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Alcohol and marijuana use in early adulthood for at-risk men: Time-varying associations with peer and partner substance use

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Abstract

Background—Time-varying associations of 185 at-risk men's (from the Oregon Youth Study) substance use with that of their peers and partner over a 10-year period (ages 23 to 32 years) were examined. Moderation of effects by time with peers and partner and their age were tested.

Method—Growth models were used to predict changes in heavy episodic drinking (HED) alcohol use and marijuana use as a function of substance use by their female partners and male peers.

Results—Time with peers and peer substance use significantly predicted HED ($ORs=1.6, 2.3$), alcohol use ($ORs=1.6, 2.1$), volume of alcohol use ($IRRs = 1.5, 1.3$), and marijuana use ($ORs=12.8, 1.7$); peer marijuana use predicted volume of marijuana use ($B=2.5$). Partner substance use significantly predicted marijuana volume ($B=2.7$). Partner alcohol use predicted alcohol volume ($IRR=1.1$), but was moderated by time with partner and age ($IRR=1.0$). Time with partner and partner marijuana use predicted marijuana use ($OR=0.5, 2.7$), as did the interaction of the two ($OR=3.8$).

Conclusions—Outcome-specific substance use of peers and partners was significantly associated with indicators of alcohol and marijuana use in men's early adulthood, with robust effects of peer substance use through age 30 years and with time spent with peers influencing alcohol use. Time with partner was protective against marijuana use unless the partner used marijuana. Peers and partners should be considered in intervention efforts to effectively reduce men's substance use in early adulthood.

Keywords

Substance use; Alcohol; Marijuana; Peers; Partner; Free time

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Contributors

Capaldi and Hyoun designed the study and wrote the protocol. All authors designed analysis plan and Washburn performed all analyses. All authors contributed to and have approved the final manuscript.

Conflict of Interest All authors have no conflicts of interest.

1. INTRODUCTION

Heterogeneity in growth, persistence, and desistance of substance use in early adulthood has major consequences for health, and greater understanding is needed of proximal predictors of such variability for community samples. Guided by the dynamic developmental systems (DDS; Capaldi et al., 2005) approach that takes into account individual developmental history and social interaction (see also Kendler et al., 2011), we have formulated a model of the development of men's substance use across adolescence and early adulthood. This approach focuses both on general risk associated with the development of psychopathology, particularly antisocial behavior (Sher, 1991; Sher and Trull, 1994; Zucker, 2008), and on outcome-specific risk related to the substance used (e.g., partner alcohol use predicting men's alcohol use). In studies of growth in alcohol use in adolescence (Capaldi et al., 2009) and heterogeneity in alcohol use in early adulthood (Capaldi et al., 2013), we found that predictors of use in adolescence, such as parent substance use and youth antisocial behavior, showed limited prediction to heterogeneity in alcohol use in the 20s. Thus, the present study focused on proximal time-varying predictors of two key indicators of alcohol use – heavy episodic drinking (HED) and volume of use – and a single indicator of marijuana use – volume of marijuana use – each of which were assessed across ages 23-24 to 31-32 years for men at risk for antisocial behavior (the Oregon Youth Study [OYS]).

Social influence is a relatively consistent predictor of substance use, particularly alcohol use (Wood et al., 2001). Capaldi et al. (2009) found that peer use predicted significant growth in alcohol use in adolescence. Andrews et al. (2002) found that concurrent use of both same- and opposite-gender peers predicted alcohol use, binge drinking, and marijuana use in young adulthood. Fleming et al. (2010) found that exposure to substance-using peers in young adulthood predicted increases in heavy drinking and marijuana use. The influences of partner alcohol use have also been found over relatively short periods of time for young adults. Musquash et al. (2013) found small partner effects to men's and women's HED over a 28-day period for a young-adult sample. In a prior study with a subset of OYS men who consistently had a partner ($N = 110$ couples), Kim et al. (2013) examined across ages 20 to 29 years the associations of romantic partners' alcohol use with men's alcohol use. Findings indicated that partners' alcohol use was positively related to men's concurrent alcohol use across their 20s, regardless of relationship type (e.g., married vs. dating).

Some studies have examined influences of both peers and partners on substance use. D'Amico et al. (2005) examined influences of best friend and partner use of substances on alcohol or drug disorders (combined) in adulthood, and prediction was found from closest friends but not from partners' use of substances. Leonard and Mudar (2003) examined selection and influence processes related to peer and partner drinking over the transition to marriage (newlywed and first anniversary) and found mainly concurrent associations and influence over time only from husbands' drinking to wives' drinking. Past the period of young adulthood, the study of prediction from partner and peer influences to marijuana use is rare. Homish et al. (2007) found that spouses' use of marijuana prior to marriage was a strong predictor of their partners' increased risk for marijuana use during the first 4 years of marriage (controlling for time and individual risk factors).

The present study extends the study of influences on the course of adult substance use by examining men's partners' and peers' alcohol and marijuana use as predictors of their alcohol (both volume and HED) and marijuana use (respectively), and whether these associations are moderated by the amount of time the men spent with their friends and partners. The influence of peers and moderation by time was not tested in the study by Kim et al. (2013). Random intercept growth models were used for all three indicators of substance use, using a logistic model (HED), a zero-inflated count model (alcohol volume), or two-part semicontinuous model (marijuana volume). Alcohol and marijuana use by both peers and partners were included in the alcohol and marijuana prediction models, respectively. In the developmental period from ages 23-24 to 31-32 years, the amount of time spent with partners and peers is not well known, but time spent has been shown to be important for both forms of association (Haynie and Osgood, 2005). Men spending little time with peers may be less influenced by their drinking behavior than men spending more time with peers, even if the drinking behavior of the peers is similar. Thus, the interaction of time spent with peers and peers' drinking (assessed in the present study by the number of peers who get drunk) was examined; a similar interaction was examined for time with partners and partner drinking (assessed as amount of alcohol used by partner because matching alcohol indicators were not available for peers and partners).

Men were expected to vary in time spent with peers and partners as they matured across the 8-year period under study because the men were increasingly likely to be married (Shortt et al., 2012) and have children as they aged, and these familial changes are associated with decreases in substance use (Kerr et al., 2011). Thus, it was hypothesized that influences from partners may increase across this period whereas those from peers may decrease. It is important to note that Kim et al. (2013) found stable influences over a similar period while taking into account the relationship duration but without controlling for time men spent with their partners.

It was also predicted that differential influence would be found from peer and partner use to the differing indicators of substance use examined. Two thirds of the OYS men followed a high sustained trajectory of volume of alcohol use across the 20s, whereas relatively few men showed high levels of HED (Capaldi et al., 2013). We expected that sustained volume or regular drinking would be a behavior shared with and influenced by partner's drinking levels. For many men the more extreme behavior of HED may be likely to occur with friends, at bars, or other social gatherings. We thus predicted that partner's alcohol use would be more influential on volume of use, whereas peer's alcohol use would be more influential in prediction to HED. Assortative partnering has been found by marijuana use (Boutwell et al., 2012) and, for men to be using at all, denotes some tolerance for this illegal substance use on the part of their partners. Thus, we expected that both partner and peer marijuana use would be predictive of men's marijuana use.

2. METHODS

2.1. Sample

Schools in neighborhoods with higher incidences of juvenile delinquency were identified in a medium-sized metropolitan area, and boys in Grade 4 (ages 9–10 years) were invited to

participate in the study with their families. The OYS recruitment rate was 74.4% ($N = 206$), the sample was predominantly White (90%), and 75% were of lower socioeconomic status. The boys were followed yearly into their 30s. When the men were aged 17-19 years, the Couples Study was initiated to examine their romantic relationships and continued with assessments approximately every 2 years. The five waves for the present study were from the Couples Study covering ages 23 to 32 years and were combined with the synchronized assessments of the men from the OYS. All procedures were approved by the Institutional Review Board of the Oregon Social Learning Center.

Of the original 206 men, 185 had a female partner at least once in the period, with 639 observations across the 5 waves of data and an average of 3.5 observations (max = 5; min = 1); for the sample, 71% had 3 or more observations, 91% had 2 or more observations, and only 9% had a single observation. Men who never had a female partner during this period and two men with male partners were excluded from the analysis – in the latter case, to clarify that partner influences were from women. Men varied in relationship status; 19% of the observations were with a dating partner, 33% with a cohabiting partner, and 48% with a married partner.

2.2. Measures

2.2.1. Outcome variables—HED by the men involved consumption of five or more drinks at a time in the past 2 weeks (coded 0 = *no* and 1 = *yes*). Volume of alcohol use was calculated by multiplying frequency of use by the usual amount of alcohol consumed (both measured as natural numbers, i.e., no fractions) giving a count of the number of units consumed in a year. The distribution showed zero inflation and over dispersion. Volume of marijuana use was calculated by multiplying frequency of use (a natural number) by the usual amount of marijuana consumed (a rational number) – giving a continuous variable in grams with a natural zero – and was treated as a two-part semicontinuous variable (Olsen and Schafer, 2001). Both alcohol volume and marijuana volume were winsorized (Reifman and Keyton, 2010).

2.2.2. Partner and peer substance use—Partners were asked, on average, the number of drinks they drank at one time; across the period, partners drank 2.49 (median = 2) drinks at a time with a standard deviation of 1.91. Partner drinking was grand-mean centered for the analysis. A relatively small percentage of partners reported marijuana use; therefore, the variable was dichotomized (0 = *no* and 1 = *yes*). An average proportion of 0.33 partners reported marijuana use across the period, with a standard deviation of 0.47.

The peer alcohol use question addressed how many of the OYS men's friends got drunk once in a while (1 = *none of them*, 2 = *very few of them*, 3 = *some of them*, 4 = *most of them*, or 5 = *all of them*). Peer drunkenness had a mean of 3.33 (median of 3) across the period ($SD = 1.25$). For marijuana, the question concerned how many of their friends used marijuana, with the same response options. Peer marijuana use had a mean across the period of 2.27 (median of 2), with a standard deviation of 1.27. Both variables were grand-mean centered before analysis. Both variables were highly associated with one time reports from a close male peer.

2.2.3. Time spent with partner and peers—The men were asked the amount of free time they spent with their partner and in a separate question the amount of free time spent with male friends. Response options were coded as 1 = *none or almost none of the time*, 2 = *some or little of the time*, 3 = *about one half my time*, 4 = *a lot of my time*, 5 = *all or most of my time*. Across the period, partners (and peers) showed a mean of 3.81 (2.36), medians 4 (2), and standard deviation 1.19 (0.81). Both variables were grand-mean centered before analysis.

2.2.4. Age and interaction variables—Men's age at the time of interview (which varied with time) was grand-mean centered, and then interactions between age and substance use variables for both partner and peer were created. No interactions between partner and peer variables were hypothesized or included.

2.3. Data analytic plan

The analyses involved longitudinal growth models, with modifications depending on the distributional properties of the dependent variable. For each outcome, two series of models were run in Mplus 7.1 (Muthén and Muthén, 1998-2012): (1) prediction from partner variables and (2) prediction from both partner and peer variables. For each series, a full model with all planned interactions was first estimated. Interactions were removed if nonsignificant ($p < .05$). Nonsignificant two-way interactions were retained if related three-way interactions were significant.

Regarding selection of a model suited to the distribution of the substance use outcome, the zero-inflated nature of marijuana use was evident (61% non-use on average). Even though only 8% of the men on average reported no alcohol use, a series of simple outcome models (no random effects) suggested – from comparisons of the AIC, BIC, and log likelihood ratio tests – that the zero-inflated negative binomial model fit the data best (Scott and Freese, 2006). Alcohol volume was estimated with multilevel zero-inflated negative binomial regression (Hall, 2000), with a random intercept for the count model. Marijuana volume was estimated with a two-part semicontinuous model (Olsen and Schafer, 2001), with random intercepts for both parts. The difference in analysis used for alcohol and marijuana volume stems from the fact that alcohol volume is a simple count variable with dispersion, whereas marijuana volume was a continuous outcome with a natural zero. Both alcohol and marijuana models predicted binary use and volume simultaneously. As HED was a dichotomous variable, it was estimated with a multilevel random intercept logistic regression model.

3. RESULTS

3.1. Descriptive statistics

The means of each outcome (including binary proportions indicating use versus non-use) are shown in Table 1. The prevalence of HED (a dichotomous variable only) was fairly consistent over time, with a slight decrease from ages 23-24 to 25-26 years. The proportion of men reporting any alcohol use in the last year was high and remained consistently high across the period of study. Mean alcohol volume remained fairly stable across the period,

with a slight increase from ages 23-24 to 25-26 years. The proportion of men using marijuana was fairly stable across the last four time points with a drop from ages 23-24 to 25-26 years. The mean volume of marijuana use was variable across the five time points with no clear linear progression during the period.

3.2. Heavy episodic drinking model

For the HED prediction model (Table 2), there were no significant associations for the partner variables or for any interactions (Model I and Model II). However, as hypothesized, time with peers and peers' drunkenness were both significantly and positively associated with HED (Model II). None of the interaction terms with peer variables was significant.

3.3. Alcohol volume model

For the binary (use versus non-use) portions of the alcohol volume models (I and II), there were no significant results for the partner variables or for any interactions (Table 3, Alcohol Binary). In Model II, both greater time spent with peers and peer drunkenness were associated with greater likelihood of some alcohol use in the past year. The count portions of the alcohol volume models (Table 3, Alcohol Count) showed consistent effects for partner variables across Model I (partner only) and Model II (partner and peer), with the main effect of partner alcohol use and the three-way interaction of age by time spent with partner and partner alcohol use showing significance. Figure 1 illustrates this result for an average value on the peer variables. For men who reported spending little time with their partner (Figure 1A), the effect of partner alcohol use was strong in the early 20s (seen by the gaps between lines) but not apparent by the early 30s; whereas for men who reported spending a lot of their time with a partner (Figure 1B), there was essentially no association of partner alcohol use in the early 20s and a stronger association in the early 30s. Peer drunkenness and time spent with peers were significantly associated with more alcohol use (Model II); however, there were no significant interactions of peer variables, and the partner predictors remained significant with peer predictors in the model.

3.4. Marijuana model

In prediction to use versus non-use of marijuana, significant associations were found for both partner and peer variables (Table 4, Models I and II, Marijuana Binary). Regarding partner predictors, time with partner, partner marijuana use, and their interaction were significant. More time with partner was associated with less probability of use, and partner marijuana use was associated with greater probability of use. The direction of the interaction suggested that men with partners who used marijuana were more likely to use the more time they spent with their partner (Figure 2, Panels A and B). When the men spent less time with their partners, the partner's use versus non-use had a relatively low association with the probability of the men's use. However, at higher levels of time spent with partner, the men showed a considerably higher probability of use (around .60 across the age span) when the partner used marijuana than when the partner did not use marijuana (around .15 across the age span).

In Model II, the main effect for time spent with peers on the probability of use versus non-use of marijuana was not significant, but the main effect of peer marijuana use and the

interaction between the two variables were significant (Table 4, [Marijuana Binary] and Figure 2 [Panels C and D]). Figure 2C, showing the association of three levels of peer marijuana use for those men who spent relatively low amounts of time with peers, indicates a relatively rank-ordered association of levels of peer marijuana use with the men's probability of use. At high levels of time spent with peers (Figure 2D), the men have a high probability of use if their friends used marijuana at any level.

For the count portions of the marijuana models (Models I and II, Panel B), significant effects were found for partner marijuana use but not for partner time. In addition, peer marijuana use was related to a higher volume of marijuana use by the men, but time spent with peers was unrelated.

4. DISCUSSION

The study examined peer and partner influences on changes in levels of alcohol use, HED, and marijuana use across 10 years in early adulthood for men. Use levels were relatively constant across the period, although they showed an association with age and decrease over time for marijuana use versus non-use. The drop for HED, alcohol volume, and marijuana use between ages 23-24 and 25-26 years may be related to transitioning from young adulthood, although likely not with leaving a university as few men attended 4-year colleges. Other transitions such as marriage or parenthood may have been related to a decline (Kerr et al., 2011). As expected, positive associations of outcome-specific peer and partner substance use (i.e., alcohol to alcohol, marijuana to marijuana) were found for all three outcomes (two indicators of alcohol use and one of marijuana use), and in some instances, the associations varied by men's age and with the amount of time they spent with peers and partners.

The peer outcome-specific predictors were consistently positively associated with the three substance use outcomes (including both binary and count parts). Time with peers was also always positively associated with the outcomes, although in two cases (the binary and count models for marijuana use) not significantly so. However, in the case of the prediction of use versus non-use for marijuana, the interaction between time with peers and peer marijuana use was significant; this was, however, the only significant interaction involving any of the peer variables. This observed associations of peers' substance use with men's substance use is consistent with the findings by Andrews et al. (2002) and D'Amico et al. (2005), but not as we hypothesized.

Differing associations for peer and partner influences were hypothesized, and some were found in the analyses. Partners had the greatest influence on marijuana use but no influence on HED, with alcohol volume in the middle. However, partner HED or drunkenness was not used as a predictor and might have been associated with HED. Time spent with partner had no association with the alcohol outcomes but did have a complex association with marijuana use. Less time with partner was related to a greater likelihood of use, with an interaction term that reversed the effects when partners used marijuana (i.e., more time with a marijuana-using partner was associated with a greater likelihood of use).

We had expected the associations with peer variables to decrease in strength by age 30 years, but this was not the case. However, the associations with partner variables and the count portion of alcohol volume changed over time. The change in the association of alcohol volume with both time spent with partner and partner alcohol use was dependent on the value of the other partner variable.

The difference among the outcomes in the findings provides insights into influences on substance use in early adulthood. First, levels of use overall were relatively stable across time, except for volume of marijuana use. The illegal nature of marijuana and potential inconsistent nature of supply may have resulted in the sporadic nature of the amount used. Second, as predicted, peer but not partner influences were strong for HED – indicating the importance of limiting contact with drinking peers in treatment of HED. The partner measure was the number of drinks on a drinking occasion, whereas the peer measure was of peer drunkenness and therefore not directly comparable. However, it is informative that amount of use by partner was not predictive of men's HED. The findings regarding effects of partner alcohol use are not consistent with those of Mushquash et al. (2013), who found effects of partner use, but they are consistent with those of D'Amico et al. (2005). It is also possible that design differences in ages and time between measurements could account for the disparate findings. As predicted, however, partners' alcohol use was predictive of volume of alcohol use in the presence of peer variables.

This study has some limitations. First, alternative explanations of findings include both choice of partner, or assortative partnering, and that the men's substance use may have influenced their peers and partners, or bidirectional effects may have been present (Mushquash et al., 2013). Second, differential effects, depending on types of relationships with partners, are possible but were not examined in the present study because the models examined were already complex and that time with partner was related to relationship status. Third, partner variables were either a count of amount of substance use (alcohol) or a binary measure of use (marijuana), whereas the peer variables were numbers of friends that exhibited a behavior. Additionally, peer use was reported on by the men, while partners reported on their own use. Consequently, caution is needed in comparing peer and partner effects for the alcohol models. Note, however, that there is an inherent difference between peer and partner influences in that men usually have only one partner at a time, whereas it is usual to have a number of male peers. Also, peer alcohol use involved the number of friends that get drunk rather than level of use, and this may particularly have affected partner versus peer contributions in the HED model. Finally, the sample was male and predominantly (although not exclusively) Euro American; examination of similar influences on adult substance use in other ethnic groups and for women is needed. However, findings of the study have generally been in line with other U.S. longitudinal studies both for issues of partner and peer influences (e.g., Dishion et al., 1995) and etiology of substance use (e.g., Capaldi et al., 2009).

Overall, the findings indicate substantial associations of peer and partner use of alcohol on men's alcohol use and, similarly, effects of peer and partner marijuana use on men's marijuana use across the decade of the 20s – with some evidence of moderation of effects by time spent with partner and men's age, as well as by the type of alcohol use outcome

examined. These findings highlight the importance of influences on substance use within key social relationships in early adulthood, and differences in the prediction models have implications for prevention approaches.

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Note: Lines represent amount partner drinks on average when they drink.

Fig 1.

Partner variable interactions for partner and peer alcohol volume count model.

Fig 2.

Partner (Panel A and B) and peer (Panel C and D) variable interactions for partner and peer marijuana binary model.

Table 1

Men's alcohol and marijuana use by age (means and standard deviations).

Age in years	23-24	25-26	27-28	29-30	31-32
<i>N</i>	128	133	127	124	127
Heavy episodic drinking	0.34	0.28	0.29	0.28	0.29
	(0.47)	(0.45)	(0.46)	(0.45)	(0.46)
Alcohol: Use	0.92	0.91	0.93	0.91	0.91
	(0.27)	(0.29)	(0.26)	(0.29)	(0.29)
Alcohol: Volume	404.99	433.39	422.08	440.89	441.57
	(499.78)	(562.75)	(525.76)	(525.48)	(525.38)
	<i>N</i> = 118	<i>N</i> = 122	<i>N</i> = 118	<i>N</i> = 113	<i>N</i> = 115
Marijuana: Use	0.51	0.37	0.36	0.34	0.34
	(0.5)	(0.49)	(0.48)	(0.48)	(0.48)
Marijuana: Volume	79.29	97.53	56.96	75.37	81.77
	(154.88)	(264.1)	(106.57)	(158.04)	(185.18)
	<i>N</i> = 65	<i>N</i> = 50	<i>N</i> = 46	<i>N</i> = 42	<i>N</i> = 43

Note: *N*s for volume change as the number of people that use change each wave.

Table 2

Heavy episodic drinking prediction models.

	I		II	
	Partner only		Partner and peer	
	<i>OR</i>	<i>SE</i>	<i>OR</i>	<i>SE</i>
Age	0.958	0.043	1.028	0.044
Partner time	0.893	0.108	0.988	0.109
Partner alcohol	1.067	0.063	1.047	0.059
Peer time	--	--	1.600	0.146**
Peer drunkenness	--	--	2.239	0.138***
Random effects	<i>B</i>	<i>SE</i>	<i>B</i>	<i>SE</i>
Intercept	3.725	0.957***	2.922	0.842**

OR = Odds Ratio, SE = Standard Error

*
 $p < .05$.**
 $p < .01$.***
 $p < .001$.

Table 3

Alcohol volume prediction models.

	I		II	
	Partner only		Partner and peer	
	<i>OR</i>	<i>SE</i>	<i>OR</i>	<i>SE</i>
A. Alcohol binary				
Age	0.959	0.055	1.026	0.058
Partner time	0.976	0.141	1.040	0.142
Partner alcohol	0.926	0.083	0.907	0.057
Peer time	--	--	1.636	0.245*
Peer drunkenness	--	--	2.065	0.164***
B. Alcohol volume				
	<i>IRR</i>	<i>SE</i>	<i>IRR</i>	<i>SE</i>
Age	1.007	0.020	1.037	0.020
Partner time	0.916	0.048	0.998	0.043
Partner alcohol	1.119	0.035**	1.097	0.034**
Partner time X alcohol	1.007	0.020	0.987	0.020
Age X partner time	1.006	0.014	1.000	0.014
Age X partner alcohol	0.986	0.011	0.989	0.012
Age X partner time X alcohol	1.024	0.009**	1.023	0.009*
Peer time	--	--	1.452	0.061***
Peer drunkenness	--	--	1.298	0.044***
Random effects				
	<i>B</i>	<i>SE</i>	<i>B</i>	<i>SE</i>
Intercept	1.204	0.140***	0.994	0.122***
Dispersion	0.734	0.066***	0.666	0.058***

OR = Odds Ratio, SE = Standard Error, IRR = Incidence Rate Ratio

*
 $p < .05$.**
 $p < .01$.***
 $p < .001$.

Table 4

Marijuana volume prediction models.

	I		II	
	Partner only		Partner and peer	
	<i>OR</i>	<i>SE</i>	<i>OR</i>	<i>SE</i>
A. Marijuana binary				
Age	0.868	0.056*	1.006	0.058
Partner time	0.489	0.170***	0.515	0.201**
Partner marijuana	8.593	0.402***	2.675	0.412*
Partner time X marijuana	2.907	0.262***	3.785	0.366***
Peer time	--	--	1.246	0.272
Peer marijuana	--	--	12.769	0.337***
Peer time X marijuana	--	--	1.709	0.245*
Random effects	<i>SD</i>	<i>SE p</i>	<i>SD</i>	<i>SE p</i>
Intercept	2.948	2.213***	2.183	1.970*
B. Marijuana volume				
	<i>B</i>	<i>SE</i>	<i>B</i>	<i>SE</i>
Age	0.952	0.053	1.024	0.115
Partner time	1.149	0.121	1.560	0.321
Partner marijuana	2.007	0.339*	2.674	0.412*
Peer time			0.773	0.163
Peer marijuana			2.521	0.197***
Random effects	<i>SD</i>	<i>SE p</i>	<i>SD</i>	<i>SE p</i>
Intercept	2.447	4.871**	2.061	0.791***

OR = Odds Ratio, SE = Standard Error

*
 $p < .05$.**
 $p < .01$.***
 $p < .001$.