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The moderating effects of peer substance use on the family structure–adolescent substance use association: Quantity versus quality of parenting

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Abstract

This study examines the association between family structure and adolescent substance use, specifically focusing on the potential conditioning effects of the level of exposure to substance-using peers. Using data from a statewide study of Florida students, tobacco, alcohol, marijuana, and other illicit drug use was regressed on measures of family structure, exposure to deviant peers, family process variables (including supervision, attachment, and discipline), and an array of salient predictors of adolescent substance use. Logistic regression analyses revealed that the level of exposure to substance-using peers moderates the relationship between family structure and substance use for three of the four dependent variables. The core finding is that living with two natural parents serves as a protective factor against using tobacco, alcohol, or other illicit drugs, but only under conditions when exposure to deviant peers is lowest. Under conditions when exposure to deviant peers is highest, teens residing in a traditional two-parent family are most likely to report substance use. However, some evidence suggests that this latter finding may be due to differences in the duration of exposure to deviant peers. These findings reinforce the need to continue to explore how the quantity of parenting may provide additional protection against adolescent substance use beyond quality of parenting factors.

Keywords: Substance use; Moderators; Peer use; Family structure

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1. Introduction

The family and peer group have been identified as two of the most important elements in understanding adolescent substance use. While the results are not unequivocal, research has largely demonstrated that associating with peers who use illicit substances is one of the strongest predictors of adolescent substance use (Farrell & Hoffman, 1994; Hoffman & Cerbone, 2002; Kandel, 1996; White, 1998; Wills, Windle, & Cleary, 1998; Windle, 2000). Parental influences have also been found to be significant predictors of teen alcohol, tobacco, and drug use, including the nature of parental supervision and monitoring (Dishion, Capaldi, Spracklen, & Li, 1995; Forehand, Miller, Dutra, & Chance, 1997), the quality of parental–child attachment (Farrell & White, 1998; Hawkins, Catalano, & Miller, 1992), and the history of parental substance use (Conway, Swendsen, & Merikangas, 2003; Heath et al., 1997; Kandel & Wu, 1995; Windle, 2000).

In addition to the direct associations that peer and parenting factors have with adolescent substance use, recent research has explored whether there exist mediating or moderating effects between the two sets of factors. Indeed, some evidence exists that controlling for peer use does mediate the association between adolescent peer use and related family process variables, such as parental attachment, discipline, and supervision (Aseltine, 1995; Miller, 1997). Some have interpreted this mediation effect as evidence that peer influences are part of an intervening chain of relations that stem from differences in family processes (e.g., supervision, discipline, parental attachment), which ultimately increase the risk of adolescent substance use (Brook, Brook, Scovell, Whiteman & Cohen, 1990; Hoffman, 1994; Kandel, 1996). In fact, some research suggests that the quality of parenting predicts the level of exposure to delinquent friends—the stronger the quality of parenting, the less likely the teen is to have access to deviant peers or to select them as friends (Patterson & Dishion, 1985; Urberg, Luo, Pilgrim, & Degirmencioglu, 2003). Indeed, research into factors predicting the selection of substance-using peers suggests that parental quality factors may exert their strongest influence in determining whether (or not) a teen selects substance–using peers as friends (Urberg et al., 2003). Still, other research has found that when family process variables (such as parental attachment or parental supervision) are weak or attenuated, adolescents may be more susceptible to the influence of delinquent peers–the magnitude of the relationship between exposure to deviant peers and adolescent drug use may be greater under conditions of low-quality parenting (Dishion et al., 1995; Foshee & Baumann, 1992; Svenesson, 2003).

While research has explored the possible mediating and moderating effects of parental quality variables and peer use, relatively little research has explored the possible mediating and moderating effects of family *structure* and peer use. However, several studies have examined whether children reared in nontraditional families, such as single-parent and blended families (including step-parent families), are at an increased risk of substance use. Many of these studies have found that adolescents living in single-parent families are at a greater risk of substance use than are teens residing in traditional two-parent families (Ellickson, Tucker, Klein, & McGuigan, 2001; Hoffman & Johnson, 1998; Thomas, Farrell, & Barnes, 1996) and that adolescents living in blended families have very similar

probabilities of substance use compared to those living in single-parent families (Hoffman, 2002; Hoffman & Johnson, 1998).

The primary reason for there being a dearth of studies exploring the possible mediating and moderating effects of family structure and peer use is likely due to research that has suggested that the relationship between family structure and adolescent deviance and substance use is mediated by differences in parental quality: Children raised in single-parent families are posited to experience lower levels of supervision and discipline and have weaker attachments to their parent than do children raised in traditional, mother/father families (Amato & Keith, 1991; Demuth & Brown, 2004; Hoffman, 1994). This research suggests that family structure is largely a marker for poor-quality parenting and that the latter factors are the critical determinants of teen substance use. In other words, family structure does not matter once other family variables are considered.

Indeed, the prevailing explanations of how and why family structure is associated with adolescent substance use reinforce the notion that family structure is a mere marker for other parenting variables. While family structure has been articulated to influence adolescent problem behavior in several ways, the major explanations proffered for why family structure is associated with adolescent substance focus on the following factors: resource deprivation, mobility, and parental attachment (Hoffman & Johnson, 1998). The most popular explanation centers on a resource deprivation argument—that single parents have fewer resources (including economic resources, time, energy) at their disposal than do two parents, with the assumption that fewer resources leads to diminished social control (Amato & Keith, 1991; Hirschi, 1969; McNulty & Bellair, 2003; Rankin & Wells, 1994). At the heart of this argument are differences in the supervision and discipline levels of parents—single parents would be less effective at supervising and disciplining their children than would be two-parent families because they have less time, energy, and 'one less set of eyes' to watch over their children. The "two is better than one" argument would likely not explain differences in risk levels for adolescents living in blended vs. traditional two-parent families, given the fact that there are two parents in residence and that there exists some evidence that the average income levels between the two types of family structures is roughly similar (McLanahan & Sandefur, 1994).

However, evidence also exists that stepfamilies *move* significantly more than either single-parent or traditional two-parent families do (McLanahan & Sandefur, 1994). Such relocation is likely a risk factor for substance use because of the resulting social isolation that often occurs for adolescents who are forced to move, dissolve friendships and peer networks, and experience weakened ties to school and community (Astone & McLanahan, 1994; Hoffman & Johnson, 1998). The *parental attachment* argument suggests that the nature of the emotional closeness between parent and child is weakened or attenuated in single-parent and blended families and that such a weakened bond between teen and parent(s) can serve to increase the risk of substance use by increasing the probability that the teen (a) will act on self-serving tendencies and (b) will choose to interact with peers that parents would typically disapprove of as friends (Hirschi, 1969; Hoffman, 1994). Some studies have found that children raised in single-parent families

have fewer opportunities for parental involvement than do children reared in traditional families (Amato, 1987; Hetherington, Cox, & Cox, 1982). However, other research suggests that the quality of the emotional bond between parent and child does not vary systematically by family structure (Hirschi, 1969). Indeed, Hirschi (1969) argued explicitly that family structure would be unrelated to adolescent deviance, "the one-parent family is virtually as efficient a delinquency controlling institution as the two-parent family" (p. 103).

Each of these arguments suggests that once family process variables (and/or mobility) are considered, the effect of family structure on adolescent substance use is attenuated. So why would exposure to substance-using peers interact with family structure to predict adolescent substance use, after controlling for quality of parenting variables? There exists some evidence to justify exploring such a hypothesis. Rankin and Kern (1994) found that a child from a single-parent family is at a greater risk of deviance than is a child from a two-parent family, even after controlling for quality of parenting. Their findings suggest that it is not simply the quality of the family process variables like attachment and supervision, but also the *quantity* of parents that predict delinquency. Rankin and Kern provide a social-control-based explanation for finding such a relationship between family structure and delinquency. They suggest that children with two parents have a greater stake in conformity (Briar & Piliavin, 1965), and therefore, the potential loss of affection from two parents will be more constraining than the loss of affection from one parent (if the child were to engage in delinquency). Using a social learning/differential association rationale (Akers, Krohn, Lanza-Kaduce, & Radosevich, 1979; Sutherland, 1947), Matsueda and Heimer (1987) suggested that living in "broken homes" hampered the effective socialization of children to avoid delinquent behavior, increasing the risk that a child will be exposed to 'an excess of prodelinquent definitions.' In other words, having one less parent likely translates to fewer lessons to avoid delinquency, and hence, children are more likely to be influenced by delinquent peers norms and values because these definitions are not counterbalanced in number by a single parent's definitions—one fewer positive role model may fail to negate the influence of deviant role models. However, this counterbalancing effect may only be successful under conditions when the child has few (or no) substance-using peers. Under conditions in which the child is exposed to relatively more substance-using peers, differences in the quantity of parenting would have little influence because the child would likely be exposed to an excess of prosubstance-using definitions.

Hence, two competing hypotheses can be extrapolated from social control and social learning theories regarding the role of deviant peers as a moderator of the relationship between family structure and substance use. Controlling for the quality of parenting variables, social control principles suggest that the number of substance-using peers would not moderate the relationship between family structure and adolescent substance use. However, social learning principles suggest that peer use would condition the relationship between family structure and adolescent substance use in such a manner that family structure serves as a protective factor only when the adolescent reports little exposure to peer using teens. When

adolescents report that most of their friends use drugs, the number of parents that the child resides with does not provide any protection against substance use.

The only published study to have directly explored the possible interaction effects of family structure and peer use in predicting adolescent substance use was Farrell and White's (1998) sample of 10th grade students across nine high schools. They failed to find a significant interaction effect between peer use and family structure in predicting drug use. However, their research was limited by both the unique qualities of the sample (over 90% of the sample was comprised of African-American students) and the lack of measures of parental quality variables, as well as other salient controls.

In the present study, the logic of the social control and social learning theories are extended to examine whether family structure interacts with peer use to predict adolescent substance use. Because there may also exist important differences between traditional two-parent families and so-called blended families, in such a way that the influence of the step or other nonnatural parent may not be as strong as the influence of natural parents, blended families are also considered in these analyses. To test this thesis, family process variables measuring parental attachment, supervision, and discipline must be controlled.

2. Data and methods

Data for this study are derived from the Florida Youth Substance Abuse Survey (FYSAS), administered during the 2000–2001 school year. FYSAS is an annual survey of Florida middle and high school students conducted by a multiagency workgroup that includes the Departments of Education, Health, Juvenile Justice, and Children and Families. Based on the work of Hawkins and Catalano's *Communities That Care Youth Survey* (CTCYS; Hawkins et al., 1992), the survey is designed to assess substance use behavior and salient family, school, peer, individual, and community risk and protective factors. A two-stage cluster sample was employed, in which groups of middle and high schools were randomly selected to participate, and then classrooms within each selected school were randomly selected. The study design was to produce a sample that was representative of county levels, which corresponds to each school district (67 total districts/counties) in the state. However, some school districts either did not participate in the survey, did not sample all high school and middle school grades, or did not produce enough surveys to provide representative sample, reducing the number of school districts included to 53. In the present analyses, only respondents who reported complete grade level and gender information and who provided information about substance use were included in the study. A STATA 8.0 regression procedure to impute missing values was employed for cases with missing data for the predictors (excluding race, gender, and grade level); none of the cases with missing data on the dependent variable were included in the analyses, however. Because there are four different dependent variables considered in the analyses, this produced a sample of 54,238 students for the tobacco use model, 52,278 students for the alcohol use model, 51,262 students for the marijuana use model, and 53,554 students for the other illicit drug use model. The survey data were weighted to adjust for deviations from the representativeness of the sample from its corresponding population. A

comprehensive discussion of the methodology of the survey, including the sampling plan and weighting strategy, is available in the 2000 FYSAS State Reports (Florida Department of Education, 2001).

2.1. Dependent variable

Four dependent variables are considered: tobacco, alcohol, marijuana, and other illicit substance use. Each of these variables is a dichotomous measure, capturing whether the respondent reported using (or not using) those substances in the past month. Included in the other illicit substance use category are the following substances: inhalants, Ecstasy, Rohypnol, LSD, PCP, hallucinogenic mushrooms, GHB, ketamine, methamphetamine, cocaine (including crack cocaine), depressants, heroin, OxyContin, Vicodin, Davocet (without a doctor's orders), amphetamines, or steroids. Respondents reporting use of any of these substances were coded as 1 for this variable, otherwise, the response was coded a zero.

2.2. Independent variables

Family structure is indicated by a set of dummy variables. The possible categories are single-parent and blended families (step-parent families and other family arrangements)—a respondent living with two parents is the reference category. In addition to family structure, an array of family process variables and other family factors are considered to reduce concerns about model misspecification.[1] Included among these variables are the following: family substance use, parental supervision, parental discipline, family attachment, parental education, and mobility. Each of these family factors has been found to be salient predictors of adolescent substance use (Brook et al., 1990; Ellickson & Morton, 1999; Vakalahi, 2002). *Parental substance use* is a three-item scale comprised of answers to the following questions: (a) Has anyone in your family ever had a severe alcohol or drug problem? (b) About how many adults have you known personally who in the past year have used marijuana, crack, cocaine, or other drugs? (c) gotten drunk or high? Higher scores represent greater parental substance use (Cronbach's α=.71). The mean is 3.01, with a standard deviation of 2.13. *Parental supervision* is a six-item scale comprised of answers to the following questions: (a) My parents ask if I have got my homework done. (b) My parents want me to call if I am going to be late getting home. (c) Would your parents know if you did not come home on time? (d) When I am at home, one of my parents knows where I am and who I am with. (e) The rules in my family are clear. (f) My family has clear rules about alcohol and drug use. Higher scores indicate lower family supervision (Cronbach's α=.68). The mean is 0.73 and the standard deviation is 0.59. *Parental discipline* is measured by a

[1] The scales used in these analyses were originally developed for the Communities that Care Youth Survey (see Hawkins et al., 1992, for a comprehensive discussion). A recent analysis of the psychometric properties of the scales reported that the factor structures of these scales were coherent, reliability averaged about .78 across the scales, and the scales were strongly correlated with the problem behaviors (Arthur, Hawkins, Pollard, Catalano, & Baglioni, 2002).

three-item scale comprised of answers to the following questions: (a) If you drank some beer or wine or liquor without your parents' permission, would you be caught by your parents? (b) If you skipped school would you be caught by your parents? (c) If you carried a handgun without your parents' permission, would you be caught by your parents? Higher scores indicate lower family discipline (Cronbach's α=.84). The mean is 1.21 and the standard deviation is .96. *Parental attachment* is measured as a four-item scale comprised of answers to the following questions. (a) Do you feel very close to your mother? (b) Do you share your thoughts and feelings with your mother? (c) Do you feel very close to your father? (d) Do you share your thoughts and feelings with your father? Higher scores indicate greater parental attachment (Cronbach's α=.74).[2] The mean is 1.86 and the standard deviation is .75. *Parental education* is captured as the highest reported schooling for the more educated parent (if respondent lives with two parents, otherwise, the education for one parent), ranging from grade school or less to graduate/professional school. Finally, *mobility* is measured by a four-item scale that comprise of answers to the following questions: (a) have you changed homes in the past year? (b) How many times have you changed homes since kindergarten? (c) Have you changed schools in the past year? (d) How many times have you changed school since kindergarten? Higher scores indicate greater history of mobility (Cronbach's α=.67). The mean is 1.49 with a standard deviation of 1.02.

The other variable of emphasis in these analyses, peer use, is captured by a four-item scale comprised of answers to the following questions (preceded by the instruction to the respondent to think about your four best friends): (a) In the past year, how many of your best friends have smoked cigarettes? (b) In the past year, how many of your best friends have tired beer, wine, or hard liquor when their parents did not know about it? (c) In the past year, how many of your best friends have used marijuana? (d) In the past year, how many of your best friends have used LSD, cocaine, amphetamines, or other illegal drugs? Higher scores on the peer use scale indicate greater exposure to substance-using peers (Cronbach's α=.84). The mean is 1.04 with a standard deviation of 1.12.

In addition to the variables of emphasis, an array of established risk and protective factors are included in these analyses as control variables. The respondent's perceived level of *neighborhood attachment* (Cronbach's α=.89) and the level of *community disorganization* (i.e., the extent to which communities are integrated and coordinated in their efforts to socialize children and solve community problems; Cronbach's α=.80) have been found to associated with a variety of social problems, including juvenile substance use (Bell, Carlson, & Richard, 1998). The means for these three-item scales of neighborhood attachment and community disorganization are 1.01 and 0.55, respectively, while the standard deviations are 0.93 and 0.58, respectively. *School failure* (Cronbach's α=.58) and level of *school commitment* (Cronbach's α=.76) are established predictors of substance use (Sutherland & Shepherd, 2001). The mean and standard deviation for the three-item scale measuring school failure is 1.05 and 0.62, respectively, while the mean and the standard deviation for the four-

[2] Parallel analyses decomposing parental attachment into mother and father attachment revealed similar findings to those reported in this study. Furthermore, because of the high correlation between the two scales, the inclusion of both subscales separately increased collinearity in the model.

item scale capturing level of school commitment is 1.38 and 0.66, respectively. Finally, gender, race and ethnicity, and grade of school are also included in the analyses because of their established associations with adolescent substance use (Ellickson & Morton, 1999; Hawkins et al., 1992).

2.3. Analysis strategy

The analysis began with a comparison of the mean levels for each of the pertinent variables, organized by family structure (single-, blended, and two-parent families). Scheffe's test of significant differences was used to determine whether the group means are statistically significant. Next, a series of multiple logistic regressions were conducted to evaluate both the main and interactive effects of peer use and family structure on the dichotomous measures of substance use. Both the descriptive statistical analyses and the multiple logistic regressions were conducted using STATA 8.0 software (Stata, 2004). A STATA 8.0 procedure that utilizes a survey estimation method to correct for clustering of observations and unequal probability sampling procedures was utilized in the analysis of all of the models. Included in this estimation method is the calculation of Huber standard errors (Huber, 1967)—these standard errors are used to determine the significant predictors in the models analyzed ($p<.05$).

3. Results

Table 1 presents the means on selected variables organized by family structure. These results suggest that there exist significant differences across categories of family structure on virtually all of the family process variables and other salient factors that have been argued to be associated with substance use risk. As expected, adolescents living in two-parent families have mean levels that suggest the lowest risk for substance use: Teens living in such families have the lowest perceived levels of community disorganization, have the lowest levels of family mobility, have the highest levels of parental supervision, the lowest levels of poor grades (school failure) and low school commitment, and the lowest mean levels of parental and peer substance use. However, such differences in mean levels of risk and protective factors do not appear from these analyses to produce radically different risks for adolescent alcohol or marijuana use. The only marked difference between average substance use across categories of family structure is found when examining the prevalence rates for tobacco use and other illicit drug use—in this case, teens residing in two-parent and reconstituted families are at a considerably lower risk of using such drugs compared with teens living in single-parent families.

Of particular interest in this study is the mean differences in exposure to peer using teens. As suggested by prior studies, family structure does appear to be significantly associated with exposure to substance-using teens, with teens from two-parent families having the lowest levels of exposure (0.90), adolescents from blended families having the greatest average level of exposure (1.27), and children living with single parents sandwiched in between (1.13). However, mean differences do not inform us about any possible interactive effect of these two factors.

Table 1
Mean scores on select variables for respondents residing in two-parent, single-parent, and blended families

	Two-parent families (A) (n=29,543)	Single-parent families (B) (n=15,172)	Blended families (C) (n=11,861)	Scheffe test of significant differences*
Parental education	3.73	3.70	3.30	A vs. C B vs. C
Neighborhood attachment	.85	1.05	1.36	A vs. B A vs. C B vs. C
Community disorganization	.38	.69	.79	A vs. B A vs. C B vs. C
Mobility	1.21	1.54	2.13	A vs. B A vs. C B vs. C
Low parental supervision	.61	.85	.88	A vs. B A vs. C B vs. C
Low parental discipline	1.12	1.47	1.10	A vs. B B vs. C
School failure	.86	1.29	1.20	A vs. B A vs. C B vs. C
School commitment	1.27	1.50	1.51	A vs. C A vs. B
Parental substance use	2.43	3.46	3.89	A vs. B A vs. C B vs. C
Peer use	.90	1.13	1.27	A vs. B A vs. C B vs. C
R's tobacco use	.10	.17	.10	A vs. B B vs. C
R's alcohol use	.24	.26	.23	A vs. B B vs. C
R's marijuana use	.16	.17	.22	A vs. B A vs. C B vs. C
R's other illicit drug use	.03	.14	.05	A vs. B A vs. C B vs. C

* $p<.05$, two-tailed test.

Logistic regression models predicting tobacco and alcohol use are analyzed, and their results are reported in Table 2. For the tobacco use models, all of significant predictors are in the expected direction, given past scholarship. Adolescents who are White (vs. Black or other racial group), who have weak attachments to the community, who have low levels of parental

Table 2
Logistic regression analysis of tobacco and alcohol use (95% CI in parentheses)

	Tobacco use (n=54,238)		Alcohol use (n=52,278)	
Grade	−.06	−.05	.13	.13*
	(−.19 to .08)	(−.17 to .07)	(.02 to .24)	(.02 to .24)
Gender	−.32	−.33*	.08	.09
	(−.65 to .02)	(−.64 to −.01)	(−.18 to .34)	(−.16 to .34)
Black	−1.58***	−1.60***	−1.31***	−1.28***
	(−2.23 to −.93)	(−2.24 to −.95)	(−1.87 to −.76)	(−1.83 to −.74)
Latino	−.24	−.25	.07	.07
	(−.63 to .15)	(−.62 to .12)	(−.18 to .31)	(−.17 to .31)
Other racial group	−.38**	−.34*	−.90***	−.89**
	(−.64 to −.11)	(−.61 to −.07)	(−1.40 to −.39)	(−1.39 to −.39)
Parental education	−.11	−.08	−.18***	−.17***
	(−.25 to .03)	(−.21 to .05)	(−.28 to −.08)	(−.26 to −.08)
Neighborhood attachment	−.48**	−.43**	.10	.10
	(−.77 to −.19)	(−.69 to −.16)	(−.10 to .30)	(−.09 to .29)
Community disorganization	−.08	−.10	.24	.20
	(−.41 to .25)	(−.40 to .20)	(−.03 to .51)	(−.07 to .46)
Mobility	−.07	−.06	−.16*	−.16*
	(−.19 to .05)	(−.18 to .07)	(−.29 to −.02)	(−.29 to −.02)
Low parental supervision	−.30	−.25	−.25	−.20
	(−.66 to .05)	(−.59 to .09)	(−.56 to .06)	(−.49 to .09)
Low parental discipline	.57***	.59***	.55***	.53***
	(.28 to .87)	(.32 to .86)	(.32 to .77)	(.31 to .74)
Low parental attachment	.02	.06	.08	.11
	(−.25 to .29)	(−.19 to .30)	(−.12 to .28)	(−.08 to .31)
Academic failure	.66***	.63***	−.05	−.04
	(.47 to .84)	(.47 to .79)	(−.22 to .12)	(−.20 to .12)
Low school commitment	.26*	.23*	.54***	.53***
	(.04 to .49)	(.04 to .42)	(.33 to .75)	(.32 to .73)
Parental substance use	.15**	.16***	.14**	.15**
	(.06 to .24)	(.07 to .24)	(.05 to .24)	(.06 to .24)
Peer substance use	1.29***	1.38***	1.16***	1.30***
	(1.11 to 1.48)	(1.13 to 1.62)	(.95 to 1.36)	(1.03 to 1.57)
Single-parent family	.46*	.14	−.16	−.09
	(.04 to .88)	(−.63 to .91)	(−.63 to .31)	(−.78 to .60)
Blended family	.03	1.25**	−.04	.62*
	(−.35 to .42)	(.51 to 1.99)	(−.39 to .31)	(.08 to 1.16)
Single-parent family× peer use		.13		− .07
		(−.29 to .55)		(−.36 to .23)
Blended family×peer use		−.57***		−.49***
		(−.86 to −.28)		(−.75 to −.23)
Constant	−5.29***	−5.68***	−3.91***	−4.18***
F	59.34	70.07	48.26	56.57

* p<.05 (two-tailed tests).
** p<.01 (two-tailed tests).
*** p<.001 (two-tailed tests).

discipline, who are doing poorly in school, who have weak commitment to schooling, and whose parents use substances are more likely to report having used tobacco in the past 30 days. Surprisingly, neither level of parental attachment nor parental supervision was found to be significant predictors of tobacco use, contrary to the predictions derived from the social control theory. Finally, peer use is found to be a powerful predictor of tobacco use, as expected.

With regard to the family-structure variables, the model without the interaction terms reveals that residing in a single-parent family serves as a significant risk factor for predicting tobacco use (vs. living in a family with two parents present). However, this model does not test whether family structure interacts with peer use to predict adolescent substance use. A visual inspection of the model with the interaction terms included reveals a more complex picture of the interaction between substance-using peers, family structure, and adolescent tobacco use. The findings reveal that there exists a significant interaction between living in a blended family and substance-using peers, such that the importance of family structure differs depending upon the level of exposure to substance-using peers. Under conditions in which the adolescent has little or no exposure to substance-using peers, living in a blended family is a significant risk factor for tobacco use (relative to living in a traditional two-parent family). However, as the level of exposure to substance-using peers increases, the protective effect of living in a traditional two-parent family dissipates. Indeed, if the child reports a relatively high level of exposure to deviant peers, then the relationship between family structure and tobacco use turns. Under conditions of high level of exposure to deviant peers, living in a traditional two-parent family appears to be a risk factor for smoking tobacco. While somewhat perplexing, additional analyses (not reported) suggest that differences in mobility patterns may explain this finding; under conditions of relatively low mobility, residing in a blended family does not provide a protection against tobacco use (relative to traditional two-parent families). Although conjecture, it may be the case that relatively high levels of exposure to substance-using peers has a greater effect on teens living in traditional than in blended families because these adolescents have known these teens *longer* than the typical teen from a blended family. Unfortunately, the data in this study have no measure of the duration of the association between the adolescent and peer using teens, which is an important component of the differential association theory (Sutherland, 1947): The longer an association between peers, the more influence their definitions have on forming the definitions of the adolescent.

For the alcohol use models, most of the predictors are, again, statistically significant in the expected direction, given prior research. Older adolescents, Whites (relative to Blacks and members of other racial groups), and those with a relatively lower level of commitment to school are at greater risk of alcohol use. Of the family process variables, only parental discipline was found to be a significant predictor of the dependent variable in the expected manner, although two additional family factors, parental education level and parental substance use, were also found to be associated with alcohol use. Teens with lower levels of parental discipline, whose parents are less educated, and who live in families with a greater level of exposure to adult substance users are at an increased risk to use alcohol. Peer use is

found to be a powerful predictor of alcohol use, consistent with prior research (Aseltine, 1995).

The results also indicate that family structure is associated with alcohol use, but only under certain levels of exposure to substance-using peers (i.e., the model containing interactions). Similar to the pattern revealed with tobacco use, under conditions of low exposure to deviant peers, living in a blended family is a modest risk factor for alcohol use. However, exposure to relatively higher levels of substance-using peers again reverses the importance of family structure, such that teens reporting greater levels of exposure to substance-using peers are more likely to use alcohol if they reside in traditional, two-parent families, relative to blended families. Again, additional analyses reveal that this interaction is significant under conditions of low mobility, again suggesting that the duration of the association with deviant peers may play an important role.

Table 3 presents the results of logistic regression analyses of the models predicting marijuana and other illicit drug use. With regard to marijuana use, many of the same predictors that were found to be significant predictors of alcohol and tobacco use are also found to be statistically significant predictors of this dependent variable—students with a lower level of attachment to their neighborhood and lower commitment to school, Whites (relative to all other groups, however), those whose parents are less educated, who have not moved much, who perform poorly in school, and older students are at a greater risk of marijuana use. Additionally, males are more likely to use marijuana than females are. Of the family process variables, parental discipline, parental attachment, and parental substance use are each found to be associated with marijuana use (students living in families with lower levels of discipline and attachment to parents, and those living with parents who themselves are substance users are at greatest risk of marijuana use). However, the level of parental supervision was found to be a significant predictor of marijuana use in the opposite direction than expected—teens reporting greater levels of supervision are more likely to use marijuana. This may be, however, a temporal order issue—teens using marijuana may lead to increased levels of supervision as a result of their problem behavior. Again, peer substance use is found to be a strong predictor of marijuana use.

Controlling for family process and other salient predictors, these results reveal that family structure is *not* a significant predictor of marijuana use—there exists no support that family structure is associated with marijuana use, either overall or under different conditions of exposure to substance-using peers (model with the interaction terms). For marijuana use, then, the quantity of parents is not significant once the quality of parenting and exposure to deviant peers are considered.

Compared with the pattern of findings in the prior models, the findings revealed in the analysis of predictors of other illicit drug use are of somewhat disparate. Relatively fewer factors are found to be significant predictors of such drug use. These results reveal that males, Whites, and students doing poorly in school and little commitment to school are at greatest risk of other illicit drug use. None of the family process variables are predictive of such substance use, although parental substance use was identified as a risk factor. Again, peer use was found to be a strong predictor of illicit drug use other than marijuana and alcohol.

Table 3
Logistic regression analysis of marijuana and other illicit drug use (95% CI in parentheses)

	Marijuana use (n=51,262)		Other illicit drug use (n=53,554)	
Grade	.20**	.19**	−.08	−.10
	(.08 to .31)	(.08 to .31)	(−.23 to .06)	(−.22 to .02)
Gender	.57**	.57**	.76***	.65***
	(.23 to .92)	(.24 to .90)	(.35 to 1.16)	(.29 to 1.01)
Black	−1.22***	−1.21***	−1.01**	−.85*
	(−1.71 to −.72)	(−1.70 to −.72)	(−1.72 to −.29)	(−1.51 to −.19)
Latino	−1.20***	−1.20***	.10	.17
	(−1.74 to −.65)	(−1.74 to −.65)	(−.25 to .45)	(−.17 to .50)
Other racial group	−.93***	−.92***	−.25	−.05
	(−1.39 to −.46)	(−1.38 to −.46)	(−.58 to .09)	(−.36 to .26)
Parental education	−.19*	−.19*	.01	.03
	(−.34 to −.04)	(−.33 to −.04)	(−.12 to .13)	(−.08 to .14)
Neighborhood attachment	.40*	.39*	−.28*	−.19
	(.04 to .75)	(.06 to .73)	(−.52 to −.04)	(−.40 to .03)
Community disorganization	.27	.27	.16	.20
	(−.13 to .67)	(−.13 to .68)	(−.10 to .43)	(−.04 to .45)
Mobility	−.19**	−.19*	−.13*	−.12
	(−.34 to −.03)	(−.34 to −.04)	(−.25 to −.004)	(−.24 to .003)
Low parental supervision	−.79***	−.80***	−.05	.08
	(−1.18 to −.40)	(−1.19 to −.40)	(−.51 to .40)	(−.33 to .48)
Low parental discipline	.63***	.64***	−.28	−.11
	(.34 to .92)	(.36 to .91)	(−.67 to .12)	(−.43 to .22)
Low parental attachment	−.44**	−.44**	−.25	−.15
	(−.69 to −.18)	(−.70 to −.17)	(−.53 to .04)	(−.39 to .10)
Academic failure	.28***	.28***	.41***	.36***
	(.15 to .42)	(.15 to .42)	(.21 to .61)	(.17 to .54)
Low school commitment	.26**	.26**	.79***	.69***
	(.08 to .44)	(.09 to .42)	(.52 to 1.05)	(.47 to .91)
Parental substance use	.21**	.21**	.19***	.22***
	(.08 to .33)	(.08 to .33)	(.11 to .26)	(.13 to .30)
Peer substance use	1.51***	1.49***	.97***	.58***
	(1.30 to 1.72)	(1.25 to 1.72)	(.77 to 1.17)	(.37 to .78)
Single-parent family	−.40	−.49	1.13***	−1.10*
	(−.93 to .13)	(−1.26 to .27)	(.61 to 1.64)	(−1.99 to −.22)
Blended family	.04	−.06	.23	.38
	(−.33 to .41)	(−.79 to .68)	(−.16 to .62)	(−.27 to 1.03)
Single-parent family×peer use		.04		.94***
		(−.31 to .40)		(.46 to 1.42)
Blended family×peer use		.05		−.06
		(−.36 to .45)		(−.31 to .18)
Constant	−5.59***	−5.54***	−6.32***	−6.02***
F	53.40	48.95	34.70	33.63

* p<.05 (two-tailed tests).
** p<.01 (two-tailed tests).
*** p<.001 (two-tailed tests).

With regard to family structure, the analyzed model without the interaction terms reveals that residing in a single-parent family is a risk factor for such illicit drug use, relative to living in two-parent families. However, once the interaction terms are considered, it is revealed that the level of exposure to deviant peers conditions the relationship between family structure and other illicit drug use, but in a somewhat different fashion than the earlier findings reveal. When a teen reports having little exposure to deviant peers, living in a single-parent family actually serves as a protective factor (relative to living in two-parent families). However, teens reporting having relatively high levels of exposure to deviant peers are actually at an increased risk of being involved in other illicit drug use if they reside in a single-parent family (instead of living with two parents).

4. Discussion

The present study examined the relationships among peer use, family structure, and adolescent substance use for a sample of Florida public middle and high school students. Teens from nontraditional families are more likely to report using tobacco, alcohol, marijuana, and other illicit drugs than are teens who reside with both of their natural parents. As expected, peer use is a strong predictor of adolescent substance use, consistent with prior research (Farrell & Hoffman, 1994; Hoffman & Cerbone, 2002; Kandel, 1996; White, 1998; Wills et al., 1998; Windle, 2000).

The findings suggest that family structure is a significant predictor of adolescent substance use, even after controlling for family process variables and other factors. However, the level of exposure to substance-using peers appears to condition the association between family structure and adolescent substance use, although not in as straightforward of a manner as would be predicted by either social control or social learning theory. It was hypothesized that family structure, or the quantity of parents in an adolescent's life, would serve as a protective factor against substance use under conditions in which the teen had relatively low levels of exposure to deviant peers. Consistent with the differential association theory, one could expect that when teens are exposed to relatively few deviant peers, the number of prosocial (or antidrug) definitions that they would be exposed to would exceed the number of prodrug definitions that they experienced, if the teen had two sources (two parents) presenting such definitions. However, under conditions of relatively great exposure to deviant peers, family structure would not matter; teens would be exposed to an excess of definitions favorable to substance use from their contact with substance-using peers, and the protective effects of having two sources (i.e., two parents) of prosocial definitions would be outweighed by the number of prodrug definitions presented by peers.

While the findings did reveal that the exposure level to substance-using peers conditioned the relationship between family structure and substance use for three of the four dependent variables (tobacco, alcohol, and other illicit drug use), the conditioning effect was not quite what was expected. In only one of four models (illicit drug use model) was the important contrast between two- and single-parent families shown. In both the alcohol and tobacco use models, the conditioning influence of the exposure level to deviant peers was the difference in

risk of substance use between traditional two-parent and blended families. In all three of these models, however, the conditional relationship between family structure and risk of adolescent substance use was similar: Under conditions of low exposure to deviant peers, residing with both natural parents appears to be a protective factor against substance use. However, under conditions of relatively high exposure to substance-using peers, teens residing in two-natural-parent families are more likely to use drugs (relative to living a blended family for alcohol and tobacco use and living in a single-parent family for other illicit drug use). Additional analyses, however, suggest that the finding that teens living in traditional two-parent families have the highest probability of substance use when exposure to substance-using peers may be related to the duration of exposure to deviant peers because of significant differences in the mobility of nontraditional two-parent families. Teens living in nontraditional families are frequently moving and changing schools, and thus, the nature of their exposure to deviant peers may be similar in number but not similar in terms of familiarity. Thus, the effect of peer exposure may be stronger because the teen living in a traditional two-parent family has known his friends longer than a typical teen living in blended families. However, it is clear that additional research is needed to clarify the conditional nature of this relationship.

While these findings provide qualified support for the notion that family structure matters under conditions of low exposure to deviant peers, there are some obvious limitations that must be considered. First, because of the limited nature of the data, the question of whether family structure is an important predictor of the *selection* of peers who use substances is not considered in these analyses (see Kandel, 1996, for a comprehensive discussion of this issue). The aforementioned lack of measures of the duration of association with deviant peers led to conjecture rather than direct evidence to explain the complicated conditioning effect of exposure to peers on the family structure–substance use association. Furthermore, the data included no measure of duration of time that a teen lived in a particular family structure—a teen experiencing a recent change in family structure may be more greatly influenced by peers relative to an adolescent who has had relative stability in their family configuration. Finally, data limitations prohibited the examination of reciprocal associations between some of the key variables in these analyses, such as substance use behavior leading to association with like peers (Ginsburg & Greenley, 1978).

Despite these limitations, this research suggests that family structure matters, albeit modestly and conditionally, even after controlling for the difference in parental quality variables. While speculative, one explanation for why family structure remained significant after controlling for parental quality variables is that, contrary to some prior studies (Aseltine, 1995; Miller, 1997), the relatively large sample size of the present study likely provided a sizable boost in power to detect significant associations. Nonetheless, and consistent with recent research on European adolescent substance use (McArdle et al., 2002), it appears that both the quantity and quality of parenting matters in predicting teen drug use. Additionally, the present study provides additional indirect support illuminating the importance of factors predicting selection of deviant peers (e.g., Kandel, 1996; Patterson & Dishion, 1985; Urberg et al., 2003). Factors that insulate or dissuade teens from initially selecting deviant peers may indeed be the crucial determinant in the process, which culminates in peer substance use. And

because these findings also revealed that teens raised in traditional two-parent families have significantly lower levels of exposure to deviant peers and better-quality parenting, it appears that living in a two-natural-parent family serves as a marker for the convergence of a number of important protective factors (Amato & Keith, 1991; Demuth & Brown, 2004; Hoffman, 1994). Finally, these findings suggest that additional research is necessary to more clearly understand why and how family structure is associated with substance use and how peers moderate the family structure–substance use relationship.

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