



The power of the proposition: Frequency of marijuana offers, parental knowledge, and adolescent marijuana use



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ABSTRACT

Background: The frequency with which adolescents are offered marijuana has been investigated as a predictor of marijuana use. The current study was designed to test whether the number of marijuana offers received provides an indirect path between parental knowledge and adolescents' marijuana use.

Methods: Data from the nationally representative National Survey of Parents and Youth were examined. Analysis 1 tested the association between frequency of being offered marijuana and adolescents' ($N=4264$) marijuana usage in the subsequent year. Analysis 2, spanning a three-year time frame, tested whether the frequency of marijuana offers at the second year of the panel study bridged the relationship between parental knowledge in Year 1 and marijuana use in Year 3.

Results: Analysis 1 indicated that the frequency with which adolescents were offered marijuana predicted usage one year later, after controlling for previous usage and nine other common predictors of marijuana use. Analysis 2 revealed an indirect relationship between parental knowledge and use through the number of marijuana offers the adolescent received.

Conclusion: There was a strong link between the number of offers received and adolescents' future marijuana use. Higher parental knowledge predicted reductions in offer frequency, which was associated with lower levels of marijuana use. Reducing the number of marijuana offers an adolescent receives could serve as a useful focus for intervention programs targeting parents.

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1. Introduction

Marijuana use is associated with many undesirable outcomes, including inferior academic achievement (Bryant et al., 2003), risky sexual behavior (Bryan et al., 2012), increased tobacco and alcohol use (Siegel et al., 2013), and greater vulnerability to addictive behaviors (Hurd et al., 2014). Adolescent usage is particularly detrimental as it affects neurocognitive development, with younger users at proportionally greater risk of harm (Gruber et al., 2012). Predictors of marijuana use that traditionally garner attention include parental knowledge (Lac and Crano, 2009), sensation seeking (Eisenman et al., 1980), and peer norms (Elliott and Carey, 2012; Pedersen et al., 2013). The effect of the frequency with which adolescents are offered marijuana has received less attention, and is the focus of the current research.

1.1. Being offered marijuana as a predictor of use

Wagner and Anthony (2002) credit Frost (1927) with introducing the concept of exposure opportunity. Opportunity is crucial because "Being presented with an opportunity to use drugs is the first step of drug involvement . . . drug use is only possible given exposure to drug use opportunities" (Benjet et al., 2007, p. 128). Beyond opportunity (i.e., being around others who are using a drug), being offered marijuana amplifies drug use cues (Wertz and Sayette, 2001). Thus, adolescents predisposed to risky behavior may be more likely to act on their predilection when an offer is made (Voelkl and Frone, 2000), and even those who may never have considered marijuana use might otherwise accede, if offered.

In support of the importance of whether adolescents receive offers to use marijuana in relation to future use, Ellickson et al.'s (2004) 30 school study indicated that merely being offered marijuana predicted current use, and use one year later. In research on secondary school students, Manning et al. (2001) reported that 65.9% of users reported using marijuana as a result of an offer. Grady et al. (1986) found that 58% of 8th graders from two New England towns reported being offered marijuana, and approximately 65% accepted the offer.

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1.2. Parental knowledge, offering, and marijuana use

Greater parental knowledge (i.e., awareness of the child's activities; [Stattin and Kerr, 2000](#)) is a commonly noted protective factor in research on adolescent marijuana use ([Lac and Crano, 2009](#)). Even though peers are highly influential in adolescence, parents still hold major sway over their children's decisions, including those involving drug use ([Blake et al., 2001](#); [Fletcher et al., 1998](#); [Krosnick and Judd, 1982](#); [Lamb and Crano, 2014](#); [Li et al., 2002](#)). In addition to highlighting the utility of investigating the number of marijuana offers adolescents receive, the current study assesses whether being offered marijuana provides an indirect path between parental knowledge and later marijuana use. If the number of times an adolescent is offered marijuana provides an indirect path between parental knowledge and marijuana use, the utility of the construct of marijuana offers will not only be highlighted, it also will offer a potential approach for future prevention efforts. Working with parents to minimize the likelihood that their children will be in situations in which marijuana is likely to be offered, for example, may prove an effective prevention strategy.

Previous studies offer reason to suspect that frequency of marijuana offers indeed provides an indirect path from parental knowledge to marijuana use. An association between parental knowledge and substance use has been identified ([Lac and Crano, 2009](#)). Not every longitudinal study supports a direct relationship between parental knowledge and use ([Tebes et al., 2011](#)), but such a relationship has been indicated ([Abar et al., 2014](#)) and indirect effects have been reported by [Cleveland et al. \(2005\)](#), who found an effect of parental knowledge and reduced substance use through reduced susceptibility. Further, although focused on parental monitoring (i.e., parental tracking and surveillance) rather than the more global construct of knowledge (i.e., awareness of the child's activities; e.g., [Crouter and Head, 2002](#); [Stattin and Kerr, 2000](#)), [Pinchevsky et al. \(2012\)](#) reported a negative relationship between parental monitoring in high school and marijuana offers when students attended university (also see [Chen et al., 2005](#)). Further, as noted, a relationship between offers received and marijuana use was reported by [Ellickson et al. \(2004\)](#). However, whether the number of offers an adolescent receives provides an indirect path from knowledge to use is relatively untested. If being offered marijuana is a mediator of the relationship between parental knowledge and marijuana use, it will highlight the "power of the proposition" (i.e., the importance of being offered marijuana as a predictive variable), and provide insight into future prevention programs.

1.3. The current study

Using a nationally representative sample of adolescents, the first goal of the present research is to examine the lagged associations between the number of marijuana offers received and adolescent marijuana use, and to compare this relationship with those involving more common predictors (e.g., tobacco and alcohol use, refusal skills, and delinquency). Although frequency of offers has been associated with current and future marijuana use, study samples have been relatively small or constrained geographically. Further, the predictive association of offers with marijuana use has only occasionally been inspected over and above other common predictors of use, such as alcohol and tobacco use, family communication, and academic achievement (e.g., [Ellickson et al., 2004](#)). As a second appraisal of the importance of the frequency with which an adolescent is offered marijuana, and to explore a potential path for parent-based prevention efforts, we also determine whether being offered marijuana provides an indirect path between parental knowledge and marijuana use.

2. Methods

2.1. Respondents and sampling procedure

Data from a nationally representative sample of 9–18-year olds in the United States ($N=8117$) were used. The survey was conducted in conjunction with the National Youth Anti-Drug Media Campaign, a social intervention that used nearly all known mass-media to persuade adolescents to avoid illicit substances ([Hornik et al., 2003](#)). Respondents were randomly selected from 81,000 households within 90 geographic areas (90 of 100 Primary Sampling Units; see [National Institute on Drug Abuse, 2006](#), for a detailed description of the sample, instrument, and the data collection procedures). The overall cross-sectional response rate for all youth (ages 9–18) at each round, defined as the product of: (a) the percent of sampled households that were eligible, (b) the eligible households that completed the screening roster, (c) eligible households selected for follow-up, and (d) completion rate of youth in the round, was 64% in round 1. Follow-up response rates for eligible participants were 86.3%, 92.3%, and 93% in rounds 2, 3, and 4, respectively.

2.2. Respondents and interview procedure

At respondents' households, interviewers obtained non-sensitive data (e.g., demographic information) via a computer-assisted personal interview; audio-computer-assisted self-interviewing was used for sensitive data such as drug-relevant perceptions and behaviors. From November 1999 to June 2003, four interviews were administered in respondents' homes at approximately yearly intervals. For present purposes, to minimize respondent loss only the first three rounds of data are used (respondents aged-out of the study at 19 years of age). Children between the ages of 9–11 answered abbreviated surveys and were excluded from the analyses.

For Analysis 1, 4264 respondents who participated in the Year 1 (Y1) and Year 2 (Y2) interviews were used. Analysis 2 used individuals who participated in Years 1–3 ($N=3540$). The sample dropped from 8117 to 4264 primarily due to the removal of the 9–11-year old participants. In Y1, 36.8% ($n=2985$) were 9–11. Using a maximum likelihood estimator that accounts for missing data, attrition rates were 16.96% ($n=871$) from Y1 to Y2, and 16.98% ($n=724$) from Y2 to Year 3 (Y3). A large portion of these dropouts were due to aging out ($n=333$ in Y2, $n=359$ in Y3), as only those 18 or younger were eligible to participate. Of the base sample from Y1, approximately half was male (51.4%). The mean age at the first measurement point was 14.83 ($SD=1.91$) years, and grew by approximately one year as the survey progressed. Racial/ethnic makeup of the sample was as follows: 66.6% White, 14.8% African-American; 14.6% Latino; and 4.0% other. All participants were exposed to the media campaign either through mass media channels, or during data collection that included exposing adolescents to anti-drug advertisements and asking for an evaluation of the messages.

2.3. Measures

In developing predictive models, many variables commonly associated with marijuana use were included in addition to offers. These include gender ([Voelkl and Frone, 2000](#)), age and delinquency ([Treno et al., 2008](#)), tobacco use ([Smart, 1977](#)), alcohol use ([Siegel et al., 2013](#)), parental knowledge ([Abar et al., 2014](#)), academic performance ([Bergen et al., 2005](#); [Cox et al., 2007](#)), sensation seeking ([Eisenman et al., 1980](#); [Palmgreen et al., 2001](#)), and refusal strength (e.g., [Botvin, 2000](#)).

2.3.1. Offers. Being offered marijuana was measured by a single item: "How many times in the last 30 days have you been offered marijuana?" Responses could range from 1 (*never*) to 5 (*5 or more times*).

2.3.2. Demographics. Age and gender were recorded for use as covariates.

2.3.3. Marijuana use. A single score of marijuana use was compiled from three items. All respondents were asked, "Have you ever, even once, smoked marijuana?" Those responding "no" were given a score of 0; those responding "yes" were asked, "How long has it been since you last used marijuana?" Those responding "More than 12 months ago" were given a score of 0; those responding "during the last 30 days" or "More than 30 days ago but within the last 12 months" were asked, "During the last 12 months, how many times have you used marijuana?" Answers were scored as follows: 1 (1–2 times), 2 (3–5 times), 3 (6–9 times), 4 (10–19 times), 5 (20–39 times), or 6 (40 or more times).

2.3.4. Academic performance. Academic performance was measured by a single item: "Which of the following best describes your average grade in school?" This single item measure was on a scale from 1 (*D {69 or below}*) to 9 (*A {93–100}*).

2.3.5. Parental knowledge ($\alpha=0.75$, $r=0.60$). Parental knowledge was measured by the following two items: "In general, how often does at least one of your {parents/caregivers}:" "Know what you are doing when you are away from home?" and "Have a pretty good feeling of your plans for the upcoming day?" For both questions, the response options ranged from 1 (*never or almost never*) to 5 (*always or almost always*).

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