student marijuana use. While we found no significant correlation between perceived typical student approval and personal marijuana use, moderately strong bivariate relationships were evidenced between perceived close friend approval, perceived parental approval, one's own personal approval and their actual marijuana use. When all the study's variables were entered into a structural equation

model that simultaneously examined their relationships, perceived approval of a typical student, close friends, and parents were each associated with one's own personal approval, which was in turn, was most predictive of personal marijuana use. In fact, perceived parental approval's relationship to use was fully mediated by self approval, suggesting that parents appear to have a continued, if indirect, influence on college student marijuana use. In a similar manner, perception of close friend approval was partially mediated by self approval, suggesting both direct and indirect effects on individuals' behavioral decisions about using marijuana. In the overall model and with all paths considered, there did emerge a very weak mediated link between perceived typical student approval and use, as well as a suppression effect direct link. Yet this was far outweighed by the clearly more influential referents of one's friends and parents.

Implications

The current results suggest that specificity of reference group may play an important role in the development of personal attitudes about marijuana use and for targeting in prevention and intervention programs. Perceived typical student approval was not correlated to marijuana use, suggesting that unlike normative interventions targeting alcohol use, an approach focusing on normative reeducation of typical student injunctive norms for marijuana use may not be appropriate for college students. This may be partially due to the fact that marijuana is an illicit substance and use is not as prevalent, visible, nor socially acceptable as alcohol. Therefore, distal reference group norms may not be a salient source of influence to college students. Rather, it is likely that the other reference groups (close friends and parents) are not only more proximal, but that students who use marijuana are more greatly influenced by them both positively and negatively. Theoretical perspectives suggest that the power of social norms is determined largely by their salience—operationalized partially as identification with the group in question (Rimal

and Real, 2003; 2005). Future research may wish to examine the extent to which identification with the typical college student, in addition to other reference groups, may influence the observed relationships.

Neighbors et al. (2008) found that marijuana related injunctive norms for close friends were uniquely associated with marijuana use for incoming students and that the relationship between descriptive marijuana norms for friends and use was moderated by greater injunctive marijuana norms. Findings from the present study support the further exploration of the potential clinical impact of including close friend approval into college student marijuana interventions, as well as exploring how combining descriptive and injunctive norms into intervention strategies may positively impact desired outcomes. For example, in-person interventions may include components discussing the quantity or frequency of marijuana use for their friends and the extent to which their friends approve of their use and what reductions in use might mean for their relationships with friends, particularly for students who are higher in social expectancies. Yet students may be less likely to misperceive the attitudes of their close friends, unlike the relatively large misperception of “typical students.” Thus, the documentation of misperceptions of close friend injunctive norms is an important avenue for future research.

Interestingly, findings from the alcohol literature suggest that parental attitudes and opinions continue to matter in college student alcohol use. In fact, parent interventions focusing on increasing parent communication have been found to reduce alcohol use during the transition to college (Turrisi et al., 2009). Findings from the present study suggest that it may be worth exploring the utility of strengthening the communication between parents and college students about expectations and attitudes regarding marijuana use, particularly if parents are not approving of use.

Limitations and Future Directions

The model we evaluated was cross-sectional and causal reference should not be implied. Future research could longitudinally examine the extent to which perceived injunctive marijuana norms influence personal attitudes and marijuana use. Future research should also make an effort to directly ask the individual to describe firsthand what he/she considers to be the most salient sources of influence informing his/her personal attitudes towards marijuana use. Combining active and passive social influence predictors into prognostic models may broaden the understanding of how to affect positive personal decision making about health-risk behaviors. Finally, it remains to be seen whether perceptions of friends and parents' attitudes can be experimentally manipulated to achieve reductions in problematic or regular marijuana use. Future research is certainly needed to more fully understand the nature of these relationships and how to best deliver, if at all, effective social norms prevention and intervention messages around marijuana.

References

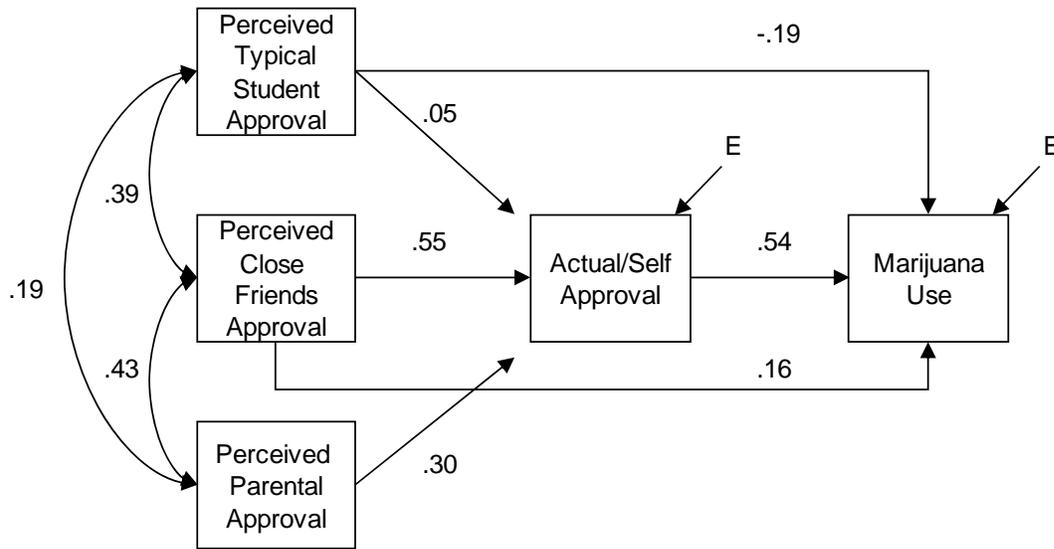
- Baron, R. M., & Kenny, D. A. (1986). The moderator-mediator variable distinction in social psychological research: conceptual, strategic and statistical considerations. *Journal of Personality and Social Psychology*, *51*, 1173-1182.
- Bentler, P. M. (2001). EQS 6 structural equations program manual. Encino, CA: Multivariate Software.
- Berkowitz, A. D. (2004). The social norms approach: Theory, research, and annotated bibliography. Retrieved from http://www.alanberkowitz.com/articles/social_norms.pdf
- Bollen, K. A. (1989). Structural equations with latent variables. New York: Wiley.
- Cialdini, R. B., Reno, R. R., & Kallgren, C. A. (1990). A focus theory of normative conduct: Recycling the concept of norms to reduce littering in public places. *Journal of Personality and Social Psychology*, *58*(6), 1015-1026.
- Glendhill-Hoyt, J., Lee, H., Strote, J., & Wechsler, H. (2000). Increases use of marijuana and other illicit drugs at US colleges in the 1990s: Results of three national surveys. *Addiction*, *95*, 1655-1667.
- Hall, W., Johnston, L., & Donnelly, N. (1999). The epidemiology of cannabis use and its consequences. In: H. Kalant, W.A. Corrigall, W. Hall and R.G. Smart, Editors, *The health effects of cannabis*, Centre for Addiction and Mental Health, Canada, 71-125.
- Johnston, L., O'Malley, P., Bachman, J., & Schulenberg, J. E. (2007). *Monitoring the Future national survey results on drug use, 1975-2006: Volume II, College students and adults ages 19-45*. Bethesda, MD: National Institute on Drug Abuse.

- Kilmer, J. R., Walker, D. D., Lee, C. M., Palmer, R. S., Mallett, K. A., Fabiano, P., et al. (2006). Misperceptions of college student marijuana use: Implications for prevention. *Journal of Studies on Alcohol*, 67(2), 277-281.
- Mattern, J. L., & Neighbors, C. (2004). Social norms campaigns: Examining the relationship between changes in perceived norms and changes in drinking levels. *Journal of Studies on Alcohol*, 65, 489-493.
- Neighbors, C., Geisner, I. M., & Lee, C. M. (2008). Perceived marijuana norms and social expectancies among entering college student marijuana users. *Psychology of Addictive Behaviors*, 22, 433-438.
- Neighbors, C., O'Connor, R. M., Lewis, M. A., Chawla, N., Lee, C. M., & Fossos, N. (2008). The relative impact of injunctive norms on college student drinking: The role of reference group. *Psychology of Addictive Behaviors*, 22, 576-581.
- Page, R. M., & Scanlan, A. (1999). Perceptions of the prevalence of marijuana use among college students: A comparison between current users and nonusers. *Journal of Child & Adolescent Substance Abuse*, 9(2), 1-12.
- Perkins, H. W. (2003). *The social norms approach to preventing school and college age substance abuse: A handbook for educators, counselors, and clinicians*. San Francisco, CA, US: Jossey-Bass.
- Pope, H. G. & Yurgelan-Todd, D. (1996). The residual cognitive effects of heavy marijuana use in college students. *JAMA*, 275, 521-527.
- Rimal, R. N., & Real, K. (2003). Understanding the influence of perceived norms on behaviors. *Communication Theory*, 13, 184-203.

- Rimal, R. N., & Real, K. (2005). How behaviors are influenced by perceived norms: A test of the theory of normative social behavior. *Communication Research, 32*, 389-414.
- Simons, J. S., & Carey, K. B. (2006). An affective and cognitive model of marijuana and alcohol problems. *Addictive Behaviors, 31*(9), 1578-1592.
- Turrisi, R., Larimer, M. E., Mallett, K. A., Kilmer, J. R., Ray, A. E., Mastroleo, N. R., et al. (2009). A randomized clinical trial evaluating a combined alcohol intervention for high-risk college students. *Journal of Studies on Alcohol and Drugs, 70*, 555-567.
- Ullman, J. B., & Bentler, P. M. (2003). Structural equation modeling. In J. A. Schinka, & W. F. Velicer (Eds.) *Handbook of psychology* (pp. 607-634). Hoboken, NJ: Wiley.

Figure Caption

Figure 1. Predictive model of marijuana approval and marijuana use.



Note. All paths (standardized coefficients) are significant at $p < .001$. E = error term. Actual/self approval $R^2 = .57$. Marijuana use $R^2 = .39$.