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Marijuana Use, Driving, and Related Cognitions

Brooke J. Arterberry,
Department of Educational, School, and Counseling Psychology, University of Missouri

Hayley R. Treloar,
Department of Psychological Sciences, University of Missouri

Ashley E. Smith,
Department of Educational, School, and Counseling Psychology, University of Missouri

Matthew P. Martens,
Department of Educational, School, and Counseling Psychology, University of Missouri

Sarah Pedersen, and
Psychiatry Department, University of Pittsburg

Denis M. McCarthy
Department of Psychological Sciences, University of Missouri

Abstract

Objective—The purpose of the present study was to examine cognitive risk factors for driving after use of marijuana. We tested whether marijuana outcome expectancies and specific cognitions about driving after marijuana use were uniquely associated with the likelihood and frequency of driving while high (DWH) and riding with a high driver (RWHD).

Method—Participants were college students recruited from introductory psychology classes at a Midwestern university who reported ever using marijuana in their lifetime and reported having access to a car or driving at least once a month (n = 506).

Results—Greater perceived dangerousness of DWH was associated with decreased likelihood of DWH and RWHD. Negative marijuana expectancies were associated with decreased likelihood of DWH, and social norms were associated with decreased likelihood of RWHD. All cognitive predictors were associated with decreased frequency of DWH and RWHD for individuals with the propensity to engage in these behaviors.

Conclusions—Findings suggest interventions to reduce risk of DWH and RWHD may benefit from targeting general expectancies about the negative effects of marijuana. Similarly, results suggest increasing students' knowledge of the potential danger of DWH may help to reduce the likelihood of and frequency of DWH and RWHD.

Habitual marijuana use increases the likelihood of an injury-related traffic accident, even after controlling for blood alcohol concentration (Blows et al., 2004). According to the National Institute on Drug Abuse (2010), 6.8% of drivers under the age of 35 experience accidents while driving under the influence of marijuana. Those driving under the influence of marijuana have impaired psychomotor functioning such as increased delay in response to road obstacles, and impaired driving performance (Liguori, Gatto, & Robinson, 1998; Ramaekers, Berghaus, van Laar, & Drummer, 2004). However, many young adults deny that smoking marijuana before driving affects driving ability (Darke, Kelly, & Ross, 2004;

Correspondence concerning this article should be addressed to Denis McCarthy; Department of Psychological Sciences, 210 McAlester Hall, University of Missouri, Columbia, MO; (573) 882-0426; mccarthydm@missouri.edu.

Lenné, Fry, Dietze, & Rumbold, 2001; Terry & Wright, 2005). Despite the risks of driving under the influence of marijuana, it is the most prevalent illicit drug detected in impaired drivers (Drummer et al., 2003; Li et al., 2011).

Marijuana is the most used illicit drug and is perceived as the least risky illicit drug among college students (Gaher & Simons, 2007; Johnston, O'Mally, Bachman, & Schulenberg, 2010). Approximately 47% of college students have smoked marijuana in their lifetime, 18% have smoked marijuana in the past 30 days, and 4.4% smoke marijuana daily (Johnston et al., 2010). Because of these high prevalence rates and the negative consequences resulting from use (e.g., concentration problems, missing class, and driving high: Caldeira, Arria, O'Grady, Vincent, & Wish; 2008; Chabrol, Duconge, Casas, Roura, & Carey, 2005; Simons, Correia, Carey, & Borsari, 1998), marijuana use among the college population is a significant concern.

Currently, little research exists regarding factors that influence the risk of driving after marijuana use or riding with a high driver among college students who use marijuana. Cognitive factors such as attitudes and expectancies are a particularly important area of research, in that they are malleable and therefore potential foci of intervention strategies (McCarthy, Pedersen, & Leuty, 2005). Although considerable research has focused on the potential impact of cognitive factors on marijuana use in general (Hayaki et al., 2010; Linkovich-Kye & Dunn, 2001; Neighbors, Geisner, & Lee, 2008; Simons, Neal, & Gaher, 2006) and driving after drinking alcohol (Grube & Voas, 1996; Turrisis, Jaccard, & McDonnell, 1996), little is known about risk factors and perceptions of driving while high (McCarthy, Lynch, & Pedersen, 2007). Attitudes about using marijuana in general, such as perceived dangerousness of use, perceived negative consequences of use, and social norms can contribute to marijuana use and marijuana-related problems (Darke et al., 2004; Schafer & Brown, 1991; Simons & Arens, 2007; Simons et al., 2006; Vangsness, Bry, & LaBouvie, 2005). Furthermore, positive expectancies regarding the effects of marijuana are associated with higher rates of marijuana use (Hyaki et al., 2010; Linkovich-Kye & Dunn, 2001; Simons & Arens, 2007; Schafer & Brown, 1991; Vangsness et al., 2005).

It is important to identify possible attitudes and expectancies associated with driving after marijuana use, as many young adults deny that marijuana use adversely affects driving ability, and some believe marijuana actually improves driving performance by heightening awareness and concentration (Darke et al., 2004; Lenné et al., 2001; Terry & Wright, 2005). Although there is some evidence to suggest those who drive high compensate for their impairment by driving more conservatively, this overcompensation is not sufficient to counteract the impairing effects of marijuana (Ramaekers et al., 2004). Research on attitudes of those who drive under the influence of marijuana indicates that individuals do not perceive driving high as risky for themselves or others (Jones, Swift, & Weatherburn, 2007; McCarthy et al., 2007; Swift, Jones, Donnelly, 2010), and college students who perceive driving after marijuana use as less dangerous (McCarthy et al., 2007) are more likely to drive while high. Existing studies have also shown that young adults who drive after marijuana use believe they are less likely to experience negative consequences, such as having an accident or being caught by the police (Darke et al., 2004; McCarthy et al., 2007). Furthermore, normative beliefs, defined either as perceived peer behavior or peer acceptance of a particular behavior, also contribute to marijuana use, problems, and driving after use (Simons et al., 2006; McCarthy et al., 2007).

These discrepant beliefs may not be simply a function of excessive marijuana use, but a reflection of the decriminalization of medical marijuana (Hoffman & Webber, 2010) and the difficulty of legal enforcement of driving while high. Over the past 30 years, a significant reduction in drinking and driving behavior and alcohol-related fatal accidents has occurred.

This reduction is due in part to the creation of an alcohol per se standard (Giesbrecht & Greenfield, 2003) and the development of policy interventions to change beliefs regarding the risks of drinking and driving (Greenberg, Morral, & Jain, 2004). However, similar policies for driving while high are limited by both the feasibility of drug testing technology and the complexity of the relationship between blood levels of cannabinoids and impairment (DuPont, Logan, Shea, Talpins, & Voas, 2011). Lack of a clear legal standard and difficulty in enforcement may influence young adults' perceptions of the likelihood of negative consequences of driving while high.

While previous studies have demonstrated the influence of social norms and attitudes on risk for driving while high, the role of marijuana outcome expectancies in the decision to drive while high has not been examined. Expectancy theory provides a social learning basis from which to examine motivations for substance use. Expectancies encompass the positive and negative beliefs that affect quantity and frequency of substance use (Jones, Corbin, & Fromme, 2001). For marijuana expectancies, research has identified expectancy domains, such as cognitive and behavioral impairment, relaxation and tension reduction, social and sexual facilitation, perceptual and cognitive enhancement, global negative effects, and craving and physical effects (Schafer & Brown, 1991). Considerable research suggests that positive expectancies regarding marijuana are associated with higher rates of marijuana use, problem severity, and dependence (Hayaki et al., 2010; Linkovich-Kye & Dunn, 2001; Simons & Arens, 2007; Schafer & Brown, 1991; Vangsness et al., 2005), but less is known about the potential protective influence of negative marijuana expectancies. Understanding the unique contribution of expectancies about the effects of marijuana, generally, and attitudes toward driving after marijuana use, specifically, will help to develop a better model of the cognitive factors that influence the decision to drive under the influence of marijuana, and provide a framework for identifying those who are more or less apt to smoke marijuana and drive.

In the current study, we examined the unique associations of positive and negative expectancies about marijuana's effects and specific attitudes toward driving after marijuana use with driving while high (DWH) and riding with a high driver (RWHD). We hypothesized that more positive expectancies about the effects of marijuana would be associated with a greater likelihood of DWH and RWHD. Conversely, we hypothesized that more negative expectancies about the effects of marijuana would be associated with a decreased likelihood of engagement in these behaviors. We hypothesized that more negative attitudes toward the specific behaviors of DWH and RWHD would protect against these behaviors. Finally, we tested whether marijuana expectancies in general and specific driving related cognitions each made unique contributions to engagement in marijuana-related driving behavior.

Method

Participants and Procedure

Participants were college students recruited from introductory psychology classes at a Midwestern university who reported ever using marijuana in their lifetime ($N = 597$). Analyses were restricted to a subsample that either reported having access to a car or driving at least once a month ($n = 506$, 84.8%). The majority of the sample was Caucasian (91.1%), with other ethnicities as follows, 4.0% African American, 3.3% Hispanic, 1.6% Asian, and 3.4% mixed or other race. Participants were primarily college freshmen (78.1%; $M = 18.3$ years of age, $SD = 1.1$), and 48.9% were female. Participants completed a paper-and-pencil questionnaire packet in groups of 20–30 students. Partial course credit toward meeting a research requirement for their psychology class was offered for participating. The university Institutional Review Board approved these procedures.

Measures

Demographic information—Relevant demographic information was collected, including age, gender, race, ethnicity, and year in school. Participants also indicated whether or not they currently had access to a car and whether they drove at least once in the past month.

Marijuana use—As in previous research (McCarthy et al., 2007), marijuana use questions were adapted from the Drinking Styles Questionnaires (Smith et al., 1995). This measure has demonstrated good reliability and validity in similar college samples (McCarthy et al., 2001; Smith et al., 1995). Marijuana user/nonuser status, past year, and past month frequency of use were assessed. There were 7 past year forced choice response options that ranged from "not at all" to "more than 100 times," and options for past month frequency ranged from "not at all" to "multiple times a day."

Driving while high and riding with a high driver—Driving while high was assessed with a single item asking participants to indicate the number of times they had driven within 2 hours of smoking marijuana in the past three months (McCarthy et al., 2007). A similar question asked participants to indicate the number of times in the past three months they had ridden with a driver who they knew had been smoking marijuana.

Marijuana expectancies—Marijuana expectancies were assessed with the Marijuana Effect Expectancy Questionnaire—Short Form (MEEQ: Aarons, Brown, Stice, & Coe, 2001). The MEEQ measures positive and negative marijuana effect expectancies across six domains: Cognitive and Behavioral Impairment (10 items), Relaxation and Tension Reduction (8 items), Social and Sexual Facilitation (9 items), Perceptual and Cognitive Enhancement (8 items), Global Negative Effects (9 items), and Craving and Physical Effects (6 items). Participants were instructed to respond to questions according to their own personal thoughts, feelings, and beliefs about marijuana now. This version of the original MEEQ (Shafer & Brown, 1991) asks participants to indicate the degree to which they agreed with each expectancy item on 5-point Likert scales ranging from "disagree strongly" to "agree strongly" rather than using true/false response options. Mean composite scores were calculated for each subscale. In the current sample, internal consistency estimates (Cronbach's α) for these subscales ranged from .76 to .87.

Driving Cognitions—Questions assessing cognitions about DWH were adapted from prior studies assessing drinking and driving (Grube & Voas, 1996; McCarthy et al., 2006; McCarthy et al., 2005) and have been used in previous research (McCarthy et al., 2007). Three domains of DWH cognitions were assessed. *Injunctive social norms* were assessed by two questions asking participants to indicate how many (0–3) of their three closest friends would disapprove of DWH and how many would refuse to RWHD. *Perceived dangerousness* of DWH was assessed with a single item asking participants to indicate how dangerous they believed it was to drive within 2 hours after smoking marijuana on a 4-point Likert scale ranging from "not at all dangerous" to "very dangerous." *Perceived negative consequences* were assessed with four questions asking participants to indicate how likely they believe a driver their age would experience specific consequences from driving during or after marijuana use. Participants indicated their perceived likelihood of being stopped by the police, being drug tested, being arrested, and having an accident on 4-point Likert scales ranging from "not very likely" to "very likely."

Analytic Strategy

In order to account for the significant number of smokers who did not report DWH or RWHD, zero-inflated Poisson (ZIP) regression models were estimated with Mplus Version 6.12 (Muthén & Muthén, 2011). ZIP models are appropriate when the dependent variable is

a frequency count of a behavior with a high proportion of zero cases. Dependent variables were counts of the number of times smokers had driven within two hours of smoking marijuana (DWH) and the number of times smokers had ridden with a driver they knew had been smoking marijuana (RWHD) in the past three months. ZIP models are particularly useful for predicting low base rate behaviors as they allow for two types of prediction: (a) engagement in the behavior and (b) frequency of the behavior for those able to assume values other than zero.

Mplus estimates two components for the ZIP model. The first is a zero-inflation component similar to an odds ratio from a logistic regression model. The likelihood of being in the zero class, or of *not* engaging in the behavior, is calculated for each predictor. For ease of reporting, odds ratios were inverted where higher values indicated the likelihood of being in the non-zero class, or the odds of engaging in the behavior. The second component estimates the association between the predictor variables and the frequency count of the behavior for those able to assume non-zero values, yielding a Poisson regression coefficient.

Results

Descriptive Statistics

The majority of the sample (78.4%) reported using marijuana in the past year, and 63.7% indicated use in the past month. Of those who used marijuana in the past month, 27.5% reported smoking once a month, 15.3% reported smoking every other week, 15.6% smoked every week, 29.1% smoked 2–3 times per week, 8.1% smoked daily, and 4.4% reported smoking multiple times per day. In the full sample, 35.4% of smokers reported driving within two hours of smoking marijuana (DWH) in the past three months. Approximately one third (37.9 %) of these reported DWH only once or twice, one third (32.8%) reported 3–10 instances of DWH, 17.2% reported 11–30 instances of DWH, 8.1% reported 31–60 instances, and 4% reported DWH 60+ times in the past three months. With regard to RWHD, approximately two-thirds (64.4%) of the sample reported RWHD at least once in the past three months, where 31.1% reported RWHD once or twice, 40% reported 3–10 instances of RWHD, 13.7% reported 11–30 instances of RWHD, 11.4% reported 31–60 instances, and 3.8% reported RWHD 60+ times in the past three months.

Effect of Negative Marijuana Expectancies on DWH and RWHD

An important preliminary step was to test which marijuana expectancy subscales were most strongly associated with DWH and RWHD. Table 1 presents results from ZIP analyses predicting DWH and RWHD from all six marijuana expectancy subscales, gender, and past-month frequency of marijuana use. Of the six marijuana expectancy subscales, global negative marijuana effects expectancies were the most consistent predictor of DWH and RWHD. After controlling for gender, marijuana use frequency, and other marijuana expectancies, stronger global negative effects expectancies were associated with decreased likelihood of engagement in DWH and RWHD behaviors (DWH: OR = .47, p <.001, 95% CI [.31, .71]; RWHD: OR = .64, p = .017, 95% CI [.45, .93]). Negative expectancies were also associated with decreased frequency of DWH and RWHD over and above other expectancy subtypes and covariates (DWH: $\beta = -.21$, $p < .001$; RWHD: $\beta = -.23$, $p < .001$). Of the remaining marijuana expectancy subscales, none were significantly associated with engagement in DWH or RWHD behaviors.

For marijuana smokers who did engage in these behaviors, other expectancies subscales were also associated with the frequency of DWH and RWHD. Social and sexual facilitation expectancies were associated with increased frequency of DWH and cognitive and behavioral impairment expectancies were associated with decreased frequency of DWH.

Perceptual and cognitive enhancement expectancies and craving and physical effects expectancies were significantly associated with increased RWHD; however, social and sexual facilitation expectancies as well as cognitive behavioral impairment expectancies were associated with decreased RWHD. Furthermore, relaxation and tension reduction expectancies were not significantly associated with either DWH or RWHD. Given the superior nature of the global negative effects subscale over and above the marijuana expectancy types, this subscale was used as a general measure of negative marijuana expectancies to be compared to driving-specific cognitions in subsequent analyses.

Effect of Marijuana Expectancies and Driving Cognitions on DWH and RWHD

Table 2 presents results of correlational analyses predicting the frequency of DWH and RWHD in the past three months. Stronger negative marijuana expectancies, greater peer acceptance, and increased perceptions of danger and negative consequences were all associated with lower levels of DWH and RWHD among smokers who engage in these behaviors, *r*s = −.22 to −.40, *p*s < .001. Marijuana use was strongly associated with increased DWH and RWHD, *r*s = .50, .52, *p*s < .001. Gender was not significantly associated with DWH or RWHD.

Table 3 presents results of multivariate ZIP models predicting DWH and RWHD from negative marijuana expectancies, perceived danger, perceived negative consequences, and social norms, with gender and past month marijuana use as covariates. After controlling for marijuana use, gender and other cognitive predictors, greater perceived dangerousness of DWH was associated with decreased odds of engaging in DWH and RWHD (DWH: OR = .55, p = .002, 95% CI [.38, .80]; RWHD: OR = .69, p = .022, 95% CI [.50, .95]). Also over and above covariates and other predictors, negative marijuana expectancies were associated with decreased likelihood of DWH, OR = .58, p = .009, 95% CI [.38, .87], but not associated with odds of RWHD, p = .847. In contrast, social norms were associated with decreased likelihood of RWHD, OR = .65, p =.001, 95% CI [.51, .83], but were not associated with odds of DWH, p = .30. Perceived negative consequences were not significantly associated with the likelihood of either DWH or RWHD. All cognitive predictors were protective against increased frequency of DWH and RWHD for individuals with the propensity to engage in these behaviors.

Discussion

The purpose of this study was to examine cognitive factors associated with risk for driving after using marijuana and riding with a high driver. Although driving ability is adversely affected by marijuana use, college students often drive while high or ride with high drivers. Due to the risk involved, it is important to identify factors that may protect against DWH and RWHD among those students who use marijuana. Our results suggest that users with stronger negative marijuana outcome expectancies and those who perceive DWH as more dangerous are less likely to DWH. Similarly, those who perceived their peers as more disapproving of DWH may also be less likely to RWHD. In contrast, users' beliefs about the likelihood of negative consequences of DWH may have little impact on this behavior. These findings suggest that increasing student marijuana users' knowledge of the potential danger of DWH may help to reduce the likelihood and frequency of DWH and RWHD. In addition, intervention efforts may benefit from targeting marijuana outcome expectancies and perceived norms.

One goal of this study was to provide a preliminary understanding of the unique association of positive and negative marijuana expectancies with DWH and RWHD. For students who engaged in DWH and RWHD, negative marijuana expectancies were associated with reduced frequency of these behaviors over and above other marijuana expectancies and

marijuana-related driving cognitions. Our results indicated that among marijuana users, global expectancies about the negative effects of marijuana (e.g., marijuana causes me to lose control or be careless) may act as a protective factor against DWH and RWHD. In contrast, positive marijuana expectancies (e.g., marijuana increases relaxation in social situations, marijuana makes me more creative) were associated with increased frequency of DWH or RWHD for those who engage in these behaviors. By identifying the role of both positive and negative expectancies, clinicians and researchers can target risk and protective factors in personalized feedback to help reduce the risk of engaging in and frequency of DWH or RWHD.

Another goal of our study was to distinguish how specific marijuana-related driving cognitions (i.e., perceived dangerousness, injunctive social norms, perceived negative consequences) related to the likelihood and frequency of engaging in DWH and RWHD. Results suggested these marijuana-related driving cognitions were all associated with reduced frequency of DWH and RWHD for marijuana users who engage in these behaviors, over and above the influences of general marijuana expectancies, level of use, and gender. Students who believed driving after smoking was more dangerous were less likely to DWH and RWHD and those who thought their peers would refuse to RWHD were also less likely to RWHD. Perceived peer disapproval of DWH did not reduce risk for engagement in this behavior, however, and expectations regarding the likelihood of negative consequences did not reduce risk of DWH or RWHD. These findings replicate those of McCarthy and colleagues (2007), where results also suggested that perceived danger and social norms were most influential on engagement in marijuana-related driving behaviors, over and above perceived negative consequences. The finding that perceived negative consequences of DWH are not associated with this behavior may be a reflection of the difficulties associated with legal prohibition of DWH (e.g., feasibility of drug testing technology, DuPont et al, 2011) as well as a reflection of the recently instated laws that decriminalize medical marijuana (Hoffman & Webber, 2010). Additional studies should incorporate assessment of positive and negative expectancies, motives, and both injunctive and descriptive social norms regarding marijuana's effects within the context of an intervention to better understand how these cognitive factors impact DWH and RWHD, thus helping to facilitate the development of effective intervention strategies.

There were several limitations to the current study. Although we employed a large sample, results were obtained from a cross-sectional design, thus we cannot determine temporal sequencing or causal relationships. While our results point toward factors which may influence the risk of DWH and RWHD for students who use marijuana, additional longitudinal work will be required to determine whether these factors influence marijuana-related driving behavior over time or whether driving behavior influences the development of these factors or whether both of these processes occur. In addition, the sample was composed primarily of Caucasian, college freshmen that were an average age of 18 years old and from one geographical location. The lack of diversity of our sample limits the ability to generalize our findings to more diverse populations. At a broader level, quantifying marijuana use is difficult due to the inability to ascertain both the potency and amount used while smoking. In the present study, the driving while high measure inquired about driving within two hours of smoking marijuana, but did not differentiate between levels of consumption. This is a common limitation in marijuana studies (Blows et al., 2004; McCarthy et al., 2007), and developing methods of assessing quantity of marijuana consumption may be beneficial in future studies on the topic.

Despite these limitations, the current study provides insight regarding the relationships among marijuana expectancies, driving cognitions, and behaviors related to marijuana use and driving. Although a substantial body of research exists on factors related to drinking and

driving behaviors, less is known about the factors related to driving under the influence of marijuana. Results indicated that negative marijuana expectancies, perceived danger cognitions, and social norms were most associated with and protective against DWH and RWHD. Prevention and intervention efforts utilizing social norms and alcohol expectancies-based messages regarding alcohol use as well as drinking and driving have largely been successful in promoting protective behaviors (Labbe & Maisto, 2011; Perkins et al., 2010). Given the present findings, it may be beneficial to incorporate information about marijuana expectancies, cognitions, and social norms into efforts aimed at reducing DWH and RWHD.

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Table 1

Odds Ratios and Poisson Regression Coefficients for Zero-inflated Poisson Models Predicting Driving Behaviors from Marijuana Expectancies, Marijuana Use, and Gender

	Driving While High			
Variable	**OR**	**95% CI**	**β**	**SE**
Marijuana expectancy subscales				
Cognitive and behavioral impairment	0.80	0.50, 1.28	− .13***	.03
Relaxation and tension reduction	0.79	0.50, 1.24	.06	.04
Social and sexual facilitation	1.51	0.93, 2.45	.15***	.03
Perceptual and cognitive enhancement	1.45	0.84, 2.52	− .02	.04
Global negative effects	0.47***	0.31, 0.71	− .21***	.03
Craving and physical effects	1.41	0.87, 2.28	.05	.03
Male gender	2.09**	1.26, 3.48	− .04*	.02
Marijuana use frequency (past month)	1.90***	1.63, 2.22	.85***	.02
	Riding With a High Driver			
	OR	95% CI	β	SE
Marijuana expectancy subscales				
Cognitive and behavioral impairment	1.15	0.76, 1.73	− .20***	.03
Relaxation and tension reduction	0.84	0.58, 1.23	.02	.03
Social and sexual facilitation	1.21	0.79, 1.85	− .12***	.03
Perceptual and cognitive enhancement	0.88	0.56, 1.38	.18***	.03
Global negative effects	0.64*	0.45, 0.93	− .23***	.03
Craving and physical effects	1.15	0.78, 1.71	.18***	.03
Male gender	1.23	0.80, 1.90	− .04*	.02
Marijuana use frequency (past month)	1.71***	1.47, 1.98	.83***	.02

Note. OR = odds ratio; CI = confidence interval. β = standardized Poisson regression coefficient. SE = standard error of β.

* $p < .05$.

** $p < .01$.

*** $p < .001$.

Table 2

Univariate Associations Between Cognitive Predictors, Gender, Marijuana Use Frequency, and Driving Behaviors

Variable	1	2	3	4	5	6	7	8
1. Negative marijuana expectancies								
2. Perceived danger	**.31**							
3. Perceived negative consequences	**.24**	**.51**						
4. Social norms	**.34**	**.52**	**.35**					
5. Male gender	**− .02**	**− .23**	**− .30**	**− .15**				
6. Marijuana use frequency (past month)	**− .24**	**− .35**	**− .21**	**− .39**	.10			
7. Driving while high (past 3 months)	**− .29**	**− .34**	**− .22**	**− .30**	.07	**.50**		
8. Riding with a high driver (past 3 months)	**− .28**	**− .39**	**− .24**	**− .40**	.04	**.52**	**.67**	
Mean	2.45	2.30	2.21	1.23	0.51	2.84	4.72	9.16
SD	0.71	0.96	0.77	1.14	0.50	1.83	13.96	18.29

Note. Values are Pearson correlations (*r*). For cognition variables, higher scores reflect perceptions that DWH is less dangerous, the negative consequences less likely, and less acceptable to peers. Only non-zero values were used to calculate correlations for DWH and RWHD variables. Significant correlations ($p < .001$) are denoted in bold typeface. Gender was associated with marijuana use frequency at the .05 level, $p = .025$.

Table 3

Odds Ratios and Poisson Regression Coefficients for Zero-inflated Poisson Models Predicting Driving Behaviors from Marijuana Expectancies, Driving Cognitions, and Covariates

	Driving While High			
Variable	**OR**	**95% CI**	**β**	**SE**
Negative marijuana expectancies	0.58**	0.38, 0.87	– .11***	.02
Perceived danger	0.55**	0.38, 0.80	– .26***	.03
Perceived negative consequences	1.16	0.76, 1.77	– .05*	.02
Social norms	0.85	0.63, 1.15	–. 34***	.04
Male gender	1.81*	1.04, 3.12	– .08***	.02
Marijuana use frequency (past month)	1.81***	1.53, 2.13	.60***	.03
	Riding With a High Driver			
	OR	95% CI	β	SE
Negative marijuana expectancies	0.96	0.66, 1.41	– .13***	.02
Perceived danger	0.69*	0.50, 0.95	– .24***	.02
Perceived negative consequences	0.87	0.60, 1.28	– .04*	.02
Social norms	0.65**	0.51, 0.83	– .47***	.03
Male gender	0.78	0.47, 1.29	– .06***	.02
Marijuana use frequency (past month)	1.50***	1.28, 1.76	.48***	.02

Note. OR = odds ratio; CI = confidence interval. β = standardized Poisson regression coefficient. SE = standard error of β.

* $p < .05$.

** $p < .01$.

*** $p < .001$.