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## The Importance of Family Factors to Protect Against Substance Use Related Problems among Mexican Heritage and White Youth\*

Albert M. Kopak<sup>1,\*\*</sup>, Angela Chia-Chen Chen<sup>2</sup>, Steven A. Haas<sup>3</sup>, and Mary Rogers Gillmore<sup>4</sup>

<sup>1</sup>Department of Criminology and Criminal Justice, Western Carolina University, Cullowhee, NC, USA

<sup>2</sup>School of Nursing and Health Innovation, Arizona State University, Phoenix, AZ, USA

<sup>3</sup>Sociology Program, School of Social and Family Dynamics, Arizona State University, Tempe, AZ, USA

<sup>4</sup>School of Social Work, Arizona State University, Phoenix, AZ, USA

### Abstract

**INTRODUCTION**—This study examined the ability of family cohesion, parental control, and parent-child attachment to prevent adolescents with a history of drug or alcohol use from experiencing subsequent problems related to their use.

**METHODS**—Data came from Wave I and Wave II of the National Longitudinal Study of Adolescent Health and included Mexican heritage and White adolescents who reported alcohol use ( $n = 4,894$ , 25% prevalence) or any other drug use ( $n = 2,875$ , 14% prevalence) in their lifetime.

**RESULTS**—Logistic regression results indicate greater parent-child attachment predicted lower risk of experiencing drug use problems (OR = 0.87, 95% CI = 0.77 – 0.98) while stronger family cohesion predicted lower odds of experiencing drug- (OR = 0.82, 95% CI = 0.70 – 0.97) or alcohol-related (OR = 0.74, 95% CI = 0.65 – 0.84) problems. Parental control was also negatively associated with odds of problems related to drug use (OR = 0.93, 95% CI = 0.86 – 0.99) or alcohol use (OR = 0.94, 95% CI = 0.90 – 0.99). Results also indicated family cohesion was the only protective factor for Mexican heritage youth while family cohesion and parent-child attachment were protective among White youth. Parental control protected White female adolescents from

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\*\*Please address all correspondence to: Albert Kopak, Department of Criminology and Criminal Justice, Belk 106, Western Carolina University, Cullowhee, NC 28723, Ph: (828) 227-2328. Fax: (828) 227 - 7705. amkopak@wcu.edu.

### Contributors

Albert M. Kopak took primary responsibility for writing this article and undertook the statistical analyses. Angela Chia-Chen Chen conceptualized the study, supervised all aspects of its implementation, and contributed to the writing. Mary Rogers Gillmore contributed to study conceptualization and offered significant editorial input. Steven A. Haas contributed to study conceptualization and to the statistical analyses. All authors contributed to and have approved the final manuscript.

### Conflict of Interest

All authors declare they have no conflicts of interest.

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drug use problems more than males. Mexican heritage male adolescents experienced more protection from drug problems compared to females.

**CONCLUSION**—Findings highlight the need for prevention interventions to emphasize parent-child attachment for White youth and family cohesion for both Mexican-heritage and White youth to decrease adolescent substance users' drug- and alcohol-related problems.

### Keywords

Adolescent; family factors; drug use; drug problem; Latino; White

## 1. Introduction

Recent estimates show 16% of the U.S. population, which equates to 50.5 million people, self-identify as Hispanic or Latino. Approximately 63% or 31.8 million of those were either born in Mexico or trace their ancestry to Mexico and self-identify as Mexican (Ennis et al., 2011). In addition to comprising the largest proportion of the Latino population, those who have Mexican heritage are also substantially younger than the general U.S. population with a median age of 25 years compared to 36 years (Dockterman, 2011).

Recent prevalence reports indicate the rapidly growing and youthful Latino population in the U.S. has high rates of substance use during adolescence similar to those among White youth. For example, approximately 33% of Latino youth and 28% of White youth in the tenth grade have used an illicit drug in the past year (Johnston et al., 2010). A similar pattern has emerged for alcohol use; approximately 34% of tenth grade Latino youth and 32% of White youth have used alcohol in the past 30 days. These high levels of illicit drug and alcohol use are causes for concern because substance use during adolescence can lead to heavier substance use and the potential for abuse later in life (Anthony and Petronis, 1995; Chen et al., 2009; McGue and Iacono, 2008; Schmid et al., 2007; Wittchen et al., 2008). Empirical evidence indicates substance abuse may also lead to longer periods of unemployment (Hoffman et al., 2007), physical health problems (Kandel et al., 1986; Keaney et al., 2011), the dissolution of social relationships, and many other negative outcomes (Anderson et al., 2010). Given the higher prevalence of alcohol and other drug use among Latino and White youth compared to Asian and African American youth in the U.S., the rapid growth of the Latino population, and the potential for this use to contribute to behavioral problems, it is especially important to focus on these two racial/ethnic groups.

Most research focuses on the frequency of substance use; less is known about factors directly resulting from use, such as problems with work, school, relationships, or risky sexual behavior. That is, why do some youthful substance users experience such outcomes while others do not? The current study helps address this gap by examining whether family-based protective factors differentially reduce the likelihood of work, school, relationship, or other substance use-related behavioral problems from occurring among Mexican-heritage and White adolescents before these problems contribute to substance abuse and dependence.

Research has identified the family as a significant source of protection against drug and alcohol abuse among adolescents (Chen et al., 2010; Hawkins et al., 1992). Developing healthy family relationships can enhance the ability of parents to communicate prosocial norms to their children (Rankin and Kern, 1994), allowing parents to establish and enforce sanctions against adolescents' undesirable behaviors, such as substance use. Positive attachment to parents has consistently been identified as a protective factor against illicit drug and alcohol use among adolescents (Kostelecky, 2005; van der Vorst et al., 2006). In addition, research has shown that parents' attentiveness to adolescents' behavior and associations through various monitoring techniques can decrease substance use involvement

(Chapple et al., 2005; Coombs and Landsverk, 1988). Moreover, family based treatment programs, such as Multidimensional Family therapy (MDFT), focus on enhancing family relationships and have been successful in reducing juvenile delinquency and adolescent substance use and abuse (Liddle, 2010). Research has also shown MDFT to be a successful treatment program for adolescents from a variety of racial and ethnic backgrounds (Henderson et al., 2010), further demonstrating the effectiveness of strengthening the family to reduce substance use. Most research to date, however, has been conducted with relatively small samples and typically has not examined ethnic differences in the protective effects that the family may have against behavioral problems related to substance use among adolescents.

There is reason to believe that parent-child relations may be more protective against substance use for Latinos than White youth, given the traditionally high value that Latinos place on the family (De la Rosa, 2002; Szapocznik et al., 2007). Strong family bonds have been shown to protect Latino adolescents from substance use and engagement in deviant behaviors (Gil, Vega, and Dimas, 1994; Ramirez et al., 2004). For example, parental warmth and family cohesion have been found to exert a greater protective effect against Latino youths' substance use than for youth in other racial/ethnic groups (Broman et al., 2006; Vega et al., 1998). Ellickson and Morton (1999) found that Latino adolescents who sought parental help with their personal problems were less likely to engage in illicit drug use compared to those who did not. However, some studies have reported contradictory findings demonstrating a lack of ethnic differences in the protective effects of parental monitoring on early adolescent problem behaviors and substance use (Windle et al., 2010; Yabiku et al., 2010). Inconsistencies may be due to relatively small sample sizes, grouping of heterogeneous ethnic subgroups together (i.e. Puerto Rican, Mexican, and Cuban all treated as Latino), and low reliabilities of some family factor measures.

Latino family relationships may also vary by immigrant generation with family socialization practices becoming influenced by US culture and eventually diverging from the generally high degree of family warmth characteristic of traditional cultural values (Kwak, 2003). On the other hand, research has shown parental monitoring and family support to be similar between first and second generation Latino immigrant groups (Trejos-Castillo and Vazsonyi, 2009). Taken as a whole, the literature suggests that family factors are protective against substance use among both Latino and White youth, but the relationship may be stronger among Latino youth because of the stronger collectivistic orientation of Latino culture which emphasizes warm, close supportive family relationships that take precedence over the needs of the individual (Fuligni et al., 1999), and therefore may offer greater protection against adolescent risky behaviors.

Research also suggests ethnic differences in parenting and family practices may vary according to adolescents' gender, differentially influencing levels of substance use for adolescent girls and boys. According to Latino family-based cultural traditions adolescent girls are encouraged to stay close to the home and contribute to household care-taking activities while boys receive fewer restrictions giving them more freedom outside the home (Yabiku et al., 2010). This situation could foster much closer supervision and stronger ties to the family unit for Latina adolescents (Cota-Robles and Gamble, 2006), leading to less substance use among girls compared to boys.

The current study contributes to this literature with several unique characteristics. To the best of our knowledge, this is the first study to examine family and parenting factors as they relate to drug- and alcohol-related problems among adolescents who have initiated alcohol and/or drug use. To address this gap, this study examines the association of three family factors that have been previously identified as protective against problem behaviors with the

likelihood of problems related to drug- or alcohol use among adolescents who have initiated substance use. Research to date has offered valuable insights related to protective factors against substance use among Latino youth, but owing to small sample sizes, many of these studies have found it necessary to combine subgroups with different cultures and immigration histories that may affect their substance use patterns (e.g., adolescents of Puerto Rican, Cuban, Salvadoran, Honduran, Mexican descent, etc. are often combined into a single heterogeneous group labeled “Hispanic” or “Latino”). We focus on Mexican-heritage adolescents, the largest Latino group in the U.S., to avoid ambiguities that can stem from combining ethnic subgroups. We use longitudinal data from a large nationally representative sample to examine the relationship between three key family variables (parent-child attachment, family cohesion, parental control) and work, school, relationship, or other substance use-related behavioral problems related to drug and alcohol use among Mexican heritage and White adolescents.

Based on prior empirical findings, we hypothesize that (1) parent-child attachment, family cohesion, and parental control will be negatively associated with the likelihood of experiencing problems related to alcohol and drug use for both Mexican heritage and White adolescents; (2) the effects of the three family variables will be more protective for Mexican heritage youth compared to White youth, and (3) more protective for females compared to males in both racial/ethnic groups.

## 2. METHODS

### 2.1. Background

Data for the current study were collected as part of the National Longitudinal Study of Adolescent Health (Add Health), a nationally representative, school-based study examining health-related and risk behaviors among 90,118 adolescents in grades 7–12 at Wave I (Mullan et al., 2008). Schools included for data collection provided rosters of all students enrolled. From these rosters, a sample of 20,745 adolescents was drawn to complete in-depth interviews at home. The analyses presented here used data collected from in-home interviews with youth collected at Waves I (1994–1995) and II (1996). After obtaining written informed consent from parents or guardians and adolescents, an interviewer-assisted questionnaire was administered to adolescents. Interviewers read non-sensitive questions to the adolescents and entered responses directly on a computer. For sensitive questions, adolescents listened to pre-recorded questions via earphones and entered their responses directly on a computer to help ensure confidentiality. Participants in the Wave II sample are the same as those who were interviewed at Wave I, except for those who were disabled ( $n = 957$ ) or were in grade 12 ( $n = 3,356$ ). A detailed description of the sampling design is available on the study website (<http://www.cpc.unc.edu/projects/addhealth/design>). The current study was approved by our university’s Institutional Review Board.

### 2.2. Sample

Youth who reported having drunk beer, wine, or liquor more than two or three times in their lives at either Wave I or Wave II were included in the subgroup of alcohol users. This subgroup included 619 (13%) Mexican heritage (including immigrant and US-born youth) and 4,275 (87%) White adolescents. Youth who reported having used any of the following drugs at either Wave I or II were included in the drug use subgroup: marijuana, cocaine, inhalants, LSD, PCP, ecstasy, mushrooms, speed, ice, heroin, pills without a doctor’s prescription, or they injected a drug such as heroin. This subgroup included 414 (14%) Mexican heritage (including immigrant and US-born youth) and 2,461 (86%) White adolescents. Of the 619 Mexican heritage adolescents, 61% reported having used both alcohol and drugs as did 53% of the White youth; these youth were included in both

subgroups. Interviewers read questions in Spanish to 12% ( $n = 73$ ) of Mexican heritage adolescents in the alcohol user sample and to 9% ( $n = 37$ ) of Mexican heritage adolescents in the drug user sample. Table 1 displays the sociodemographic characteristics of the sample.

## 2.3. Measures

**2.3.1. Substance use problems**—Two dependent variables, alcohol-related problems and drug-related problems were assessed at Wave II. *Alcohol-related problems* included 7 items beginning with the question, “Over the past 12 months, how many times has each of the following things happened?” followed by, (1) “You had problems with your friends because you had been drinking,” (2) “You had problems at school or with school work because you had been drinking,” (3) “Did you get into a sexual situation that you later regretted because you had been drinking,” (4) “You got into trouble with your parents because you had been drinking,” (5) “You were hung over,” (6) “You were sick to your stomach or threw up after drinking,” and (7) “Did you get into a physical fight because you had been drinking.” Responses were coded to indicate whether participants experienced any of these alcohol-related problems (coded ‘1’) or did not experience any alcohol-related problems (coded ‘0’). *Drug-related problems* was assessed with three questions asking participants if they had, (1) “Driven while high on drugs,” (2) “Been high on drugs at school,” and whether they had (3) “Gotten into a fight while they had been using drugs” in the period since the Wave I interview. A binary indicator was created of whether participants experienced any of these drug-related problems (coded “1”) or none of them (coded “0”).

**2.3.2 Family variables**—Three family variables were assessed at Wave I (see Supplementary Material for a complete list of items)<sup>1</sup>. *Parent-child attachment* assessed adolescents’ feelings about their relationship with their parents with three questions such as, “Overall, you are satisfied with your relationship with your mother/father,” “Most of the time your mother/father is warm and loving toward you.” Each item was scored on a 5-point scale ranging from 1 = ‘strongly disagree’ to 5 = ‘strongly agree.’ Responses to the three items were averaged to form the score; higher scores represent greater attachment between parents and adolescents ( $\alpha = .84$  for the aggregate and White samples, and  $\alpha = .85$  for the Mexican heritage sample). *Family cohesion* was based on four items that assessed the extent to which adolescents’ felt that family members enjoy, love, and care about one another. The questions began with the item “How much do you feel that...” followed by items such as, “your parents care about you” and “you and your family have fun together.” Each item was scored on a 5-point scale ranging from 1 = ‘not at all’ to 5 = ‘very much.’ The mean of the four items was used as the measure; higher values represent stronger ties between the adolescent and their family ( $\alpha = .75$  for the aggregate and White samples, and  $\alpha = .74$  for the Mexican heritage sample). *Parental control* was assessed with seven items that tapped the extent to which adolescents’ believed their parents set rules and monitored their behavior. The items began with the statement “Do your parents let you make your own decisions about...” followed by items such as “...the time you must be home on weekend nights” and “...the people you hang around with.” Each item was scored as a binary variable with 0 = ‘No’ and 1 = ‘Yes.’ The measure is a reverse score of the sum of the “yes” responses; higher values represent adolescent reports of less input regarding their decisions which translated to greater parental control ( $\alpha = .59$  for the aggregate sample,  $\alpha = .58$  for the White sample, and  $\alpha = .60$  for the Mexican heritage sample).

<sup>1</sup>Measurement of family variables can be found by accessing the online version of this paper at <http://dx.doi.org> and by entering doi: ...

**2.3.3. Demographics**—*Race/ethnicity* included “Mexican heritage,” coded ‘1,’ and refers to adolescents who self-reported being Latino with Mexican background. “White” refers to adolescents that self-reported being non-Latino White (coded ‘0’). *Gender* was measured as self-reported male (coded ‘0’) or female (coded ‘1’). Family structure, which is likely to be related to family factors, parenting practices, and substance use problems (McArdle et al, 2002), was assessed with a binary variable. Single parent families were coded ‘0’ and two-parent families were coded ‘1.’ Adolescents’ academic performance has also been associated with substance use problems and family dynamics (Hawkins et al., 1992). Adolescents’ self-reported grade point average (GPA) was calculated as a mean of four items asking for their most recent grades in (a) English or language arts, (b) mathematics, (c) history or social studies, and (d) science. Responses range from 1 = ‘D or lower’ to 4 = ‘A.’ Parents’ highest level of education, a proxy for socioeconomic status, was dummy coded into three categories; ‘less than high school completion,’ ‘completed high school,’ and ‘formal education beyond high school.’ Less than high school completion was treated as the reference group. A continuous measure of age, calculated according to adolescents’ birth date, was included as a control to address the variability of age in the sample and the likely association between age and substance use problems (Chen and Kandel, 1995). Language use at home was included as a proxy for acculturation in the Mexican heritage sample. Youth who reported usually speaking English at home were coded ‘0’ and those who usually spoke Spanish were coded ‘1’. Mexican heritage adolescents’ nativity was also included. Adolescents born outside the US were coded ‘0’ and those born in the US were coded ‘1’. The measures of family structure, self-reported grades, parents’ education, and age were included as control variables for both groups. Language use and nativity were included as control variables for the Mexican heritage sample only.

## 2.4. Statistical Analyses

First we used *t*-tests to determine whether mean levels of the family variables were the same for Mexican heritage and White adolescents. We then conducted a logistic regression analysis to test our first hypothesis which examined whether these family variables predicted the probability of experiencing drug- or alcohol-related problems among all adolescents. We then examined our second and third hypotheses with logistic regression analyses to determine whether these family variables differentially predicted drug- and alcohol-related problems by racial/ethnic group and by gender.

## 3. Results

### 3.1. Descriptive analyses

Among alcohol users, the Mexican heritage adolescents were older ( $t = 4.99, p < .001$ ), reported lower GPAs ( $t = 8.17, p < .001$ ), and had higher levels of parental control ( $t = 6.39, p < .001$ ) than their White counterparts (Table 1). A greater proportion of Mexican heritage adolescents came from two-parent households compared to White youth ( $\chi^2 = 5.61, p = .018$ ), but smaller proportions of Mexican heritage youths’ parents had finished high school ( $\chi^2 = 7.32, p = .007$ ) or had education beyond high school ( $\chi^2 = 198.82, p = .000$ ) compared to White youths. The proportion of adolescents who experienced alcohol-related problems were similar in the Mexican heritage and White groups ( $\chi^2 = .002, p = 0.96$ ).

In the drug user subgroup (Table 1), a greater proportion of White youth had parents who had received education past high school compared to Mexican heritage youth ( $\chi^2 = 120.59, p = .000$ ). Mexican heritage adolescents also had lower GPAs ( $t = 6.97, p < .001$ ). In contrast, Mexican heritage youth reported higher levels of parental control ( $t = 4.73, p < .001$ ) and family cohesion ( $t = 2.31, p = .02$ ) compared to White youth. In contrast to alcohol

users, a greater proportion of White adolescents' reported problems related to drug use than the Mexican heritage adolescents ( $\chi^2 = 5.31, p = .02$ ).

### 3.2. Odds of experiencing alcohol- or drug-related problems in the aggregate sample of Mexican heritage and White youth

We first conducted a logistic regression analysis with the aggregate sample to estimate the main effects of the family variables, race/ethnicity, and gender (assessed at Wave I) on adolescents reports of alcohol- and drug-related problems (assessed at Wave II), controlling for sociodemographic variables and correcting for the Add Health sampling design. Results indicate that two of the three family variables were significantly associated with alcohol-related problems while all three were associated with drug-related problems (Table 2). In the alcohol using sample, our hypothesis was partially supported with greater family cohesion (OR = 0.74, 95% CI = 0.65 – 0.84) and greater parental control (OR = 0.94, 95% CI = 0.90 – 0.99) predicting reductions in the odds of alcohol-related problems. For the drug-using sample, greater parental control (OR = 0.93, 95% CI = 0.86 – 0.99), greater attachment to parents (OR = 0.87, 95% CI = 0.77 – 0.98), and greater family cohesion (OR = 0.82, 95% CI = 0.70 – 0.97) predicted lower odds of experiencing drug-related problems, as hypothesized. Neither gender nor race/ethnicity was related to alcohol- or drug-related problems.

Additional analyses were conducted to ascertain whether the shared variance between the family variables influenced the results in the model predicting alcohol-related problems given parent-child attachment approached significance. The weak correlation between parental control and parent-child attachment ( $r = .01$ ) suggested shared variance was not a concern between these two variables, but the correlation between parent-child attachment and family cohesion was stronger ( $r = .56$ ). When only parent-child attachment and the control variables were in the equation, parent-child attachment achieved significance (OR = 0.80, 95% CI = 0.74 – 0.87), but when family cohesion was entered into the equation, parent-child attachment became non-significant (OR = 0.92, 95% CI = 0.84 – 1.00), demonstrating family cohesion suppressed the effect of parent-child attachment.

### 3.3. Odds of experiencing alcohol- or drug-related problems within the Mexican heritage and the White samples

We also conducted logistic regression analyses to estimate the family variables' effects on alcohol- and drug-related problems within each racial/ethnic group. For alcohol-related problems (Table 3), the findings show that greater family cohesion was significantly associated with lower odds of experiencing alcohol-related problems in both the Mexican heritage (OR = 0.62, 95% CI = 0.41 – 0.93) and the White samples (OR = 0.75, 95% CI = 0.67 – 0.85), as hypothesized. However, parent-child attachment was significantly associated with White adolescents' alcohol-related problems (OR = 0.89, 95% CI = 0.81 – 0.99), but not Mexican heritage adolescents' alcohol-related problems (OR = 1.07, 95% CI = 0.84 – 1.36); thus only partially supporting our hypothesis. Contrary to our hypothesis, gender was not associated with alcohol-related problems in the White sample or in the Mexican heritage sample.

Fewer family variables significantly predicted drug-related problems than alcohol-related problems and the pattern varied by racial/ethnic group. Among Mexican heritage adolescents, family cohesion was the only family variable significantly and negatively associated with drug-related problems (OR = 0.62, 95% CI = 0.42 – 0.90) (Table 4), as hypothesized. In the White sample parent-child attachment was negatively associated with drug-related problems (OR = 0.85, 95% CI = 0.74 – 0.96).

### 3.4 Interaction of race/ethnicity and family factors, and gender and family factors, on alcohol- and drug related problems

Based on preliminary evidence for ethnic differences in the proportion of adolescents who reported drug-related problems and the results from the logistic regression models estimated within each ethnic group suggesting the possibility of significant between-group differences in the relationships between family factors and problems, we also tested the interaction of race/ethnicity with each of the three family variables. However, no statistically significant interaction effects predicting drug-related problems were found. We also tested whether the relationships between family factors and alcohol-related problems were significantly different between ethnic groups, but no statistically significant interactions were observed.

Significant bivariate correlations between the family variables and drug-related problems by gender within each ethnic group (e.g., Mexican males:  $r_{drug\ problems/family\ cohesion} = -.23, p < .001$ ; Mexican females:  $r_{drug\ problems/family\ cohesion} = -.05, p = .51$ ; White males:  $r_{drug\ problems/parental\ control} = -.02, p = .41$ ; White females:  $r_{drug\ problems/parental\ control} = -.10, p < .001$ ) prompted us to formally test whether gender interacted with each of the family variables using logistic regression models. There was one significant interaction within each ethnic group. In the Mexican heritage sample, the gender-family cohesion interaction was significant (OR = 2.77, 95% CI = 1.30 – 5.91) demonstrating Mexican heritage males experienced greater protection from family cohesion compared to females. In the White sample, the gender-parental control interaction was significant (OR = 0.87, 95% CI = 0.76 – 0.99) indicating parental control was more protective against drug-related problems for White females compared to males, which supported our hypothesis.

## 4. Discussion

### 4.1. Aggregate sample analyses

The findings suggest that certain family factors may help to reduce the likelihood of adolescents experiencing problems stemming from their substance use. In the aggregate sample, family cohesion, parent-child attachment, and parental control predicted a lower probability of experiencing problems related to drug use while family cohesion and parental control protected against alcohol-related problems. Strong family bonds have been shown to reduce adolescent risk-taking (Parker and Benson, 2004), and these results suggest that they also reduce the adverse consequences of risk-taking, at least with regard to drug use. Adolescents who have developed a strong sense of attachment to their parents and live in a family that is cohesive may be more likely to seek out their parents' help if they have encountered a significant problem related to their substance use. A positive parent-child relationship may foster open communication that can help parents address substance use behaviors that may lead to problems in the future (Brody et al., 1999). Overall, these findings suggest that parent-child attachment and family cohesion are important factors that may help protect adolescents who have a history of substance use from reaching a level of use that is likely to contribute to problematic outcomes.

Parental control was also a key protective factor reducing the probability of experiencing alcohol- and drug-related problems. Research has shown youth who experienced substance use-related problems may have also been prone to other types of problem behaviors (Barnes and Farrell, 1992), warranting increased disciplinary efforts from their parents due to other antisocial tendencies which may exacerbate substance use (Hicks et al., 2010). Parents may be responding to an array of behavioral problems, such as minor delinquent involvement behavioral referrals from school, which may occur as antecedents to or in conjunction with substance use. Closely monitoring children and controlling their behavior has a clearly protective effect on alcohol- and drug-related problems, especially during this important developmental period.



## 4.2. Racial/Ethnic group analyses

When the ethnic groups were examined separately, however, family cohesion was the only family variable in the Mexican heritage sample that was significantly associated with problems of alcohol and drug use. Despite recent research which found parental monitoring to be the predominant protective factor against substance use in a heterogeneous sample of Latino youth (including youth of Mexican, Salvadoran, Spanish, and Puerto Rican descent) (Wagner et al., 2010), family cohesion emerged here as the most important in protecting Mexican heritage youth against substance use-related problems. This finding is consistent with prior research which found family cohesion to have the strongest protective effect (relative to parental communication, parental monitoring, and familism) against marijuana use for Latino youth in the Los Angeles area (Lac et al., 2011). Greater family cohesion may be indicative of low levels of family conflict, stronger bonds to the family, and regular engagement in family activities. Traditional family norms in Mexican heritage families suggest alcohol use may be acceptable at social gatherings, but it should not be misused to cope with personal problems (De la Rosa, 2002). This may reflect the protective effects of the family environment with regard to heavy alcohol use and subsequent alcohol related problems for Mexican heritage youth (Castro and Alarcón, 2002). Family cohesion has also been found to be protective against ecological factors, such as neighborhood violence and economic hardship, which can contribute to substance use among Mexican heritage youth (Ramírez García et al., 2010). Strong family connections and family norms against adolescent drug use, which are present in many Mexican heritage families (De la Rosa, 2002), may discourage adolescents from substance use to avoid problems that would dishonor or otherwise distress their parents.

The findings for the White adolescents were slightly different from those observed in the Mexican heritage sample. Both parent-child attachment and family cohesion were significantly and inversely related to problems with alcohol use while parent-child attachment served as the sole family-related form of protection against drug-related problems. In addition, the parental control measure did not predict the odds of experiencing a drug- or alcohol-related problem for either ethnic group. This may be partially related to the reliability of the parental control variable, which was lower than desirable ( $\alpha = .60$ ) and may have accounted for the lack of a significant association between this variable and problems with substance use. Future research should investigate these issues to better understand these relationships.

The results, which did not support our second hypothesis, demonstrated that the protective effects of the family factors were not significantly different between Mexican heritage and White adolescents; that is, the interactions of ethnicity by family factors were not significant despite the different pattern of results in the two samples. The lack of significant interactions highlights the importance of parent-child attachment, and family cohesion to reduce the likelihood of adolescents' experiencing substance use-related problems, regardless of race/ethnicity. This is consistent with prior research which has also found many family variables, such as parental monitoring, parenting norms, and family involvement, can be equally protective against substance use among youth from different racial/ethnic groups (Wang et al., 2005; Windle et al., 2010; Yabiku et al., 2010).

## 4.3. Gender analyses

The family factors by gender interactions indicated the relationships of family factors with drug-related problems were not the same for males and females. Counter to our hypothesis, the significant interaction between gender and family cohesion in the Mexican heritage sample suggests that Mexican heritage females who have used drugs may be more at-risk than their male counterparts for experiencing problems related to their use. It is possible

females experience less protection from family cohesion because they may spend more time at home compared to their male siblings (Lac et al., 2011; Yabiku et al., 2010), and therefore may have less experience negotiating risky situations outside the home where most drug use takes place (Voisine et al., 2008). In other words, Mexican heritage males may be more protected by family cohesion because they are more likely to encounter opportunities for drug use outside the home, where family cohesion can act protective, compared to their female counterparts.

The parental control by gender interaction in the White sample supported our hypothesis with evidence females in this group experienced greater protection against drug-related problems compared to males. This relationship may represent responsive parents' successful efforts to prevent adolescent females from engaging in problematic levels of substance use, which reduced chances of experiencing behavioral problems (Baumrind, 1991). It may also be possible that adolescent females may be more likely to benefit from highly attentive and engaged parents compared to males (Radziszewska et al., 1996), and therefore experience greater protection against escalating substance use and behavioral problems related to use.

#### 4.4. Limitations

Although this study offers new insights into family factors to protect against substance use-related problems, there are limitations that deserve mention. Alcohol and drug users in the Add Health sample may not be representative of all alcohol or drug using youth. Given its school-based sampling frame, the study did not include youth not attending school and these youth may be at higher risk for substance use and abuse. The weights developed for the whole sample may also not be applicable to the subsample of substance users within the two racial/ethnic groups eligible for this analysis and were not applied. We acknowledge these restrictions may limit the generalizability of the findings. There may also be variability in the data due to the unsystematic administration of surveys in Spanish with Spanish-speaking respondents. The use of proxy measures for acculturation (e.g., language use and nativity) may be conveniently found in large datasets but these indicators do not fully capture the dynamic nature of cultural change inherent in this construct (Thomson et al., 2009). Therefore, we acknowledge the lack of depth found in these types of acculturation-related measures. Finally, the measures of substance use problems were based on self-reports which could be under-reported since these are undesirable outcomes.

#### 4.5. Conclusion

After considering the limitations of this study, these results are encouraging since many substance use treatment programs focus on the development of positive bonding to the family and the enhancement of parent-child relationships. These two features of the family appear to be important in reducing adolescents' substance use-related problems. Rather than simply guiding parents to exert greater behavioral control over adolescents as a predominant protective measure, treatment and prevention programs should also consider the ethnic- and gender-based dimensions to family interactions. Increasing family cohesion should be included as a treatment objective, especially for Mexican heritage youth, while objectives for White youth should focus on strengthening parent-child attachment. In addition, Mexican heritage and White females may not benefit from the same treatment objectives as their male counterparts. More research needs to be conducted to learn which family factors offer the best protection against substance use-related problems among adolescent females from different racial and ethnic backgrounds.

### Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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Table 1

Sample characteristics by racial/ethnic group for alcohol and drug users<sup>a</sup> from Wave I (1994–1995) and Wave II (1996) of the Add Health study

Variable	Alcohol users			Drug users		
	Aggregate sample (n=4,894)	Mexican heritage sample (n=619)	White sample (n=4,275)	Aggregate sample (n=2,875)	Mexican heritage sample (n=414)	White sample (n=2,461)
	%/Mean (Standard Deviation)	%/Mean (Standard Deviation)	%/Mean (Standard Deviation)	%/Mean (Standard Deviation)	%/Mean (Standard Deviation)	%/Mean (Standard Deviation)
Female	52%	48%	52%	51%	48%	52%
Single-parent household	57% <sup>†</sup>	62%	56%	53%	56%	52%
Parent's education						
Completed HS	31% <sup>†</sup>	27%	32%	31%	30%	32%
More than HS	56% <sup>†</sup>	30%	60%	56% <sup>†</sup>	31%	60%
Spanish spoken at home	--	41%	--	--	36%	--
US-born	--	69%	--	--	72%	--
Ever used alcohol/drug <sup>b</sup>	24% <sup>†</sup>	35%	40%	14%	23%	23%
Reported alcohol/drug-related problem	48%	48%	48%	31% <sup>†</sup>	26%	31%
Age	15.44 (1.54) <sup>*</sup>	15.73 (1.57)	15.40 (1.53)	15.52 (1.51) <sup>*</sup>	15.70 (1.57)	15.48 (1.49)
GPA	2.73 (0.78) <sup>*</sup>	2.50 (0.78)	2.77 (0.77)	2.59 (0.78) <sup>*</sup>	2.34 (0.76)	2.63 (0.77)
Parental control	1.74 (1.45) <sup>*</sup>	2.08 (1.63)	1.69 (1.42)	1.68 (1.46) <sup>*</sup>	1.99 (1.62)	1.62 (1.43)
Parent-child Attachment	4.16 (0.80)	4.13 (0.84)	4.17 (0.79)	4.06 (0.85)	4.10 (0.89)	4.06 (0.84)
Family cohesion	3.91 (0.65)	3.94 (0.69)	3.91 (0.65)	3.80 (0.68) <sup>*</sup>	3.87 (0.71)	3.79 (0.67)

<sup>a</sup> All independent and control variables measured at Wave I; alcohol- and drug related problems measured at Wave II.

<sup>b</sup> Proportion of alcohol/drug users relative to ethnic group in entire ADD Health study

<sup>\*</sup>  $t < .05$ ;

<sup>†</sup> Pearson chi-square  $< .05$

**Table 2**

Results of logistic regression analysis of Wave I (1994 – 1995) family factors, race/ethnicity, and gender predicting Wave II (1996) drug and alcohol-related problems among Mexican heritage and White youth

	Alcohol problems (n=4,894)		Drug problems (n=2,875)	
	OR	95% CI	OR	95% CI
Control Variables				
Female <sup>a</sup>	1.02	0.86 – 1.20	0.87	0.73 – 1.03
Mexican heritage <sup>b</sup>	1.06	0.87 – 1.31	0.85	0.62 – 1.17
Age	1.16 <sup>***</sup>	1.11 – 1.22	1.09 <sup>**</sup>	1.03 – 1.15
GPA	0.89 <sup>**</sup>	0.82 – 0.96	0.79 <sup>***</sup>	0.70 – 0.89
Single-parent household <sup>c</sup>	1.13	0.99 – 1.29	1.02	0.83 – 1.26
Parents' education <sup>d</sup>				
HS grad	1.22	0.99 – 1.50	1.32	0.99 – 1.75
More than HS	1.43 <sup>***</sup>	1.15 – 1.78	1.73 <sup>***</sup>	1.30 – 2.32
Predictor Variables				
Parental control	0.94 <sup>**</sup>	0.90 – 0.99	0.93 <sup>*</sup>	0.86 – 0.99
Parent-child attachment	0.91	0.84 – 1.00	0.87 <sup>*</sup>	0.77 – 0.98
Family cohesion	0.74 <sup>***</sup>	0.65 – 0.84	0.82 <sup>*</sup>	0.70 – 0.97

<sup>a</sup>Males were coded as the comparison group.

<sup>b</sup>White youth were coded as the comparison group.

<sup>c</sup>Non two-parent households were coded as the comparison group.

<sup>d</sup>Parents who did not complete high school were coded as the comparison group.

\*  $p < .05$ ,

\*\*  $p < .01$ ,

\*\*\*  $p < .001$

**Table 3**

Results of logistic regression of Wave I (1994 – 1995) family factors predicting Wave II (1996) alcohol-related problems by racial/ethnic group.

	Mexican heritage Sample		White Sample	
	(n=619)		(n=4,275)	
	OR	95% CI	OR	95% CI
Control Variables				
Female <sup>a</sup>	0.70	0.46 – 1.08	1.07	0.91 – 1.26
Age	1.05	0.95 – 1.16	1.19 <sup>***</sup>	1.13 – 1.25
GPA	0.89	0.71 – 1.12	0.88 <sup>**</sup>	0.82 – 0.96
Single-parent household <sup>b</sup>	0.60 <sup>**</sup>	0.43 – 0.84	1.24 <sup>**</sup>	1.09 – 1.41
Spanish spoken at home <sup>c</sup>	0.96	0.59 – 1.56	--	--
US-born <sup>d</sup>	1.04	0.81 – 1.34	--	--
Parents' education <sup>e</sup>				
HS grad	1.19	0.71 – 1.99	1.22	0.94 – 1.58
More than HS	1.06	0.74 – 1.51	1.46 <sup>**</sup>	1.09 – 1.96
Predictor variables				
Parental control	0.92	0.82 – 1.03	0.95	0.91 – 1.00
Parent-child attachment	1.07	0.84 – 1.36	0.89 <sup>*</sup>	0.81 – 0.99
Family cohesion	0.62 <sup>*</sup>	0.41 – 0.93	0.75 <sup>***</sup>	0.67 – 0.85

<sup>a</sup>Males were coded as the comparison group.

<sup>b</sup>Non two-parent households were coded as the comparison group.

<sup>c</sup>Youth who did not speak Spanish at home were coded as the comparison group.

<sup>d</sup>Youth who were born outside the US were coded as the comparison group.

<sup>e</sup>Parents who did not complete high school were coded as the comparison group.

\*  $p < .05$ ,

\*\*  $p < .01$ ,

\*\*\*  $p < .001$



**Table 4**

Results of logistic regression of Wave I (1994 – 1995) family factors predicting Wave II (1996) drug-related problems by racial/ethnic group.

	Mexican heritage Sample		White Sample	
	(n=414)		(n=2,461)	
	OR	95% CI	OR	95% CI
Control variables				
Female <sup>a</sup>	1.05	0.68 – 1.62	0.85	0.70 – 1.03
Age	0.97	0.87 – 1.08	1.11 ***	1.04 – 1.18
GPA	0.68 **	0.52 – 0.88	0.80 ***	0.70 – 0.91
Single-parent household <sup>b</sup>	1.04	0.53 – 2.05	1.06	0.85 – 1.33
Spanish spoken at home <sup>c</sup>	0.54	0.29 – 1.00	--	--
US-born <sup>d</sup>	1.50	0.80 – 2.83	--	--
Parents' education				
HS grad <sup>e</sup>	0.93	0.48 – 1.77	1.31	0.93 – 1.86
More than HS	1.17	0.66 – 2.08	1.73 **	1.20 – 2.49
Predictor variables				
Parental control	0.93	0.78 – 1.11	0.93	0.87 – 1.00
Parent-child attachment	1.11	0.86 – 1.43	0.85 **	0.74 – 0.96
Family cohesion	0.62 **	0.42 – 0.90	0.86	0.72 – 1.02

<sup>a</sup>Males were coded as the comparison group.

<sup>b</sup>Non two-parent households were coded as the comparison group.

<sup>c</sup>Youth who did not speak Spanish at home were coded as the comparison group.

<sup>d</sup>Youth who were born outside the US were coded as the comparison group.

<sup>e</sup>Parents who did not complete high school were coded as the comparison group.

\*  $p < .05$ ,

\*\*  $p < .01$ ,

\*\*\*  $p < .001$