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Being Blunt About Marijuana: Parent Communication About Marijuana with Their Emerging Adult Children

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Abstract

While research suggests that parents continue to influence students' marijuana use after matriculation to college, there is limited data examining how parents communicate about marijuana use and what impact parent marijuana communication has on college student outcomes. The aim of the current study is to investigate the types of parent marijuana messages that college students receive and the relationship between parent communication and students' marijuana attitudes and behaviors. Students ($N = 506$) completed a survey assessing marijuana approval, use, negative consequences, and parent communication. A factor analysis of parent communication items yielded three factors: risk communication, permissive communication, and marijuana use communication. Risk communication was the most common form of communication. In multivariate models, risk communication was associated with increased odds of a student remaining abstinent but not with frequency of marijuana use or negative consequences. Greater permissive communication was associated with more approving student attitudes, greater odds of non-abstinence, more frequent use in the past year, and more negative consequences. These findings highlight the need to consider the different types of messages parents deliver when designing interventions aimed at engaging parents in marijuana prevention efforts.

Keywords

Marijuana use; Parent communication; College; Marijuana consequences

Marijuana is the most commonly used recreational drug by college students in the USA (Johnston et al. 2013). Since 2006, marijuana use has increased by 35 %, and it is projected

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Compliance with Ethical Standards The universities' Institutional Review Boards approved all measures and procedures prior to data collection.

Conflict of Interest The authors declare that they have no competing interests.

Ethical Approval All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Informed Consent Informed consent was obtained from all individual participants included in the study.

to continue to increase due to various changes in its legal status (Johnston et al. 2013). Heavy marijuana use is associated with a number of negative academic outcomes, including memory problems, missing class, and poor academic performance (Buckner et al. 2012; Caldeira et al. 2008; Norberg et al. 2011). Given both the increase of marijuana use by college students and the potential negative consequences, it is important to identify and understand the social and environmental factors that contribute to student use.

Despite the transition to college often marking a period of greater independence from parents, a growing body of research suggests that parents may still have a significant impact on their child's substance use behaviors even after matriculation (Abar and Turrissi 2008; LaBrie et al. 2011b; LaBrie and Sessoms 2012; Turrissi and Ray 2010). Most of this research on parental influence focuses on alcohol use. For example, when students believe their parents hold more permissive attitudes toward drinking they report more frequent heavy episodic drinking (Wood et al. 2004) and more negative alcohol-related consequences (Boyle and Boekeloo 2006; LaBrie et al. 2010b). A few studies also suggest that a number of parent-related factors are associated with young adults' marijuana use. Among adolescents, greater parental support (de Looze et al. 2012), greater parental monitoring (Bahr et al. 2005; Lac and Crano 2009), and closer identification with parents (Brook et al. 2001) are associated with less marijuana use. Research among college students suggests that parental monitoring both prior to college and after matriculation is associated with less marijuana use during college (Napper et al. 2015a; Pinchevsky et al. 2012) and fewer increases in marijuana use in college (White et al. 2006). In addition, the less approving college students perceive their parents to be of marijuana use, the less approving the students themselves are of its use (Napper et al. 2015a) and the less likely they are to use (LaBrie et al. 2010a).

Despite the fact that parent communication is one of the primary ways in which parents can express their values, concerns, and expectations regarding marijuana, there has been a lack of research exploring parent marijuana communication with emerging adults. Further, the limited studies that have examined parent communication with adolescents have produced mixed results. For example, Andrews and colleagues (1993) found that when single mothers warned their adolescent children about the health consequences of using marijuana, their child was less likely to initiate marijuana use. In contrast, warnings from mothers in two-parent families were not associated with initiation and fathers' warnings regardless of marital status were associated with greater odds of marijuana initiation. Similarly, more frequent parent communication about drugs in general is associated with earlier marijuana initiation (Nonnemaker et al. 2012). In the context of college student alcohol use, some research has illustrated the protective benefits of communication (LaBrie and Cail 2011; Small et al. 2011; Turrissi et al. 2001; Turrissi et al. 2007; Wood et al. 2004), while other studies have found that more frequent parent communications is associated with greater alcohol consumption (Boyle and Boekeloo 2009; Turrissi et al. 2007).

One potential explanation for these inconsistent findings is that communication is multidimensional and the construct has been operationalized differently across studies (Ennett et al. 2001; Kam et al. 2015; Napper et al. 2015b). Parent communication about marijuana could include warnings about potential risks, discussion of parental disapproval,

or tips on handling peer pressure. On the other hand, parents may also communicate acceptance of use or talk openly with their child about how to use drugs responsibly. Simply assessing how often parents talk about topics such as marijuana use may not adequately capture the complex nature of parent communication. Indeed, research examining parent–student alcohol communication suggests that some forms of communication may be more protective than others. For instance, Turrissi and colleagues (2007) found that among college athletes, communication about the social (e.g., embarrassment to family) and legal risks (e.g., getting into trouble with the police) of alcohol use were associated with increases in heavy drinking. In contrast, parental communication about the physical risks of alcohol consumption was associated with less frequent heavy drinking. Additionally, abstinence and zero-tolerance communication are associated with less alcohol use and greater use of protective drinking strategies (Abar et al. 2012; LaBrie et al. 2015). In contrast, harm-reduction messages (e.g., limiting drinks, avoiding drinking too fast) are associated with greater alcohol use (Abar et al. 2012; LaBrie et al. 2015). The increased use associated with harm-reduction messages may reflect that parents are not communicating effective harm-reduction strategies or that students are interpreting these messages as parental approval of alcohol use (Abar et al. 2012).

While past research highlights the complex nature of parent discussions about alcohol, it is unclear how parents address marijuana use with college students. Given the changing legal status of marijuana in the USA and the often ambiguous presentation of the risks and benefits of marijuana in the media (Mirken 2006), parents may be challenged to address marijuana use with their college-age children. To our knowledge, the current study is the first to explore the nature of parent–student communication about marijuana and the associations between parent communication and students’ marijuana-related behaviors. We explore the frequency of a range of communication content varying from warnings about the risk of marijuana, asking students about their use, and permissive messaging about marijuana. On the basis of previous alcohol research that indicates that permissive communication may be related to greater risk behaviors (Abar et al. 2012), we hypothesized that permissive communication would be more strongly positively related to student marijuana approval, use, and negative consequences compared to warnings about the risks of marijuana. Furthermore, we expected perceived parental approval of marijuana to be positively related to permissive communication and negatively associated with communication related to the negative consequences of use (Kam et al. 2015).

Method

Participants

A total of 506 students from two private mid-size universities took part in the study. At the time of the study, one study site was located in an area that had decriminalized marijuana and legalized medical marijuana. The other site was in an area where marijuana had not been decriminalized or legalized in any form. There were no significant differences between the sites in terms of rate of marijuana use, frequency of marijuana use, or marijuana consequences. The majority of the students were female 57.7 % ($n = 292$) and had a mean age of 18.8 years ($SD = 1.01$). The student sample was 62.5 % ($n = 314$) White, 17.5 % ($n =$

85) Asian, 8.2 % ($n = 41$) other, 7.8 % ($n = 39$) multiracial, 3.2 % ($n = 16$) Black or African American, 0.8 % ($n = 4$) Native Hawaiian/Pacific Islander, and 0.6 % ($n = 3$) American Indian/Alaskan Native. In addition, 17.0 % identified as Hispanic or Latino(a). Overall, 51.8 % of the sample reported having used marijuana at least once in the past 12 months, with 14.1 % reporting using more than once a week in the past year. Among those who had used marijuana, 95.8 % reported smoking marijuana, 50.6 % using a vaporizer, and 49.8 % eating a marijuana product.

Procedure

Participants were recruited through the psychology department subject pools at each institution. The majority of participants (85.2 %) completed an in-person web-based survey in a private laboratory setting, while 14.8 % of participants were emailed a description of the study and completed the survey online. Participants were granted course credit for taking part in the study and were informed that their responses would not be linked to identifying information. The universities' Institutional Review Boards approved all measures and procedures prior to data collection.

Measures

Parental Communication—Participants completed 26 items assessing parent–child communication about marijuana in the past 12 months. For example, students reported on how often parents warned them about the dangers of using marijuana and gave them advice on how not to get caught using marijuana (see Table 1 for full list of items). Items were created based on existing measures on alcohol communication (Ennett et al. 2001; Miller-Day and Kam 2010; Turrissi et al. 2007) and a small focus group of college students ($n = 6$) who were asked to describe the types of parent marijuana communication they had experienced or observed. Response options were measured on a 7-point Likert scale ranging from 0 (*Never*) to 6 (*More than 12 times*).

Marijuana Approval—Parent and student approval of marijuana were assessed by asking participants how much they approve of using marijuana and how much their parents approve of them using marijuana (Neighbors et al. 2008). These questions were measured on a 7-point Likert scale, ranging from 0 (*Unacceptable*) to 6 (*Acceptable*).

Marijuana Use—Participants were asked, “In the past year, on how many occasions did you use marijuana?” Adapted from LaBrie et al. (2011a), responses were measured on a Likert scale ranging from 0 (*Never*) to 8 (*Daily*). Students were classified as non-users if they reported no marijuana use in the past year ($n = 244$, 48.3 %). Students were classified as light users if reported using once a month or less in the past year ($n = 147$, 29.1 %). Students were classified as moderate-to-heavy users if they reported using marijuana more than once a month in the past year ($n = 114$, 22.6 %).¹

¹Our classification system was based, in part, on how marijuana users typically self-identified. For example, in the current sample, all students who reported that they self-identified as a moderate or heavy marijuana user also reported using marijuana at least twice a month.

Marijuana Consequences—Participants were asked to indicate the number of times they experienced 28 consequences in the past 60 days when they were using marijuana using a modified version of the Rutgers Marijuana Problem Index (Lee et al. 2013). Example items include “went to work high” and “neglected your responsibilities.” The scale ranged from 0 (*0 times*) to 4 (*more than 10 times*). A sum composite was created with higher scores indicating a greater number of consequences due to marijuana use.

Analysis Plan

Item analyses were performed to examine the most common communication content and the association between marijuana use and parent communication. The Sidak corrections were used to address the increased chance of a type 1 error due to making multiple comparisons (corrected critical $p = 0.0018$). In order to explore different dimensions of parent communication, an exploratory principal factor analysis (EFA) was performed. The Kaiser–Meyer–Olkin measure ($KMO = 0.92$) indicated that the sample size was sufficient to perform an EFA. Both orthogonal and oblique rotations were examined, and factor solutions were compared for interpretability (Pett et al. 2003). The number of factors extracted was based on the scree test, eigenvalues greater than one, Velicer’s minimum average partial (MAP) test, and interpretability (Costello and Osborne 2005). The final analysis was performed using a Promax rotation with the expectation maximization algorithm used for imputation of missing data.

Following item analysis, we examined the relationships among parent communication and student marijuana attitude, use, and consequences. Preliminary analyses revealed that the marijuana use and consequences variables were not normally distributed. The marijuana use variable contained a large number of zero values (48.2 %), and Vuong’s test indicated that a zero-inflated negative binomial (ZINB) regression was a better fit to the data than a negative binomial model ($V = 5.65, p < 0.001$). ZINB regression simultaneously predicts expected zero values (i.e., abstinence) and counts of frequency of use. Predictors of marijuana consequences were examined among participants who reported marijuana use ($n = 258$). There was evidence of over-dispersion ($\theta = 1.74, SE = 0.19, Z = 9.40, p < 0.001$), and a deviance test supported the use of a negative binomial regression over a Poisson regression, $\chi^2(1) = 28.01, p < 0.001$. Given that for all regression analyses less than 3 % of the data were missing, listwise deletion was used (Greenstein and Davis 2012).

Results

Communication Item Analysis

Overall, 78.5 % of parents had at least one conversation with their student about marijuana. Among those who did discuss marijuana, on average parents discussed 9.53 topics ($SD = 5.90$), and the overall frequency of communication was between one and three times a year ($M = 1.84, SD = 0.90$). Table 1 presents the proportion of students who reported each type of parent marijuana communication. The most common forms of parent communication included parents inquiring about friends’ use of marijuana (53.0 %), asking students about their opinion of marijuana use (50.6 %), discussion of the legal consequences of marijuana

use (42.1 %), and telling the student that they would be disappointed if the student used marijuana (43.2 %).

At an item level, significant differences emerged in the types of communication reported by non-users, light users, and moderate-to-heavy users. For example, in comparison to non-users, heavy users were more likely to report parents talking about the risks of driving under the influence ($Z = 5.12, p < 0.001$), academic problems ($Z = 4.00, p < 0.001$), legal problems ($Z = 3.30, p = 0.001$), rules to obey about using ($Z = 3.60, p < 0.001$), friends' use of marijuana ($Z = 4.73, p < 0.001$), the benefits of marijuana ($Z = 4.85, p < 0.001$), advice on how not to get caught using ($Z = 3.47, p < 0.001$), stories of problems parents experienced because of marijuana ($Z = 3.92, p < 0.001$), and encouraging students to make their own decisions about marijuana use ($Z = 5.40, p < 0.001$). Non-users were less likely than both light and moderate-to-heavy users to report that their parents shared stories about their own marijuana use ($Z = 5.56, p < 0.001$; $Z = 7.28, p < 0.001$, respectively). In comparison to moderate-to-heavy users, non- and light-users were less likely to report that their parents had encouraged them to use marijuana responsibly ($Z = 8.34, p < 0.001$; $Z = 5.13, p < 0.001$, respectively) and given tips on how to use safely ($Z = 6.40, p < 0.001$; $Z = 3.31, p < 0.001$, respectively). Conversations about the students' marijuana use became more common as students' reported more frequent use. For example, more light users reported discussing whether they used marijuana ($Z = 4.96, p < 0.001$) and how often they used marijuana ($Z = 4.57, p < 0.001$) than non-users, while more moderate-to-heavy users reported discussing whether they used marijuana ($Z = 3.50, p < 0.001$) and frequency of use ($Z = 4.87, p < 0.001$) than light users.

Factor Analysis

The factor analysis yielded three factors (Table 1). All of the items had factor loadings greater than 0.32 and were retained in the final measure (Costello and Osborne 2005). Items that crossloaded on two factors were assigned to a subscale based on item content and factor loading strength (Pett et al. 2003). The first factor, risk-related communication (14 items), includes items assessing communication about the health, legal, and relational consequences of marijuana use. The second factor, permissive communication (eight items), reflects parents encouraging marijuana use, giving advice on using marijuana, and talking about their own marijuana use. The final factor, marijuana use-related communication (four items), includes items assessing parents' attempts to find out about marijuana use by their child and their child's friends. Scores on the three factors were weakly-to-moderately positively correlated ($0.29 < r < 0.67$). The three subscales demonstrate excellent reliability ($0.84 < \alpha < 0.94$).

Communication and Marijuana Outcomes

Pearson's correlation coefficients were calculated to examine the relationship between parent-child communication and student attitudes, perceived parent approval, marijuana use, and consequences (Table 2). Greater parent communication about marijuana use and permissive communication was associated with students holding more positive attitudes toward marijuana, perceiving their parents to be more approving, greater use of marijuana, and more negative consequences. Greater parent communication about the risks of

marijuana was not associated with student attitudes, but was associated with perceiving parents to be less approving of marijuana.

Regression Models

The results of the regression models predicting marijuana use and consequences are presented in Table 3. For the ZINB model predicting marijuana use, the logistic results represent the association between each predictor and non-use of marijuana. After controlling for participant sex, the results indicate that risk communication was positively associated with non-use of marijuana ($OR = 1.41, p = 0.04$), while use communication ($OR = 0.45, p < 0.001$) and permissive communication ($OR = 0.46, p = 0.003$) were associated with decreased odds of abstinence. Results of the counts portion revealed that greater permissive communication was associated with more frequent marijuana use ($IRR = 1.26, p = 0.02$). Similarly, among marijuana users, the results of the negative binomial regression predicting negative consequences indicated that only permissive communication was associated with more marijuana-related problems ($IRR = 1.43, p = 0.05$).

In follow-up analyses, we examined the relationships among communication and marijuana use and consequences for a subset of permissive items that focused on harm-reduction content (e.g., encouraging responsible use along with tips on how to use responsibly). The pattern of the results for the two regression models was the same when only the harm-reduction content was included in the permissive subscale.

Discussion

While parents are often encouraged to talk about marijuana with their children (National Institute on Drug Abuse [NIDA], 2014) relatively little is known about parent marijuana communication with college students. The current study aimed to extend past research by exploring the frequency of different types of parent communication messages regarding marijuana and the association between communication and student marijuana attitudes and behavior. A large majority of students reported having spoken with their parents about marijuana in the past 12 months; however, the frequency of communication was fairly low, with conversations typically taking place one to three times a year. The most common type of parent communication was discussions about marijuana risks, including parental disappointment and potential legal problems. A small, but not insignificant minority of students reported that their parents conveyed a variety of permissive messages ranging from being encouraged to make their own decisions about marijuana to being encouraged to try marijuana. The current study highlights the need to assess multiple dimensions of parent marijuana communication.

Among the types of communication assessed, permissive parental communication was most consistently positively associated with student marijuana attitudes and behaviors. Higher levels of permissive communication were related to perceptions of parents as more approving of use, more approving student attitudes, greater odds of non-abstinence, more frequent use, and more negative consequences as a result of using marijuana. This pattern of results remained constant when permissive communication related to harm-reduction (e.g., tips on using responsibly) was examined. These findings are consistent with research

indicating that permissive parental messages, including harm-reduction messages, are associated with more risky alcohol use among college students (Abar et al. 2012; LaBrie et al. 2015). Given the cross-sectional nature of the data, the causal relationship between permissive communication and student outcomes is not clear. It may be that parents who know that their student is using marijuana are providing more permissive messaging in response to their child's behavior. Alternatively, parental permissive communication may encourage students to use marijuana more often, resulting in more frequent marijuana-related problems. Students reporting permissive parental communication may constitute a high risk group that warrants further research.

One of the most common forms of permissive communication was parent disclosures of their own marijuana use and problems parents experienced because of marijuana. Recent research has begun to explore the direct and indirect effects of parent disclosures of substance use on adolescents' substance use attitudes and behaviors (Kam et al. 2015; Kam and Middleton 2013), with some evidence suggesting that parent disclosures may be associated with more approving attitudes and perceived parental approval among younger adolescents (Kam and Middleton 2013). The results of the factor analysis suggest that parent disclosures are related to other permissive messages. It may be that parent disclosures of personal use, even when paired with descriptions of problems experienced by parents, may be interpreted by students as parental approval of substance use and may normalize use. While resources aimed at helping parents talk about marijuana and other drugs with their children recommend that parents who do disclose their own marijuana use provide limited information that focuses on presenting past drug use as a mistake (NIDA, 2014; Partnership for Drug Free Kids 2014), the current results suggest that it may be challenging for parents to disclose use in ways that do not convey approval. Further research is needed to determine whether parents who have used marijuana are more approving of use and whether this helps explain why parent disclosure is associated with other types of permissive communication. Disclosure itself may not be problematic but may be an indicator of parents having greater openness to marijuana use.

Parent communication about marijuana use was associated with increased odds of having used any marijuana in the past year and more permissive student attitudes. These relationships may reflect that parents are more likely to ask students how often they use marijuana when they already suspect or know that their child is using marijuana. More frequent communication about use was also associated with students' viewing their parents as more approving of marijuana use. While finding out whether and how often a child is using marijuana may be a form of specific parental monitoring that is important for open and relevant marijuana discussions, assessing if parents respond to students' disclosures by providing permissive or disapproving messages may be more important for understanding the influence of parent communication.

The risk communication subscale captured parent discussions of a number of potential problems associated with marijuana use as well as items reflecting open communication (e.g., asking students about their opinion and knowledge). In the multivariate models, this type of communication was associated with increased odds of a student remaining abstinent but was not associated with frequency of use or negative consequences. While warning

students about the potential problems related to marijuana use may be protective for those who have not initiated marijuana use, discussing these topics may not be beneficial for those who have already started using. For students who have tried marijuana, parental warnings may be perceived as less credible, particularly for those who used marijuana without experiencing any serious negative consequences. Indeed, while risk communication was associated with parents being perceived as less approving, it was not related to student's own approval. If parents are not perceived as a credible source of marijuana information, parent discussion of risk may not directly influence students' attitudes. It is possible that risk communication has an indirect relationship to student attitudes through perceived parental approval. For example, previous research indicates that when parents are perceived as less approving, students tend to hold less approving attitudes and use marijuana less often (Buckner 2013; LaBrie et al. 2010a; Napper et al. 2015a). Future research is needed to determine whether the perceived credibility of parents' rationale for holding disapproving attitudes moderates the relationship between perceived parental approval and student approval. For instance, perceived parental approval may be less impactful when a parent asserts that marijuana use is not acceptable because it is associated with exaggerated negative outcomes than when parents' concerns are centered on more realistic risks.

Implications and Future Directions

The current findings highlight the diverse range of topics parents and students discuss with regard to marijuana use. Given the prevalence of permissive messaging, prevention efforts that simply encourage parents to have a conversation about marijuana may not be effective for reducing heavy marijuana use among college students. Indeed, among moderate-to-heavy users approximately a third of students reported that their parents had told them to make their own decisions about marijuana use and encouraged responsible use. Prevention efforts may benefit from recognizing the diverse beliefs parents hold regarding marijuana. For example, encouraging parents to express zero-tolerance marijuana messages may be ineffective for parents who have already encouraged their children to try marijuana or have given permissive messages. Research is needed to examine whether parent marijuana attitudes moderate the effects of parent prevention efforts.

While current resources for parents on how to talk about marijuana emphasize the discussion of risks (Partnership for Drug Free Kids 2014), based on the current findings, it is not clear how useful this form of communication is for students who have already initiated use. For these students, other types of parenting behavior such as parental monitoring may be more beneficial for preventing heavy marijuana use (Napper et al. 2015a). Future research is needed to examine how accurate parents' beliefs are with respect to the effects and risks of marijuana use and whether parents and students would benefit from parent-based interventions that educate parents about the effects of marijuana.

One of the most common topics of parent communication was discussions of the legal consequences of marijuana use. As states and local municipalities continue to debate and make changes to the laws and penalties associated with marijuana use (including decriminalizing use), parent conversations about the legal consequences of use may diminish or change in nature. Research from Washington State (Mason et al. 2015) suggests that after the

legalization of recreational marijuana use many parents remained confused over what is and is not legal. Despite this uncertainty, the majority of parents reported having a conversation with their adolescent child about the law. Longitudinal data is needed to see how changes in legalization affect the nature of parent communication and whether parents provide their children with accurate information about marijuana laws.

Limitations

While this exploratory study adds to the literature by describing the frequency of parent–student marijuana communication and associations between different types of communication content and student outcomes, it is not without limitations. First, the cross-sectional design prevents inferences about causal relationships. It is not clear, for example, whether permissive communication leads to students feeling more comfortable trying marijuana and engaging in more frequent use or whether permissive communication more commonly occurs in response to parents becoming aware of their student's use. Longitudinal and experimental designs may help determine the influence of permissive communication both before and after marijuana use initiation. These types of research designs are also needed to help determine which types of parent communication, if any, are effective for reducing the negative consequences of heavy marijuana use and should be the focus of parent-based interventions. Second, the use of a convenience sample at two predominantly White, private universities means it is unclear how generalizable the findings are to college students in general. In addition, only students were asked to report on parent communication. While students self-reports of parenting behavior are more closely associated with student outcomes (Varvil-Weld et al. 2013), examining parents' perspectives on these discussions could help illuminate the role of parent motives for communicating and differentiate reactive and proactive communication.

Furthermore, while the current study highlights the need to explore different types of communication content, further research should clarify what role context, style of communication, parent marijuana knowledge, and perceived credibility have for understanding the influence of parent communication. In the current study, we did not examine who initiated conversations about marijuana and whether the low frequency of communication reflects parents feeling uncomfortable discussing this topic or feeling confident that one or two conversations are sufficient to convey beliefs and expectations regarding marijuana use. Finally, students with more than one parent were asked to report on whether at least one parent had discussed each of the marijuana topics, and we therefore could not explore differences in communication by mothers and fathers. Given the influence of parents may vary as a function of parent and student sex (Luk et al. 2010; Patock-Peckham and Morgan-Lopez 2006), future studies may benefit from examining communication by mothers and fathers separately. Indeed, it is possible that parents may provide conflicting messages about marijuana use that are not captured by more general measures of parent communication.

In sum, the current study extends past research by exploring conversations about marijuana between parents and college students. While research has highlighted the efficacy of parent-based interventions targeting college alcohol use, those considering engaging parents in

efforts to reduce heavy marijuana use on college campuses should recognize that not all parents provide disapproving messages with regard to marijuana use. More research is needed to determine the causal relationships between communication and student outcomes, as well as how content of communication interacts with other parenting factors to either promote or reduce healthy choices regarding marijuana use.

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Table 1

Item factor loadings and responses by user type

Items	% endorsed	% non users	% light users	% moderate-heavy users	Risks and dangers	Permissive talk	MJ use
6. Told me he or she would be disappointed in me if I use marijuana	43.2	40.2	46.9	45.0	0.81	-0.26	0.08
16. Told me about the dangers of being a passenger in a car driven by someone who has been using marijuana	33.1	27.9	33.3	44.1	0.77	0.12	-0.05
2. Talked to me about how to handle offers of marijuana	37.5	34.8	42.2	36.9	0.76	-0.03	0.05
18. Talked to me about how using marijuana can result in negative changes to personality	27.5	25.4	26.5	33.3	0.76	-0.01	0.01
15. Told me about the dangers of driving after using marijuana	31.0	23.0	29.9	50.0	0.74	0.18	-0.03
25. Told me that using marijuana is against their values	34.7	33.3	34.2	38.5	0.72	-0.14	0.09
17. Discussed the risks of marijuana use on academic performance	41.2	32.8	44.9	55.0	0.71	0.03	0.13
23. Asked me what I have heard about the risks of marijuana	28.5	25.6	27.4	36.4	0.71	0.27	-0.18
4. Made a comment about how using marijuana is bad if a character on TV is using or high	35.2	33.3	38.4	35.1	0.70	-0.11	0.01
14. Discussed the legal consequences of marijuana use	42.1	34.8	45.9	53.2	0.70	0.00	0.11
7. Showed me information on the web, TV, or in the news about the dangers of using marijuana	24.2	20.9	25.3	29.7	0.69	-0.09	0.06
3. Gave me rules to obey about using marijuana	33.9	27.5	34.7	46.8	0.63	-0.10	0.27
24. Asked me what I know about the effects marijuana	30.7	28.2	29.5	38.0	0.63	0.27	-0.04
8. Asked about my thoughts and opinion about using marijuana	50.6	44.7	53.7	59.5	0.48	0.16	0.30
27. Encouraged me to use marijuana responsibly	12.3	3.3	9.7	35.8	-0.15	0.73	0.16
28. Talk about the benefits of marijuana use	8.1	3.3	8.2	18.3	0.04	0.71	-0.15
26. Encouraged me to try marijuana	3.6	3.3	3.4	4.6	0.15	0.68	-0.31
29. Told me to make my own decisions about marijuana use	22.4	14.0	23.4	39.4	-0.08	0.66	0.19
21. Told me stories about his or her use of marijuana	26.6	12.0	35.6	46.8	-0.15	0.61	0.23
19. Gave me tips for using marijuana responsibly	14.8	6.6	15.1	32.4	-0.01	0.53	0.43
22. Told me stories about problems he or she experienced because of marijuana	15.1	8.7	19.2	23.9	0.09	0.50	0.06
20. Gave me advice on how not to get caught using marijuana	7.6	4.1	8.2	14.4	0.09	0.39	0.25
10. Asked me how often I use marijuana	21.1	6.6	22.4	51.4	0.05	0.07	0.75
9. Asked me if I am using marijuana	38.7	21.7	45.6	67.3	0.15	0.02	0.74
11. Asked me if my friends are using marijuana	53.0	42.6	57.8	69.4	0.31	0.01	0.58
12. Asked me about the availability of marijuana on campus	34.1	31.3	34.7	39.6	0.33	0.07	0.38

Items	% endorsed	% non users	% light users	% moderate–heavy users	Risks and dangers	Permissive talk	MJ use
Cronbach's alpha					0.94	0.84	0.85
Sum Composite					10.60	1.90	2.88
SD					13.61	3.80	3.84

Factor loadings greater than 0.32 are listed in boldface type

Table 2
Correlations between parent communication and students' attitudes, perceived norms and behavior

Scale	1	2	3	4	5	6
1. Risk communication	–					
2. Permissive communication	0.29***	–				
3. Use communication	0.67***	0.43***	–			
4. Student attitude	0.07	0.33***	0.24***	–		
5. Perceived parent approval	–0.11**	0.48***	0.12**	0.53***	–	
6. Marijuana use	0.18***	0.33***	0.37***	0.67***	0.41***	–
7. Consequences	0.17***	0.23***	0.32***	0.51***	0.31***	0.76***

**
 $p < 0.01$,

 $p < 0.001$

Table 3
Regression analyses predicting marijuana use and consequences from parental communication

Variable entered	Use				Consequences			
	B	SE B	Wald χ^2	Ratio (95 % CIs)	B	SE B	Wald χ^2	Ratio (95 % CIs)
Logistic portion								
Sex	0.46	0.21	4.97*	1.58 (1.06, 2.36)				
Risk communication	0.34	0.15	4.13*	1.41 (1.04, 1.90)				
Permissive communication	−0.77	0.30	8.66**	0.46 (0.03, 0.84)				
Use communication	−0.80	0.20	12.55***	0.45 (0.30, 0.66)				
Counts portion								
Sex	−0.30	0.08	13.97***	0.74 (0.63, 0.87)	−0.76	0.18	17.22***	0.47 (0.33, 0.66)
Risk communication	−0.00	0.06	0.00	1.00 (0.89, 1.12)	0.05	0.14	0.11	1.04 (0.80, 1.37)
Permissive communication	0.23	0.07	5.27*	1.26 (1.09, 1.46)	0.36	0.19	3.84 [†]	1.43 (0.99, 2.06)
Use communication	0.09	0.06	2.02	1.09 (0.97, 1.23)	0.11	0.13	0.72	1.12 (0.86, 1.45)

Ratio = odds ratio for logistic portion and incidence rate ratios for counts portion

† $p = 0.050$,

* $p < 0.05$,

** $p < 0.01$,

*** $p < 0.001$