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Longitudinal family effects on substance use among an at-risk adolescent sample

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Abstract

Objective—Adult and peer factors may influence whether adolescents use alcohol and other drugs (AOD). This longitudinal study examined the direct effects of adult monitoring, perceived adult AOD use, and cultural values on adolescent AOD use.

Methods—Participants were 193 at-risk adolescents referred to a California diversion program called Teen Court for a first-time AOD offense. We assessed youth reports of past 30 day AOD use (any alcohol use, heavy drinking, marijuana use), demographics, changes in parental monitoring and family values (from baseline to follow-up 180 days later), as well as family structure and perceived adult substance use at follow-up.

Results—Adolescents who reported that a significant adult in their life used marijuana were more likely to have increased days of drinking, heavy drinking, and marijuana use at follow-up. Higher levels of familism (importance the teen places on their family's needs over their own needs) and being in a nuclear family served as protective factors for future alcohol use. Additionally, poor family management was associated with increased alcohol use and heavy drinking.

Conclusion—Findings highlight how family management and perceptions of adult marijuana use influence subsequent adolescent AOD use, and how an increase in familism over time is associated with a decrease in adolescent drinking. Tailoring interventions, by including the teen's family and/or providing support to adults who use AOD may be crucial for improving interventions for adolescent AOD use.

Keywords

Parental Monitoring; Adolescents; Substance Use

1. Introduction

Adolescence represents a critical time to prevent alcohol and other drug (AOD) use. Early initiation and regular use is often associated with negative consequences, including problems in school (Broman, 2009; Patton et al., 2007; Wheeler, 2010), early initiation of sexual intercourse (Cavazos-Rehg et al., 2011a; Cavazos-Rehg et al., 2011b; Stueve and

O'Donnell, 2005), and delinquent behavior (D'Amico et al., 2008; Ford, 2005). Continued use during this developmental time can lead to future AOD use and concurrent physical and mental health problems (D'Amico et al., 2005; Ellickson et al., 2004; Gore et al., 2011; Hingston et al., 2006; Merline et al., 2008; Norström and Pape, 2012; Zucker et al., 2008).

1.1 Adult and family influence on youth AOD use

Parents and guardians influence adolescents' development in many ways such as providing family structure, instilling values, and regulating how time is spent. About 91% of adolescents perceive that their parents would disapprove of AOD use, and youth who perceive strong disapproval tend to report less past month AOD use compared to youth who do not perceive strong disapproval (SAMHSA, 2012). In addition, parental monitoring, such as establishing clear rules about AOD use and providing opportunities for involvement in family decisions, have been shown to reduce teen AOD use (Cleveland et al., 2010; Lac et al., 2009; Lac and Crano, 2009; SAMHSA, 2012; Schinke et al., 2009; Van Ryzin et al., 2012; Vermeulen-Smit et al., 2012), even in high-risk populations (Clark et al., 2012, Henderson et al., 2009). In contrast, a lack of monitoring is associated with earlier initiation and increased AOD use (Adalbjarnardottir and Hafsteinsson, 2001; Barnes et al., 2006; Tobler and Komro, 2010). Encouragement to make healthy choices by fostering positive interactions such as involving teens in family decisions protects against future AOD use and peer influence to use (Donovan, 2004; Jang et al., 2013; Wood et al., 2004).

Family structure may also influence future adolescent AOD use (Barrett and Turner, 2006; Donovan, 2004), with an intact nuclear family or two-parent household potentially serving as a protective factor. However, Crawford and Novak (2008) found that whereas family structure has an effect on AOD use, a larger portion of the effect is accounted for by parenting style, indicating that the quality of the family's interaction has a strong effect on youth AOD use.

Substance use by adults important to the teen is also associated with adolescent AOD use. Youth who live with a parent or guardian who uses AOD are at increased risk for greater drinking (Kuntsche and Kuendig, 2006; Latendresse et al., 2008; Mason and Spoth, 2012; van der Vorst et al., 2005) and marijuana use (Li et al., 2002). Paternal alcohol use is also associated with greater levels of adolescent drinking and greater increases in use (Mares et al., 2012). Recent parental marijuana use is associated with subsequent initiation of adolescent marijuana use within the next year (Miller et al., 2013). Of note, parental AOD use significantly affects adolescents' future AOD use even after controlling for peer influences or parenting styles (Adalbjarnardottir and Hafsteinsson, 2001; Li, 2002; Mrug and McCay, 2012; Vermeulen-Smit, 2012).

Two additional family factors associated with adolescent AOD use are familism (i.e., importance the teen places on their family's needs over their own needs) and filial piety (i.e., parental respect; Unger et al, 2002). Recent work has shown the protective nature of familism and filial piety in relation to different racial and ethnic groups (Shih et al., 2010; Unger et al., 2002; Wahl and Eitle, 2010). High levels of familism serve to protect against heavy drinking among Hispanic adolescents (Wahl and Eitle, 2010) and are also protective

for Caucasian and Asian youth (Shih et al., 2010). Filial piety has also been shown to influence Asian adolescents to obey their parents' rules about AOD use (Unger et al., 2002).

1.2 Peer influence on youth AOD use

There is a great deal of work showing that peers influence adolescent AOD use (Barnes, 2006; Donovan, 2004; Eitle, 2005; Ramirez et al., 2012; Tucker et al., 2011), and that peer influence tends to increase during middle and high school (Steinberg and Monahan, 2007). AOD use also increases during this time, with adolescents who perceive AOD use among their peers increasing their AOD use more substantially than those who do not perceive peer use (D'Amico and McCarthy, 2006; Olds et al., 2005; Piontek et al., 2012). Time spent around peers who use AOD has also been shown to be a risk factor associated with AOD use (Maxwell, 2002; Poelen et al., 2007). These peer influences have been found in multivariable modeling situations where family factors such as perceived parental use, monitoring, and family structure have also been observed (Bergh et al., 2010; Crawford and Novak, 2002; van den Bree and Pickworth, 2005; Wood et al., 2004). Historically, research has indicated that peer influence may have a greater impact on adolescent AOD use than family factors (Crawford and Novak, 2002; van den Bree and Pickworth, 2005; Jackson, 1997; Windle, 2000; Wood et al., 2004), with one recent study finding that peer influence becomes an even stronger predictor as adolescents age (Mrug and McCay, 2012). Thus, in any examination of the influence of family factors on adolescents, it is imperative to concurrently control for the influence of an adolescent's peers.

1.3. The Current Study

The existing research on family influences on adolescent AOD use is limited to cross-sectional evaluations and general population samples. The current study adds to the literature by longitudinally examining how changes in parental monitoring and family values over time are associated with at-risk adolescent AOD use while controlling for peer influence and baseline AOD use.

Secondly, delinquency, such as a first time AOD-related offense, has been shown to be positively associated with changes in AOD use (Mason and Windle, 2002) so one would expect that having this type of offense may affect future AOD use and monitoring. When parents are made aware of a potential AOD use problem, they may exert greater influence over the adolescent or it may be more difficult for them to monitor their adolescent. There is little research examining how parental influence may change once they recognize that AOD use has become a problem for their adolescent. Our data allow us to answer this question by examining whether these specific family factors provide additional protection or risks after an AOD offense.

For each outcome we evaluated the effects of monitoring, family structure and values, and perceived adult AOD use in a series of regression models. We hypothesized that increased monitoring and stronger family values would lead to decreased AOD use, whereas perceptions of adult use would lead to more adolescent AOD use. Further, we expected that these family factors would remain significant even after controlling for peer influences.

2. Methods

2.1 Participants

Participants aged 14 to 18 years old were referred to Santa Barbara Teen Court between 2008 and 2011, a program operated by the Council on Alcoholism and Drug Abuse (D'Amico et al., 2010; D'Amico et al., 2012). These adolescents had committed a first time AOD offense and did not warrant more serious intervention. All study protocols were approved by the institution's review board.

2.2 Procedures

This study was a part of a randomized controlled trial comparing the efficacy of the usual care group AOD sessions to a group-based Motivational Interviewing intervention called *Free Talk* (D'Amico et al., 2010; D'Amico et al., 2012; D'Amico et al., 2013). Parents of teens younger than 18 years of age were required to consent to their teen's participation and all teens needed to assent (under 18) or consent (18). Both groups received six sessions. Exclusion criteria included multiple serious offenses, referral to another program, or possession of a medical marijuana card. Of those eligible (n=216), 11% were either not interested or unable to participate. Demographically, there were no significant differences between teens that refused and teens who participated in the study. Prior to the hearing, youth completed a survey administered by trained study staff and completed another survey approximately 180 days after completing AOD group sessions. All surveys were administered individually in a private location. The parents were also highly encouraged to attend a 6-session parenting group.

2.3 Measures

2.3.1 Demographics—Demographic information included age, gender and race and ethnicity.

2.3.2 AOD Outcomes—Past 30 day drinking, heavy drinking (5 or more drinks within a few hours) and marijuana use were assessed at baseline and follow up using an 8-point scale to indicate the number of days used (1='0 days' to 8='21–30 days').

2.3.3 Parental Monitoring—Seven family management items which were rated on a 4-point scale (1= "Strongly Agree" to 4= "Strongly disagree") (e.g. "my parents or guardians ask if I've gotten my homework done"; Eitle, 2005; Glaser et al., 2005) were averaged such that a higher score indicated poor family management ($\alpha=0.87$). Family involvement included three items rated on the same 4-point scale (e.g. "My parents or guardians ask me what I think before most family decisions affecting me are made"; $\alpha=0.78$; Arthur et al., 2002; Fagan et al., 2007). Items were reverse scored and averaged with a higher score indicating more opportunities for involvement. To account for possible changes in monitoring that may have occurred after the offense we calculated a change score where a positive score indicated an increase in poor family management or involvement at follow-up compared to baseline.

2.3.4 Family Structure—At follow-up participants were asked which adults they currently lived with. There were 9 response options. Teens who selected both ‘my mother’ and ‘my father’ were classified as living with their nuclear family (Ellickson et al., 2001).

2.3.5 Perceived Adult AOD Use—At follow-up, adolescents were asked how often the adult most important to them drinks alcohol and uses marijuana. Responses ranged from 1=“Never” to 4=“4–7 times a week”. To further classify riskiness associated with adult alcohol use we transformed the original responses into a dichotomous variable indicating drinking 4–7 times a week versus anything less than that. Due to a low prevalence of reported adult marijuana use this item was recoded to indicate any use.

2.3.6 Family Values—Four items assessed familism (Cuellar et al., 1995, Unger et al., 2002) and were rated on a 4-point scale (1= “Definitely no” to 4=“Definitely yes”) (e.g. “If anyone in my family needed help, we would all be there to help them.”; $\alpha=0.69$). Filial piety was assessed using the same 4-point scale (Ho, 1994; e.g. “I want to be a good person so that people know that my parents raised me right.”; $\alpha=0.87$). Items were averaged such that higher scores indicated higher levels of familism and filial piety. Familism captures the importance the teen places on their family’s needs over their own individual needs whereas filial piety touches more on the respect that the teen holds for their parents. These items have been shown to work well with diverse populations of adolescents (Miles et al., 2012). We calculated a change score in order to evaluate how values might change over time.

2.3.7 Peer Influence—Two items assessed peer influence by asking the time spent around teens that used alcohol or marijuana to assess the riskiness of the peer environment (Tucker et al., 2003). Each item was rated on a 4-point scale (1=“Never” to 4=“Often”).

2.4 Statistical Analyses

We examined the means and percentages of demographic, monitoring, family values, and peer influence items at baseline and follow-up. Adult AOD use and family structure were examined at follow-up. We examined the change scores of parental monitoring and family values on adolescent AOD use as reported at the 180-day follow-up survey. For each AOD use outcome we conducted a series of regression models to identify predictors of AOD use. We evaluated our model to make sure assumptions of linearity, normality, homogeneity of variance and independence were met. Further we explored variance inflation factors to assess the multicollinearity of the predictors.

The base model controlled for baseline AOD use, age, intervention condition, gender, Hispanic/Latino/a ethnicity, and peer influence. To our base model we added individually three blocks of variables, 1) change in monitoring and family structure reported at follow-up, 2) adult AOD use reported at follow-up, and 3) change in family values, to examine how adjusting for each block affected the association between family factors and adolescent AOD use. The final multivariable model consisted of all control variables in the base model and the three blocks of variables. We used mean and modal imputation to account for a minimal amount of missing data. At baseline 2 items (adult marijuana use and 1 filial piety

item) were missing for 3 participants (1.6%) and at follow-up 1 filial piety item was missing for 1 participant (<1%).

3. Results

3.1 Sample

The mean participant age was 16.64 years ($SD=1.05$). Sixty-seven percent were male, 45% were Hispanic, 45% White and 10% identified another race. At baseline 63% of teens reported alcohol use in the past 30 days and 61% reported marijuana use in the past 30 days. Rates were similar at follow up with 66% of teens reporting any alcohol use and 52% reporting marijuana use (Table 1).

3.2 Alcohol Use

After controlling for baseline use, demographics, intervention and peer influence, regression models for adolescent past month drinking at follow-up showed that poor family management, nuclear family, perceived adult marijuana use, and familism were all significantly related to adolescents' alcohol use. These same findings were observed in the multivariable model (Table 2). As poor family management increased, alcohol use increased (estimate=0.17, $SD=0.18$, $p=0.019$). Teens living with both their mother and their father reported significantly less alcohol use (estimate=-0.12, $SE=0.19$, $p=0.049$). Reported marijuana use by an important adult was also significantly associated with greater adolescent alcohol use (estimate=0.16, $SE=0.25$, $p=0.007$). Familism served as a protective factor, families that increased family strengthening values after the AOD offense had adolescents that reported less current drinking (estimate=-0.19, $SE=0.18$, $p=0.007$).

In multivariable models for heavy drinking, as poor family management change scores increased, heavy drinking increased (estimate=0.21, $SE=0.17$, $p=0.008$). Perceived adult marijuana use was also associated with more heavy drinking in the past month (estimate=0.14, $SE=0.24$, $p=0.022$). As familism change scores increased, heavy drinking decreased (estimate=-0.18, $SE=0.17$, $p=0.015$).

3.3 Marijuana Use

In both the initial single block and multivariable models, perceived marijuana use by an adult was the only family factor that was significantly associated with increased adolescent marijuana use (estimate=0.19, $SE=0.37$, $p=0.003$).

4. Discussion

We examined the longitudinal effects of parental monitoring and family values, and how family structure and adult AOD use influences AOD use among at-risk youth. Because peers have an effect on adolescents' AOD use (Barnes et al., 2006; Donovan, 2004; Eitle, 2005; Ramirez et al., 2012; Tucker et al., 2011), we controlled for time spent around peers who use AOD to evaluate which family factors had an influence on AOD use above the known effects of peer influence. By utilizing change scores for the monitoring and family values scales, we were able to investigate how these qualitative measures may have changed after an AOD offense.

Increases in poor family management after the AOD offense were associated with greater alcohol use and heavy drinking. Increases in family involvement did not serve as a protective factor for AOD use; however, having an intact nuclear family was associated with reduced adolescent alcohol use. Teens that lived with both parents reported fewer days of alcohol use.

Consistent with previous research (Shih et al., 2010; Unger et al., 2002; Wahl and Eitle, 2010), high familism was associated with less alcohol use. Given that our sample was 45% Hispanic/Latino, our results do not seem surprising. It is interesting to note that we found this effect, even after controlling for race and ethnicity, suggesting that these family values may be relevant for reducing drinking among other ethnic groups (Miles et al., 2012). Understanding the influence parents have on adolescents' drinking is crucial to improving interventions aimed at reducing youth AOD use.

Perceived adult alcohol use did not affect youth's alcohol use or heavy drinking. This finding may be related to how we measured adult drinking. Previous studies have found that more severe measures of adult alcohol abuse or dependence have been associated with greater teen use (Barrett and Turner, 2006; McGue et al., 1996; Vermeulen-Smit et al., 2012). Our measure of frequency of adult drinking may not have been sensitive to change. For example, the quantity of parental alcohol use may be more associated with teen use (Vermeulen-Smit et al., 2012). This emphasizes the importance of asking not only about adult frequency of drinking, but also about quantity.

In contrast, we found that perceived adult marijuana use was predictive of adolescent's AOD use. This is consistent with other studies that have shown that adult marijuana use significantly affects whether an adolescent drinks, uses marijuana or smokes cigarettes (Li et al., 2002; Miller et al., 2013). This may be due to qualitative differences in alcohol versus marijuana use. Of note, the prevalence of perceived adult marijuana use in this study was 16%, which is three times greater than nationally reported data on adults 26 years and older (4.8%; SAMHSA, 2012). Our findings suggest that youth who are starting to experience negative consequences from their AOD use may also have important adults that are using AOD. Thus, it may be important to screen parents for AOD use and encourage those who report risky AOD use behaviors to also participate in AOD use interventions.

Contrary to other studies (Van Ryzin et al., 2012; Tobler and Komro, 2010) we found that neither parental monitoring nor family structure had a significant impact on marijuana use. Future research should more closely examine the differential influences family factors (e.g., medical marijuana cards; social drinking) may have on teens using a variety of drugs.

Given the high rates of substance use in our sample compared to national statistics (SAMHSA, 2012) and that one-third of these at-risk youth still reported drinking heavily at follow-up, findings highlight the importance of providing support to parents and significant adults of at-risk youth. Recent research has shown that parent-based interventions to facilitate communication about alcohol use have been particularly effective for high-risk young adults (Cleveland et al., 2013; Schinke et al., 2009), and family interventions are among the most effective interventions for adolescents who use AOD (Tanner-Smith et al.,

2013; Waldron and Tuner, 2008). For adults who use substances themselves, parallel interventions may be helpful to provide support to the adults (e.g., individual therapy) while youth are also in treatment. For teens who have adults in their lives that use AOD, it may be important to discuss with teens the influence these adults have on their use and, similar to discussions around peer use, discuss ways to reduce their use if they are ready to do so. Even as some youth transition to early adulthood and head to college, parents still can have significant influence over the choices teens make regarding alcohol use (Abar and Turrisi, 2008).

Overall, family factors were related to adolescents' AOD use even after controlling for peer influence. Other studies have shown that parents affect the choices that their adolescent makes in spite of peer influence (Bergh et al., 2010; Crawford and Novak 2002; van den Bree and Pickworth, 2005; Wood et al., 2004). Our results are unique since we not only observed the influence of parents' behaviors on teen AOD use when controlling for peer influences, but we also observed, for alcohol use, that changes in qualitative family characteristics can affect AOD use as well.

4.1 Limitations

It is important to note that our sample was recruited from one program in Southern California and therefore may not be representative of at-risk youth nationally. Additionally, all outcomes were self-report. However our study procedures (e.g., discussing confidentiality and providing a safe, private space to complete the survey) allow us to feel confident that we collected accurate data. Parents were offered the opportunity to attend sessions about teen AOD use but we were unable to collect data on amount of attendance to link back to the adolescent participants; thus, we do not know whether parents who increased in their monitoring, for example, were the parents who were more likely to attend the parenting groups.

Also, adult AOD use was reported by the teen. Although this could be seen as a limitation since we did not collect actual use from the adults, many studies use perception of use as a proxy (e.g., Abar and Turrisi, 2008; Cail and LaBrie, 2010; LaBrie et al., 2010). Similarly, an adolescents' perception of use is likely just as important as the actual amount the adult is using, particularly if the adult's use is covert. That is, through the social modeling processing, teens observing a parent drink several glasses of wine at dinner is likely to have a greater influence than if a parent drank shots outside of the teen's view. Comparisons between actual and perceived adult use are needed.

Finally, not all variables were conducive to change score calculation, such as parental AOD use and family structure. For this reason, we had to include these variables at the time point for which they were measured.

4.2 Conclusion

Overall our study found that after an AOD offense, increased family values were protective of youth alcohol use whereas reductions in family management put adolescents at risk for use. Having an intact nuclear family was protective of youth drinking whereas marijuana use by an important adult increased the chances of adolescent marijuana use. Tailoring

subsequent interventions, specifically diversion programs, by including the teen's family and/or providing support to parents or adults who use AOD is an important adjunct to interventions for adolescent AOD use. Future research with larger samples, a longer follow-up and data collection on parent involvement and AOD use can provide further insights on how family factors influence AOD use among at-risk youth, which could lead to enhancements to treatment for this population.

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Table 1

Sample Baseline and Follow-Up Characteristics

Variable	Baseline		Follow-Up		Change Score	
	Mean/Percentage	SD	Mean/Percentage	SD	Mean Change	SD
<u>Demographics</u>						
Age	16.64	1.05				
Male	67.36%					
Race						
Hispanic	45.08%					
White	44.56%					
Other	10.36%					
<u>Teen Substance Use, Past 30 Days</u>						
Alcohol use	2.51	1.61	2.57	1.54		
Heavy drinking	1.92	1.52	1.83	1.38		
Marijuana use	3.07	2.30	2.60	2.15		
<u>Parental Monitoring</u>						
Poor Family management	1.51	0.58	1.59	0.68	0.08	0.63
Family involvement	3.20	0.72	3.18	0.82	-0.02	0.78
<u>Family Structure^d</u>						
Nuclear family (live with Mom & Dad)			59.07%			
<u>Perceived Adult Substance Use^d</u>						
Alcohol >= 4 days/week			6.95%			
Any marijuana use			15.51%			
<u>Family Values</u>						
Familism	3.37	0.48	3.36	0.60	-0.02	0.62
Filial piety	3.65	0.51	3.66	0.53	-0.01	0.58
<u>Peer Influence^d</u>						
Time spent around teens that			2.88	0.89		
Time spent around teens that use alcohol			3.00	0.95		

Who the teen lived with was only measured at follow-up. For this reason we included the perceived adult use marijuana substance use and peer influence variables measured at follow-up as well.

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Table 2

Multivariable Models Assessing Parental Factor Influences on Teen Substance Use^a

Variable	Past 30 Day Alcohol Use		Past 30 Day Heavy Drinking		Past 30 Day Marijuana Use	
	Std Beta	Unstd. Beta(SE)	Std Beta	Unstd. Beta(SE)	Std Beta	Unstd. Beta(SE)
Parental Monitoring						
Poor Family management	0.17*	0.43(0.18)	0.21**	0.45(0.17)	0.10	0.36(0.26)
Family involvement	-0.04	-0.07(0.14)	-0.05	-0.09(0.13)	0.00	0.01(0.20)
Family Structure ^b						
Nuclear family (five with Mom & Dad)	-0.12*	-0.37(0.19)	-0.10	-0.29(0.18)	-0.04	-0.17(0.27)
Perceived Adult Substance						
Alcohol >= 4 days/week Use ^b	0.00	0.02(0.36)	0.03	0.18(0.35)	-0.05	-0.43(0.53)
Any marijuana use	0.16**	0.68(0.25)	0.14*	0.55(0.24)	0.19**	1.10(0.37)
Family Values						
Familism	-0.19**	-0.48(0.18)	-0.18*	-0.41(0.17)	-0.06	-0.22(0.26)
Filial piety	0.09	0.25(0.19)	0.04	0.10(0.18)	0.00	-0.00(0.28)
Fit Statistics						
R-Square	0.42		0.36		0.37	
Adjusted R-Square	0.38		0.31		0.33	
Durbin Watson D Statistic	2.10		2.02		1.87	

* p<0.05,

** p<0.01

^a All models control for reported baseline AOD use, age, an indicator for Hispanic/Latino/a, gender, intervention, and peer influence. Models run without peer influence yielded estimates similar in magnitude and significance.

^b Who the teen lived with was only measured at follow-up. For this reason we included the perceived adult substance use and peer influence variables measured at follow-up as well.