Published in final edited form as:

Addict Behav. 2012 December ; 37(12): 1342–1348. doi:10.1016/j.addbeh.2012.07.006.

Parent-Child Communication and Marijuana Initiation: Evidence Using Discrete-Time Survival Analysis

James M. Nonnemaker, PhD, Olivia Silber-Ashley, PhD, Matthew C. Farrelly, PhD, and Daniel Dench, BA

RTI International, Research Triangle Park, NC, USA

Abstract

This study supplements existing literature on the relationship between parent-child communication and adolescent drug use by exploring whether parental and/or adolescent recall of specific drug-related conversations differentially impact youth's likelihood of initiating marijuana use. Using discrete-time survival analysis, we estimated the hazard of marijuana initiation using a logit model to obtain an estimate of the relative risk of initiation. Our results suggest that parent-child communication about drug use is either not protective (no effect) or—in the case of youth reports of communication—potentially harmful (leading to increased likelihood of marijuana initiation).

Keywords

marijuana initiation; adolescence; parent-child communication

1. INTRODUCTION

Adolescent drug use continues to be a significant public health concern (Johnston, O'Malley, Bachman, & Schulenberg, 2006; Substance Abuse and Mental Health Services Administration, 2005; U.S. Department of Health and Human Services [USDHHS], 2010). Adolescent drug use predicts a range of social and health problems (Arata, Stafford, & Tims, 2003), including drug use and drug-related problems during adulthood (Ellickson, D'Amico, Collins, & Klein, 2005; Harford, Wechsler, & Muthen, 2003; Mathers, Toumbourou, Catalanom Williams, & Patton, 2006), that account for more deaths and illnesses than any other preventable condition (Wallace et al., 2002). As a result of these consequences, reducing adolescent substance use is a public health goal put forth in *Healthy People 2020* for the United States (USDHHS, 2010). Despite efforts to prevent or reduce marijuana use, marijuana is considered the most used illicit drug in the United States among adults and

© 2012 Elsevier Ltd. All rights reserved.

Corresponding author: Dr. James Nonnemaker RTI International 3040 Cornwallis Road P.O. Box 12194 Research Triangle Park, NC 27709 Voice: (919) 541-7064 Fax: (919) 541-6683 jnonnemaker@rti.org.

Publisher's Disclaimer: This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final citable form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

Contributors:

James M. Nonnemaker contributed to study design, data analysis, and writing of the manuscript.

Olivia Silber-Ashley contributed to study design, data analysis, and writing of the manuscript.

Matthew Farrelly contributed to study design and review of the manuscript.

Daniel Dench contributed to data analysis and writing of the revised manuscript.

Conflict of interest: The authors have no conflict of interest to report.

teenagers (Johnston, O'Malley, Bachman, & Schulenberg, 2010). In 2010, almost half (44%) of 12th graders reported ever having used marijuana and 35% reported marijuana use in the past year. The marijuana use rate is also strikingly high among younger adolescents, with almost 14% of 8th graders and 28% of 10th graders reporting marijuana use in the past year. Trend data from the Monitoring the Future surveys show that these rates have all increased slightly over the past few years (Johnston et al., 2010). Given the slow decline of illicit drug use and the high prevalence of marijuana use (Johnston et al., 2008), it is necessary to develop and implement new prevention methods to combat the youth drug epidemic. One such intervention that has drawn national attention in recent years is parent-child communication about drugs.

Family process theory suggests that open communication patterns encourage adolescents to internalize the values and norms embedded in parents' messages (Whitaker & Miller, 2000). Because family communication is usually a child's first educational environment, it can create patterns of information seeking, interpretation strategies, and expectations that determine much of the course of their maturation and education (Bryant, 1990). It is important to examine parent-child communication about drugs because parents have a profound influence on their children, a large percentage of adolescents experiment with drugs, and adolescent drug use patterns set the stage for adult behaviors.

Several studies of parent-child communication about drugs provide evidence of protection against adolescent drug use (Andrews, Hops, Ary, Tildesley, & Harris, 1993; Kelly, Comello, & Hunn, 2002; Partnership for Drug-Free America, 2003), most likely as a result of increasing adolescents' negative evaluations of behavioral outcomes and normative beliefs (Kelly et al., 2002; Wills, Gibbons, Gerrard, Murry, & Brody, 2003). However, the protective effects of parent-child communication on adolescent drug use may hinge on the delivery, type, and subject matter of the communication. For example, Andrews et al. (1993) found that discussing the harmful health effects of drug use with children and providing instruction not to use drugs (coined "parental cautioning") had a protective effect, whereas discussing punishment and the negative home consequences of drug use increased the odds of drug initiation. Proactive parental family management, including parents' monitoring, rules, discipline, and reward practices, also were found to significantly impact initiation to drug use.

Similar results have been found in studies of adolescent tobacco and alcohol use, providing further support for the connection between parent-child communication and outcomes. Ennett et al. (2001) found parent-child communication regarding rules and discipline to be predictive of escalation of tobacco and alcohol use, whereas Jackson and Henrikson (1997) found parent-child communication about tobacco and alcohol to be protective.

Several interventions incorporating parent-child communication have been shown to reduce adolescent drug use (Chou et al., 1998; Hawkins, Catalano, Kosterman, Abbott, & Hill, 1999; Kosterman, Hawkins, Spoth, Haggerty, & Khu, 1997; Lochman & Wells, 2002; Spoth, Redmond, & Shin, 2001; Spoth, Redmond, Trudeau, & Shin, 2002), whereas others are not so favorable. Hawkins and colleagues (1999) found no impact of parental communication skills training on lifetime marijuana use, whereas Spoth et al. (2001) found that an intervention group receiving simultaneous in-school and parental skills training interventions experienced reduced marijuana initiation rates. However, direct comparison of findings between these studies is complicated by the fact that they use different definitions for parent-child communication.

Conflicting evidence with regard to the impact of parent-child communication on drug initiation and use may be clarified by the use of nationally representative longitudinal data

with both parent and adolescent reports of communication or conversations about drug use. This study will further inform current literature on the relationship between parent-child communication and adolescent drug use by exploring whether parental and/or adolescent recall of specific drug-related conversations differentially impact youth's likelihood of initiating marijuana use. By focusing on initiation, rather than current marijuana use, we can better understand how recall of parent-child conversations affects a youth's decision to first try marijuana.

2. METHODS

2.1 Data

We used data from the National Survey of Parents and Youth (NSPY), a longitudinal household survey designed to evaluate the impact of the National Youth Anti-Drug Media Campaign. A national door-to-door screening methodology identified a sample of adolescents and their parents who were selected to represent adolescents and their parents nationwide. Among eligible households, 74% to 75% completed a household roster of residents and their ages. Within these households, NSPY sampled adolescents from each of three eligible age ranges: 9 to 11, 12 to 13, and 14 to 18. In households with multiple eligible adolescents, up to two adolescents were randomly selected. One biological, foster, adoptive, or step-parent (when the step-parent had been living with the adolescent for at least 6 months) of each sampled adolescent who lived in the same household also completed an interview. When more than one parent or caregiver was present, one was randomly selected, without regard to gender.

The baseline survey for adolescents and parents was conducted between November 1999 and June 2001 and then repeated annually for three subsequent rounds. A total of 8,184 adolescents completed a baseline survey. For each follow-up round, participants were located and eligibility was determined for between 92% and 97% of adolescents and parents. Among adolescents and parents who were still eligible in each follow-up round, the response rate was between 92% and 96%. Other details of the survey design and data collection procedures have been reported elsewhere (Westat, 2006).

2.2 Measures

2.2.1 Initiation to Marijuana Use—Our outcome measure was an event indicator that was set equal to 1 if the respondent reported having ever used marijuana. Unless otherwise noted, the measures are self-reported by the adolescents, and “respondent” refers to the adolescent. Responses by a parent or their partner/co-parent were explicitly identified as parent-reported measures. We defined the age of initiation as the respondent's reported age of first marijuana use. For respondents without a valid age at first use, we used the age at the time of the survey when they first reported using marijuana. By knowing the age at which the respondent first reported ever using marijuana, we can estimate the hazard of initiation to marijuana use at each age for the age range 10 to 18. There was substantial agreement between the reported age of first use and the age at the time of the survey when marijuana use was first reported: 64% agreed exactly, whereas 95% were in agreement within 1 year or less.

2.2.2 Parent-Child Communication Measures—Parents were asked how often they or their partner/co-parent and their child talked about drugs during the past 6 months. The parent questions referred to illicit drugs, defined as marijuana; inhalants; cocaine; heroin; hallucinogens; methamphetamine; or painkillers, tranquilizers, stimulants, sedatives, or barbiturates when they are not prescribed for you. Adolescents were asked how often they and a parent talked about drugs during the past 6 months. The adolescent questions referred

to illicit drugs, defined as marijuana and inhalants. Response options for both parent and youth questions ranged from “never” to “more than 10 times.” This measure of frequency was dichotomized to “never” versus “once or more” to create a dichotomous measure of whether or not the parent (youth) had talked with the youth (parent) about drugs in the past 6 months. Parents who indicated that parent-child communication had occurred at least once were asked about topics they or their partner/co-parent discussed with their child in the past 6 months. Children were asked parallel questions about the content of parent-child communication. We created several measures of topics or content of communication: talked with youth (parents) about family rules about drugs, talked with youth (parents) about consequences of drugs, and talked with parents about drugs (TV and media). The measure of communication about family rules about drugs was created from the following item: “We talked about family rules or expectation about using drugs,” which was coded to 1 if the answer was yes, and 0 if the answer was no. The measure of communication about consequences of drugs was created from two items—“We talked about specific things I (he/she) could do to stay away from drugs,” and “We talked about people your parents (child) or you know who have gotten into trouble with drugs”—and was coded as 1 if either of these was yes, and 0 if both of these was no. Finally, the measure of talking with parents about drugs (TV media) was created from the item “We talked about drug use in movies, music, and on TV,” which was coded to 1 if the answer was yes, and 0 if the answer was no. For each of these measures, if the respondent did not report any communication, then the measure was coded as a 0 for that respondent.

2.2.3 Other Controls—A peer delinquency scale was generated from three variables asking respondents about the number of times in the past 7 days they spent time with peers who engaged in antisocial activities (i.e., friends who “get in trouble a lot,” “fight a lot,” and “take things that don't belong to them”). Eight-point response options ranged from “never” (0) to “seven or more times” (7). Cronbach's alpha for the scale was 0.74, with item-test correlations ranging from 0.58 to 0.73. We dichotomized the scale based on the median average delinquency score (median = 1.33), with average scores less than the median set equal to 0 and 1 otherwise. The sensation-seeking scale included four items tapping youth's inclination toward engaging in novel and risk-taking behaviors (i.e., “like to explore strange places,” “like to do frightening things,” “like new and exciting experiences, even if [they] have to break the rules,” and “prefer friends who are exciting and unpredictable”). The response set for each item included a 5-point agreement scale ranging from “strongly disagree” (1) to “strongly agree” (5). Cronbach's alpha for the scale was 0.76, with item-test correlations ranging from 0.67 to 0.74. We again dichotomized the scale based on the median average sensation-seeking score (median = 2.5), with average scores less than the median set equal to 0 and 1 otherwise. Two separate items measured positive family experiences (i.e., “how often did you enjoy being with parents in the past 30 days,” and “how often did you experience feelings of togetherness in your family in the last 30 days”). One item asked about the frequency of fighting or arguing with parents. Youth indicated how often they fought or argued with their parents in the past 30 days. Response options ranged from “never or almost never” to “always or almost always.” These family measures were dichotomized with responses of “always or almost always” set equal to 1 and 0 otherwise.

To account for potential campaign effects during the study period, we included a measure of exposure to the National Youth Anti-Drug Media Campaign. Westat created a child-specific exposure index, based on the child's recall of the television campaign ads (Westat, 2006). We also controlled for the degree of parental monitoring of the youth using a youth monitoring behavior scale developed by Westat that ranges from 0 to 3 (low to high monitoring).

Social and demographic characteristics assessed by NSPY included adolescent age, adolescent gender, race/ethnicity of the reporting parent, family structure as reported by the parent, total annual household income as reported by the parent, and child's grade point average as reported by the parent. Parents were asked about their education and about their partner/co-parent's education. We coded parent education as the highest level of educational attainment achieved by either parent. We also controlled for whether the adolescent had ever used cigarettes, whether the adolescent had ever been drunk from alcohol, whether the child had been offered marijuana in the past 6 months, the parent's perceived marijuana use by the child, and whether the interviewed parent had ever used marijuana.

2.3 Statistical Analyses

To examine the impact of parental communication about drugs on marijuana initiation, we used discrete-time survival analysis. As noted above, initiation was defined to have occurred when a respondent reported ever having used marijuana. Using this method, we estimated the hazard of marijuana initiation at each age. Discrete-time survival analysis begins with all sample members who have never used marijuana at baseline and then estimates the risk of marijuana initiation as the sample of youth ages. All respondents reporting using marijuana before or at baseline were dropped from the sample to allow for lagging of the parental communication control variables ($n = 1,036$) as reported at wave 1.¹ We also dropped respondents who were missing event data (event = marijuana initiation) in all rounds ($n = 15$) and respondents with only baseline observations ($n = 1,271$), leaving a final analytic sample of 5,864 parent-child pairs. In these models, once the event in question (i.e., marijuana initiation) occurred, the respondent was dropped from subsequent time periods. This allowed us to calculate the probability that an adolescent would initiate marijuana use for each age represented in the sample, given that he or she had not previously used marijuana. We estimated the hazard of marijuana initiation using a logit model that produced an approximate estimate of the relative risk. All analyses were conducted using Stata version 11 (Statacorp, 2009). Additional details on conducting discrete time survival analysis can be found in Allison (1982), Singer and Willett (2003), and Willett and Singer (1993).

Because follow-up waves were conducted annually, we may not have been able to determine the exact order of communication and marijuana use when both measures were reported in the same follow-up wave. To ensure that reported communication measures preceded any reported initiation to marijuana use, we lagged each measure of communication by the previous year such that, for example, the wave 1 reports of communication variables were said to predict the probability of wave 2 initiation. Under similar assumptions, we used lagged measures for all nondemographic control variables. Demographic controls were instead set to baseline values. To account for the fact that multiple children could be selected from each household, we used robust standard errors clustered on households.

We ran two sets of logit models to predict each parent-child communication outcome, resulting in eight sets of results. The second set of models is an extension of the first set but includes risk factors associated with both marijuana initiation and parent-child communication (i.e., binary indicator of ever being offered marijuana, scales for sensation seeking and delinquency, and indicators for current smoking status and alcohol use). The second set of models were specified to account for the possibility that parents may talk to their children about drug use because they think that their children may be at risk of using or may already be experimenting with drugs. For instance, parents who believe that their child

¹Analysis of pre- and post-baseline marijuana initiators show that those initiating at or before baseline are generally younger and from slightly less educated households than those initiating after baseline. There are no other statistically significant demographic differences between these groups (e.g., race/ethnicity, sex, or household income).

has been exposed to marijuana may be more apt to initiate conversation regarding different aspects of drug use compared with parents who believe that their child has no such drug history.

3. RESULTS

Table 1 presents summary statistics for the baseline NSPY sample. On average, adolescents were 11.9 years old at baseline. The majority of parental respondents were non-Hispanic White (64%), non-Hispanic Black (13%), or Hispanic (13%). Approximately two-thirds of respondents lived in a two-parent household. Most adolescents lived in a household in which the highest level of parental education was a high school degree (57%) or greater (25%). About 49% of respondents lived in households with total annual household income less than \$50,000 per year; however, 9% of respondents lacked valid household income. The average age at marijuana initiation was 14.8 years. As shown in Figure 1, the age range of our sample (10 to 18) covered the period over which most initiation occurs.

Overall, a higher percentage of parents reported communication than did adolescents across each of the communication topics (Table 2). We found that 97% of parents reported talking to their children about drugs, whereas only 88% of children reported talking to their parents about drugs, resulting in agreement (e.g., yes-yes and no-no combinations) of parent and child reports in 87% of parent-child pairs. The majority of parents (92%) and children (73%) reported discussing family rules about drugs, resulting in 69% response agreement. Similarly, more parents (93%) than children (80%) reported discussing the consequences of drug use, resulting in 79% response agreement. Seventy-nine percent of parents and 61% of children reported ever discussing drugs in the media, with 52% of parent-child pairs giving similar responses. Overall, children reported ever communicating with their parents less than parents reported ever communicating with their children across all measures of communication.

Youth-Reported Communication Results

Results from the discrete-time survival analysis using robust standard errors clustered by household (Table 3) indicate that two of the four communication measures are positively associated with initiation of marijuana use, suggesting that youth who spoke with a parent about drugs in the past 6 months or about potential consequences of drug use were significantly ($p < 0.05$) more likely to initiate marijuana use (OR = 1.37 and 1.33, respectively). Parent-child communication discussing family rules about drugs was also positive, but this relationship was not statistically significant. Conversations about the presentation of drugs in the media were also associated with increased youth marijuana initiation; however, this relationship was not statistically significant.

When we ran models that included risk factors associated with both marijuana initiation and parent-child communication (Model 2), we found the effect of parent-child communication on marijuana initiation remained significant. In other words, the two outcome measures for youth-reported parental communication remained statistically significant with similar magnitudes when risk factors were included in the model. Parent-child communication about family rules about drugs as well as conversations about the presentation of drugs in the media remained positively associated with marijuana initiation but both were still not statistically significant.

Increases in GPA were associated with decreases in the likelihood of marijuana initiation, and measures of risk (e.g., the delinquency scale, the sensation-seeking scale, smoking cigarettes in the past 30 days, how often they got drunk in the past 12 months, if they were

ever offered marijuana) were significantly associated with increases in the likelihood of marijuana initiation.

Gender, race/ethnicity, parental educational attainment, and household income were generally not significant. Positive family dynamics (e.g., feelings of family togetherness and enjoyment from being with parents), increased parental monitoring of youth, and shared parenting were consistently associated with decreased odds of initiating marijuana use across all types of communication. In contrast, negative family dynamics (e.g., family fighting/arguing), parental beliefs that their child had already used marijuana, and a history of parental marijuana use were significantly associated with increased marijuana initiation across all models and communication topics.

Parent-Reported Communication Results

Table 4 presents results for the effect of parent-reported communication measures on youth marijuana initiation. Similar to the previous youth findings, three of the four communication measures were positively associated with marijuana initiation. Specifically, speaking with children about drugs in the past 6 months, family rules about drugs, or potential consequences of drug use increased a child's odds of marijuana initiation although none of these were statistically significant at the 5% level.

Model 2 included the same measures used when analyzing youth-reported parental communication for prevalence of ever being offered marijuana, scales for sensation seeking and delinquency, indicators for current smoking status and alcohol use, and GPA. The increased odds of marijuana initiation among youth whose parent-reported discussing drugs in the past 6 months and the consequences of drugs were similar to results found in Model 1. However, parental reports of communication regarding family rules about drugs were no longer significant. The effect of communication about drug use in the media remained small and insignificant.

Similar to the youth-reported communication findings, gender, race/ethnicity, parental educational attainment, and household income were generally not significant. Positive family dynamics (e.g., feelings of family togetherness and enjoyment from being with parents), increased parental monitoring of youth, and shared parenting were associated with decreased odds of initiating marijuana. In contrast, negative family dynamics (e.g., family fighting/arguing), parental beliefs that their child had already used marijuana, and a history of parental marijuana use were associated with increased marijuana initiation.

4. DISCUSSION

Our results suggest that parent-child communication about drug use is either not protective (no effect) or—in the case of youth reports of communication—potentially harmful, increasing the likelihood of marijuana initiation. This result is consistent with prior related research. For example, Ennett et al. (2001) found relatively high prevalence and a range of content of parent-child communication about tobacco and alcohol use yet concluded that “the effects of communication on adolescent tobacco and alcohol use were unimportant at best and detrimental at worst” (p.59). In their paper, communication had no effect on initiation of tobacco and alcohol use but had detrimental effects on level of use for those who had already initiated for both tobacco and alcohol. They suggested that adolescents’ reactance or rebelliousness against parental admonishments and rules concerning use of tobacco or alcohol may explain such findings.

Our results also highlight differences between youth and parent reports of communication as well as differences in the effect of communication on marijuana initiation depending on

whether the youth or parent reports the communication. Youth could be underreporting because they do not see the conversation as relevant or necessary (and therefore do not recall it) or because they tune out whatever their parents tell them (which might be a risk factor for initiating). Alternatively, youth who have recently initiated marijuana use might be more likely to recall conversations about marijuana use than youth who have not initiated marijuana use. Parents could be over-reporting because they want to give a socially desirable response (i.e., they think this is what a good parent should be doing). We should point out that there were differences in the questions asked of parents and youth; in particular, parents were given a longer list of examples of illicit drugs that communication could be about. These differences in the question could lead to differences between parent and youth reporting about communication. However, marijuana was mentioned for both parents and youth.

The effectiveness of parent-child communication about drug use may depend on the quality of the parent-child relationship, other aspects of parenting style, or other personal characteristics of the adolescent. These factors may influence the effectiveness of parent-child communication or confound the relationship between parent-child communication and drug use.

We included several measures of the quality of the parent-child relationship to account for the possibility that any effect of parent-child communication about drugs is actually due to a better (worse) parent-child relationship. Although significant, these control variables did not have any effect on the relationship between marijuana initiation and communication measures.

To account for the possibility that parent-child communication was a reaction to a parent's perceived risk of their child's initiation, we included variables measuring other risky behavior of adolescents (e.g., smoking, drinking, delinquency) reported as occurring prior to initiation as well as parents' perceptions of the adolescents' risk of using marijuana. Interestingly, the inclusion of these variables had little impact on the estimates in our models using youth reports of communication. However, inclusion of these variables did have an effect on the relationship between communication and marijuana initiation in some of the models using parent reports of initiation. This suggests that perhaps parents are talking to their children about drug use in response to behaviors they observe in their children that they perceive as likely to be correlated with eventual marijuana initiation. Importantly, this could explain the positive relationship we see between communication and marijuana initiation and would minimize concerns that communication actually causes drug use. However, this was not observed in all models, and we find no evidence that communication prevents marijuana initiation.

The results for the variables measuring youth risk and those related to parenting and the quality of the parent-child relationship were consistent with prior research. Variables measuring other risky behavior of the youth or measures that suggest the youth is at risk for marijuana initiation were associated with a greater hazard of initiation. Indicators of a positive family dynamic (good quality parent-child relationship) or high parental monitoring were protective against the hazard of initiating, and variables indicating a poor family dynamic or parent-child relationship were risk factors for marijuana initiation.

As expected, a measure of a parent having used marijuana was associated with an increased hazard of initiation. However, it is not clear what impact this variable might have on the relationship between communication and youth initiation of marijuana use. Youth may view a parent who has not used marijuana as more credible in communications intended to prevent the youth from initiating marijuana use. In contrast, youth may view a parent who

has used marijuana as a more credible source for information about the risks of using marijuana. These results are again consistent with Ennett et al. (2001).

The results from this study must be viewed within the context of the limitations we encountered. First, we used self-reports of marijuana initiation and communication. Standard practices were used in administering the NSPY to enhance the validity of the self-reports, but the self-reports of marijuana use may still be biased (e.g., underreported). Additionally, the self-reports of communication could be biased; as noted previously, reports from adolescents and their parents do not always agree. In addition, we find some differences in the effects of communication on marijuana initiation by whether the report is from the adolescent or the parent. Neither report is necessarily more valid (Ennett et al., 2001), and both are potentially susceptible to reporting bias.

Second, we do not know anything about the way in which the information was communicated (i.e., the quality of the communication). The communication we report on in this paper reflects the mix of communication that is actually going on between parents and youth—as reported by parents and youth. It is possible that communication interventions that train parents and monitor communication between parents and youth might result in a different quality of communication that might be more effective than the mix of communication that is practiced by parents on their own, as was indicated in Spoth et al. (2001).

Conclusion

Our results add to a paucity of literature suggesting that parent-child communication about marijuana use does not prevent marijuana initiation. Future studies are needed to address issues related to the timing and quality of communication before a definitive conclusion can be reached as to the effectiveness of parent-child communication on adolescent drug use. This study focuses explicitly on initiation and thus does not address the possibility that such communication might have an impact on preventing escalation to further drug use.

Acknowledgments

This study was funded by National Institute on Drug Abuse grant 1 R01 DA020889-01. The authors wish to thank Daniel Shive, Altijani Hussin, Anna MacMonegle, and Daniel Dentch for assistance with analyses for this study. We also thank Susan Murchie for helpful review and editing of the manuscript.

Role of funding sources: This study was funded by National Institute on Drug Abuse grant 1 R01 DA020889-01. The funding source had no role or involvement in this research other than providing the funding.

REFERENCES

- Allison, PD. Discrete-time methods for the analysis of event histories.. In: Leinhardt, S., editor. Sociological methodology. Jossey-Bass; San Francisco, CA: 1982. p. 61-98.doi:10.2307/270718
- Andrews JA, Hops H, Ary D, Tildesley E, Harris J. Parental influence on early adolescent substance use: Specific and nonspecific effects. *The Journal of Early Adolescence*. 1993; 13(3):285–310. doi: 10.1177/0272431693013003004.
- Arata CM, Stafford J, Tims MS. High school drinking and its consequences. *Adolescence*. 2003; 38(151):567–579. [PubMed: 14768998]
- Bryant, J. Television and the American family. Lawrence Erlbaum Associates; Hillsdale, NJ: 1990.
- Chou CA, Montgomery S, Pentz MA, Rohrbach LA, Johnson CA, Flay BR, MacKinnon DP. Effects of a community-based prevention program on decreasing drug use in high-risk adolescents. *American Journal of Public Health*. 1998; 88(6):944–948. doi:10.2105/AJPH.88.6.944. [PubMed: 9618626]

- Ellickson PL, D'Amico EJ, Collins RL, Klein DJ. Marijuana use and later problems: When frequency of recent use explains age of initiation effects (and when it does not). *Substance Use and Misuse*. 2005; 40(3):343–359. doi:10.1081/JA-200049356. [PubMed: 15776981]
- Ennett ST, Bauman KE, Foshee VA, Pemberton M, Hicks KA. Parent-child communication about adolescent tobacco and alcohol use: What do parents say and does it affect youth behavior? *Journal of Marriage and the Family*. 2001; 63(1):48–62. doi:10.1111/j.1741-3737.2001.00048.x.
- Harford TC, Wechsler H, Muthen BO. The impact of current residence and high school drinking on alcohol problems among college students. *Journal of Studies on Alcohol*. 2003; 63(3):271–279. [PubMed: 12086127]
- Hawkins JD, Catalano RF, Kosterman R, Abbott R, Hill KG. Preventing adolescent health-risk behaviors by strengthening protection during childhood. *Archives of Pediatrics and Adolescent Medicine*. 1999; 153(3):226–234. [PubMed: 10086398]
- Hornik R, Maklan D, Cadell D, Barmada CH, Jacobsohn L, Henderson V, Steele D. Evaluation of the national youth anti-drug media campaign: 2003 report of findings executive summary. 2003 Westat Washington, DC Retrieved from <http://www.drugabuse.gov/PDF/DESPR/1203ExSummary.PDF> Report prepared for the National Institute on Drug Abuse (Contract No. N01DA-8-5063).
- Jackson C, Henriksen L. Do as I say: Parent smoking, antismoking socialization, and smoking onset among children. *Addictive Behaviors*. 1997; 22:107–114. doi:10.1016/0306-4603(95)00108-5. [PubMed: 9022876]
- Johnston LD, O'Malley PM, Bachman JG, Schulenberg JE. Monitoring the Future: National results on adolescent drug use. 2006 National Institute on Drug Abuse Bethesda, MD Retrieved from <http://monitoringthefuture.org/pubs/monographs/overview2005.pdf> Overview of key findings, 2005 (NIH Publication No. 06-5882).
- Johnston, LD.; O'Malley, PM.; Bachman, JG.; Schulenberg, JE. Various stimulant drugs show continuing gradual declines among teens in 2008, most illicit drugs hold steady. University of Michigan News Service; Ann Arbor, MI: Dec 11. 2008 from <http://www.monitoringthefuture.org>
- Johnston, LD.; O'Malley, PM.; Bachman, JG.; Schulenberg, JE. Monitoring the Future: National results on adolescent drug use. Overview of key findings, 2010. Institute for Social Research, The University of Michigan; Ann Arbor, MI: 2011. Retrieved from <http://monitoringthefuture.org/pubs/monographs/mtf-overview2010.pdf>
- Kelly KJ, Comello ML, Hunn LC. Parent-child communication, perceived sanctions against drug use, and youth drug involvement. *Adolescence*. 2002; 37(148):775–787. [PubMed: 12564828]
- Kosterman R, Hawkins JD, Spoth R, Haggerty KP, Zhu K. Effects of a preventive parent-training intervention on observed family interactions: Proximal outcomes from preparing for the drug free years. *Journal of Community Psychology*. 1997; 25(4):337–352. doi:10.1002/(SICI)1520-6629(199707)25:4<337::AIDJCOP3>3.0.CO;2-R.
- Lochman JE, Wells KC. The Coping Power Program at the middle-school transition: Universal and indicated prevention effects. *Psychology of Addictive Behaviors*. 2002; 16(4 Suppl):S40–S54. doi:10.1037/0893-164X.16.4S.S40. [PubMed: 12502276]
- Mathers M, Toumbourou JW, Catalano RF, Williams J, Patton GC. Consequences of youth tobacco use: A review of prospective behavioural studies. *Addiction*. 2006; 101(7):948–958. doi:10.1111/j.1360-0443.2006.01438.x. [PubMed: 16771887]
- Partnership for Drug-Free America. Partnership Attitude Tracking Study: Parents 2003. 2003. Retrieved from http://www.drugfree.org/Files/Full_Report_PATS_2003
- Singer, JD.; Willett, JB. Applied longitudinal data analysis. Oxford University Press; London, England: 2003.
- Spoth RL, Redmond C, Shin C. Randomized trial of brief family interventions for general populations: Adolescent substance use outcomes 4 years following baseline. *Journal of Consulting and Clinical Psychology*. 2001; 69(4):627–642. doi:10.1037/0022-006X.69.4.627. [PubMed: 11550729]
- Spoth RL, Redmond C, Trudeau L, Shin C. Longitudinal substance initiation outcomes for a universal preventive intervention combining family and school programs. *Psychology of Addictive Behaviors*. 2002; 16(2):129–134. doi:10.1037//0893-164X.16.2.129. [PubMed: 12079251]
- StataCorp.. Stata Statistical Software: Release 11. StataCorp LP; College Station, TX: 2009.

- Substance Abuse and Mental Health Services Administration. Results from the 2004 National Survey on Drug Use and Health: National findings. 2005 Substance Abuse and Mental Health Services Administration Rockville, MD (NSDUH Series H-28, DHHS Publication No. SMA 05-4062).
- U. S. Department of Health and Human Services (USDHHS), Office of Disease Prevention and Health Promotion. Healthy People 2020. Washington, DC: 2010. from <http://www.healthypeople.gov/2020/topicsobjectives2020/objectiveslist.aspx?topicId=40>
- Wallace JM, Bachman JG, O'Malley PM, Johnston LD, Schulenberg JE, Cooper SM. Tobacco, alcohol, and illicit drug use: Racial and ethnic differences among U.S. high school seniors, 1976–2000. *Public Health Reports*. 2002; 117(Suppl 1):S67–S75. [PubMed: 12435829]
- Westat. Evaluation of the National Youth Anti-Drug Media Campaign: 2004 report of findings. Westat; Rockville, MD: 2006.
- Whitaker DJ, Miller KS. Parent-adolescent discussions about sex and condoms: Impact on peer influences of sexual risk behavior. *Journal of Adolescent Research*. 2000; 15(2):251–273. doi: 10.1177/0743558400152004.
- Willett JB, Singer JD. Investigating onset, cessation, relapse, and recovery: Why you should, and how you can, use discrete-time survival analysis to examine event occurrence. *Journal of Consulting and Clinical Psychology*. 1993; 61:952–965. doi:10.1037//0022-006X.61.6.952. [PubMed: 8113496]
- Wills TA, Gibbons FX, Gerrard M, Murry VM, Brody GH. Family communication and religiosity related to substance use and sexual behavior in early adolescence: A test for pathways through self-control and prototype perceptions. *Psychology of Addictive Behaviors*. 2003; 17(4):312–323. doi:10.1037/0893-164X.17.4.312. [PubMed: 14640827]

Highlights

- Our results highlight differences between youth and parent reports of communication
- In general, communication about drug use is not protective against marijuana initiation
- youth reports suggest communication leads to increased marijuana initiation

Figure 1.
Hazard of Marijuana Initiation

Table 1

Study Sample Demographics at Baseline

Characteristic	Mean	SE
Adolescent age at baseline	11.9	[0.027]
Adolescent age at initiation	14.8	[0.051]

Characteristic	n	%
Adolescent gender		
Male	2962	50.5
Female	2849	48.6
Parent race/ethnicity		
Black, non-Hispanic	788	13.4
Hispanic	743	12.7
White, non-Hispanic	3770	64.3
Other	212	3.6
Missing	351	6.0
Family structure (two-parent household)	3978	68.0
Parents' highest educational level		
4-year college graduate	1468	25.0
High school graduate but no college degree	3326	56.7
Less than high school/dropout	680	11.6
Missing data	390	6.7
Total annual household income		
\$75,000 or more	1252	21.4
\$50,000–\$74,999	1208	20.6
\$25,000–\$49,999	1695	28.9
Less than \$25,000	1157	19.7
Missing data	552	9.4
Total	5,864	100%

Table 2

Parent and Child Reports of Ever Talking about Drug Use by Discussion Topic

report/agreement	Talked About Drugs		Family Rules about Drugs		Consequences of Drugs		Media and Drugs	
	Yes	No	Yes	No	Yes	No	Yes	No
Child report	88.0%	12.0%	73.3%	26.7%	80.4%	19.6%	60.6%	39.4%
Parent report	97.4%	2.6%	92.3%	7.7%	93.5%	6.5%	79.3%	20.7%
% agreement	87.3%		73.3%		79.4%		63.2%	

Table 3
Youth Reported Parent-Child Communication Measures Predicting Youth Marijuana Initiation

Explanatory Variable	Talked About Drugs		Family Rules about Drugs		Consequences of Drugs		Media and Drugs	
	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2
Talked with parent about drugs in past 6 months: lagged	1.37***	1.38***						
Talked with parent about family rules about drugs: lagged			1.14*	1.18*				
Talked with parent about consequences of drugs: lagged					1.33***	1.31***		
Talked with parent about drugs (TV and media): lagged							1.07	1.15
Male	0.89	0.93	0.88*	0.92	0.89	0.93	0.87*	0.91
Race/ethnicity of surveyed parent (ref = white)								
Black	0.84	0.95	0.84	0.94	0.84	0.94	0.84	0.94
Hispanic	1.02	0.88	1.02	0.87	1.01	0.87	1.03	0.87
Other race	0.98	1.02	0.95	0.97	1.01	1.04	0.96	0.99
Highest education of either parent (ref = <high school/dropout)								
High school degree	0.97	1.01	0.96	1.01	0.98	1.04	0.97	1.02
College graduate	0.83	1.00	0.84	1.01	0.86	1.04	0.84	1.02
Household income (ref = <\$25K)								
Income: \$25 and <\$50K	0.93	0.93	0.91	0.91	0.91	0.91	0.91	0.91
Income: \$50 and <\$75K	0.82	0.76*	0.81	0.76*	0.82	0.75*	0.81	0.76*
Income: \$75K	0.81	0.82	0.79	0.82	0.80	0.80	0.80	0.82
Income: missing	0.6	0.78	0.59	0.79	0.60	0.78	0.60	0.79
Family feeling of togetherness: lagged	0.85	0.92	0.85	0.94	0.85	0.93	0.87	0.94
Enjoy being with parents: lagged	0.76***	0.76**	0.76***	0.76**	0.76***	0.76**	0.77***	0.77***
Fight/argue with family: lagged	1.61***	1.18	1.56***	1.16	1.61***	1.17	1.57***	1.15
Youth monitoring behavior scale: lagged	0.65***	0.80***	0.65***	0.80***	0.65***	0.80***	0.65***	0.80***
Youth exposure to ONDCP ads: lagged	0.98	0.94	0.99	0.95	0.98	0.94	0.99	0.95
Other adult sharing parenting	0.69***	0.74***	0.69***	0.75***	0.69***	0.75***	0.69***	0.75***
Parents believe child has used marijuana: lagged	2.18***	1.58	2.08***	1.53	2.14***	1.52	2.18***	1.54

Explanatory Variable	Talked About Drugs		Family Rules about Drugs		Consequences of Drugs		Media and Drugs	
	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2
Sensation seeking scale: lagged		1.68***		1.66***		1.67***		1.66***
Delinquency scale: lagged		1.46***		1.50***		1.47***		1.49***
Smoked cigarettes in past 30 days: lagged		2.69***		2.74***		2.72***		2.73***
How often gotten drunk off alcohol in past 12 months: lagged		2.86***		2.84***		2.87***		2.84***
Ever offered marijuana: lagged		2.03***		2.06***		2.04***		2.09***
Grade point average: lagged		0.97***		0.97***		0.97***		0.97***
Parents ever report using marijuana	1.64***	1.55***	1.66***	1.56***	1.65***	1.56***	1.65***	1.56***
N	13,091	10,717	13,079	10,714	13,034	10,686	13,096	10,724

* p<0.10

** p<0.05

*** p<0.01

Table 4
Parent Reported Parent-Child Communication Measures Predicting Youth Marijuana Initiation

Explanatory Variable	Talked About Drugs		Family Rules about Drugs		Consequences of Drugs		Media and Drugs	
	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2
Talked with child about drugs in past 6 months: lagged	1.11	1.03						
Talked with child about family rules about drugs: lagged			1.20 [*]	1.13				
Talked with child about consequences of drugs: lagged					1.10	1.09		
Talked with child about drugs (TV and media): lagged							0.90	0.91
Male	0.87 [*]	0.92	0.88 [*]	0.92	0.88 [*]	0.92	0.88 [*]	0.92
Race/ethnicity of surveyed parent (ref = white)								
Black	0.84	0.94	0.82	0.92	0.83	0.93	0.84	0.94
Hispanic	1.04	0.89	1.03	0.88	1.04	0.88	1.05	0.89
Other race	0.98	1.01	0.97	1.01	0.98	1.01	0.97	1.01
Highest education of either parent (ref = <high school/dropout)								
High school degree	0.96	1.01	0.95	1.00	0.95	1.00	0.96	1.01
College graduate	0.82	0.99	0.82	0.99	0.82	0.99	0.83	0.99
Household income (ref = <\$25K)					0.91	0.91		
Income: \$25 and <\$50K	0.91	0.91	0.91	0.90			0.9	0.90
Income: \$50 and <\$75K	0.81	0.75 [*]	0.81	0.75 [*]	0.81	0.75 [*]	0.8	0.74 [*]
Income: \$75K	0.81	0.82	0.8	0.81	0.80	0.82	0.79	0.81
Income: missing	0.60	0.78	0.59	0.78	0.60	0.78	0.59	0.77
Family feeling of togetherness: lagged	0.87	0.95	0.86	0.94	0.87	0.95	0.87	0.96
Enjoy being with parents: lagged	0.77 ^{***}	0.77 ^{**}	0.78 ^{**}	0.77 ^{**}	0.77 ^{**}	0.77 ^{**}	0.77 ^{***}	0.77 ^{**}
Fight/argue with family: lagged	1.57 ^{***}	1.15	1.58 ^{***}	1.15	1.58 ^{***}	1.15	1.57 ^{***}	1.15
Youth monitoring behavior scale: lagged	0.65 ^{***}	0.81 ^{***}	0.65 ^{***}	0.81 ^{***}	0.65 ^{***}	0.81 ^{***}	0.65 ^{***}	0.81 ^{***}
Youth exposure to ONDCP ads: lagged	0.99	0.95	0.99	0.94	0.99	0.95	0.99	0.95
Other adult sharing parenting	0.69 ^{***}	0.75 ^{***}	0.69 ^{***}	0.75 ^{***}	0.69 ^{***}	0.75 ^{***}	0.69 ^{***}	0.75 ^{***}
Parents believe child has used marijuana: lagged	2.12 ^{***}	1.51	2.10 ^{***}	1.50	2.11 ^{***}	1.50	2.13 ^{***}	1.51

Explanatory Variable	Talked About Drugs		Family Rules about Drugs		Consequences of Drugs		Media and Drugs	
	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2
Sensation seeking scale: lagged		1.65***		1.64***		1.65***		1.65***
Delinquency scale: lagged		1.50***		1.49***		1.49***		1.50***
Smoked cigarettes in past 30 days: lagged		2.68***		2.67***		2.67***		2.69***
How often gotten drunk off alcohol in past 12 months: lagged		2.89***		2.88***		2.88***		2.89***
Ever offered marijuana: lagged		2.07***		2.08***		2.07***		2.07***
Grade point average: lagged		0.97***		0.97***		0.97***		0.97***
Parents ever report using marijuana	1.65***	1.56***	1.67***	1.57***	1.67***	1.57***	1.66***	1.57***
N	13,196	10,782	13,176	10,766	13,173	10,765	13,175	10,765

* p<0.10

** p<0.05

*** p<0.01