Direct and Indirect Effects of Injunctive Norms on Marijuana Use: The Role of Reference Groups*

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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 3,753 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, whereas 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. (*J. Stud. Alcohol Drugs, 71,* 904-908, 2010)

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 et al., 2008a).

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 before attending college (Neighbors et al., 2008a). 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 et al., 2008b). Thus, to determine what types of normative education, if any, may be appropriate and effective, it is important to understand the links between perceived injunctive norms for various reference groups and marijuana use (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 with one's own actual level of approval. We expected the

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order of perceived approval to be highest for typical students, followed by close friends' approval, and then one's own level of approval; last, we expected perceived approval 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 the relationships between perceived injunctive norms of each reference group and individual marijuana use would be mediated by one's level of approval.

Method

Participants

The current research used 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 7,000 students (3,500 from each campus). Of the 7,000 students, 3,753 (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% White, 18.5% Asian, 12.7% Hispanic/Latino, and 14.1% "other."

Design and procedure

During the first weeks of the fall semester/quarter, students who were randomly selected from the registrar's lists received a letter inviting their participation in a larger institutional review board–approved social-norms research study and were provided with a survey link and unique personal identification number. Students subsequently also received an email with a link to the online survey, and once they clicked on the link, they entered their unique personal identification 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 et al., 2008a): (a) abstaining from marijuana use, (b) trying marijuana once or twice, (c) smoking marijuana occasionally, and (d) 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 (α = .77), perceived typical-student approval (α = .69), perceived close friends' approval (α = .80), and perceived parental approval (α = .69).

Marijuana use. Marijuana-use behavior was assessed using three questions: (a) "In the past year, how many occasions did you use marijuana?" (b) "How many days did you smoke marijuana during the past year?" (c) "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. Because of variation in scales, these three items discerning frequency of marijuana use were standardized and then averaged to form a marijuana-use composite (α = .94).

Results

Participant marijuana use and perceived typical-student approval vs. actual/self-approval

Forty percent of the 3,753 students who participated in the study (n = 1,501; 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 = 631) reporting any marijuana use, 59.4% reported using marijuana at least once a month. Of the female participants (n = 870) 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 to 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 friends' 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, N.S.). 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: (a) chi-square, which is sensitive to model rejection when sample size is large (Bollen, 1989); (b) comparative fit index (CFI) and nonnormed fit index (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 (c) root mean square error of approximation (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, $\chi^2(3) = 201.13$, p < .001, CFI = .97, NNFI = .89. The RMSEA value, however, was found to be .14. Lagrange multiplier tests suggested 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, $\chi^2(1) = 0.01$, N.S., 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; actual/self-approval, in turn, directly predicted higher marijuana use. 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. Although we found no significant correlation between

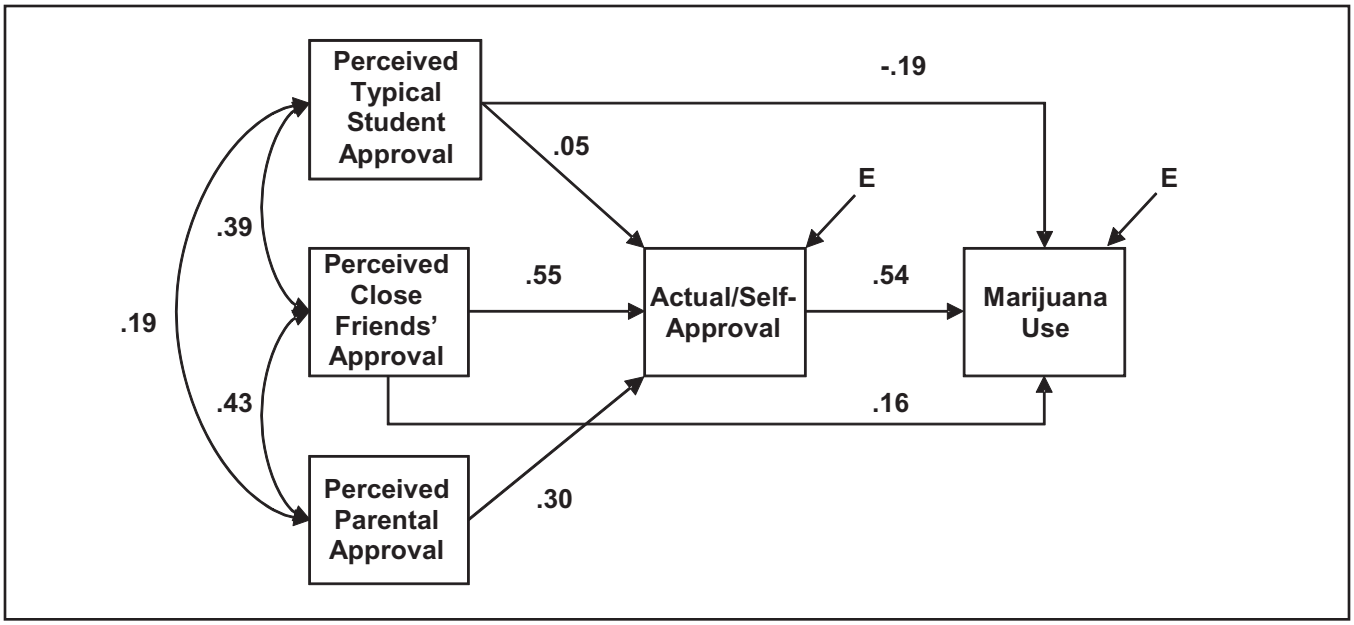

FIGURE 1. Predictive model of marijuana approval and marijuana use. All paths (standardized coefficients) are significant at p < .001. E = error term. Actual/self-approval: R^2 = .57. Marijuana use: R^2 = .39.

perceived typical-student approval and personal marijuana use, moderately strong bivariate relationships were evidenced between a student's actual marijuana use and perceived close friends' approval, perceived parental approval, and one's own personal approval. 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 in turn was most predictive of personal marijuana use. In fact, the relationship of perceived parental approval 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 friends' 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 re-education of typical-student injunctive norms for marijuana use may not be appropriate for college students. This partially may be because marijuana is an illicit substance and use is not as prevalent, visible, or 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 also that students who use marijuana are more greatly influenced by other reference groups, 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. (2008a) 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 friends' approval into college-student marijuana interventions, as well as how combining descriptive and injunctive norms into intervention strategies may positively affect desired outcomes. For example, in-person interventions may include components discussing the quantity or frequency of marijuana use for their friends; 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 or she considers to be the most salient sources of influence informing his or her personal attitudes toward 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 understand more fully the nature of these relationships and how to best deliver, if at all, effective social-norms prevention and intervention messages to deter marijuana use.

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