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School, Family, and Peer Factors and Their Association with Substance Use in Hispanic Adolescents

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Abstract

The purpose of the present study was to examine how relationships among family, school, and peer factors relate to likelihood of substance use in Hispanic adolescents. Results indicated that only perceived peer substance use was directly related to adolescents' own substance use. A significant interaction was found between parental monitoring and peer use vis-à-vis substance use, which suggests that the relationship between parental monitoring and the adolescents' own use was significantly stronger among youth who reported that more of their friends used substances. Implications of these results for the design of substance use preventive interventions are discussed. *Editors' Strategic Implications:* This research is promising both in terms of the implications for targets of prevention programming and for the application of ecodevelopmental theory, which might guide similar efforts with different cultural groups.

Keywords

Hispanic; Substance use; Adolescents; Peer substance use; School functioning

Introduction

Adolescent substance use presents a significant public health concern in and of itself, as well as through its association with several negative outcomes, including unsafe sexual activity (Stueve and O'Donnell 2005), criminal involvement (Flory et al. 2004), and lowered educational attainment (McLeod and Kaiser 2004). Rates of substance use rapidly increase between childhood and adolescence (Johnston et al. 2007), which highlights the increased risk for substance use initiation and increases in use associated with this age period. However, there are important health disparities in substance use, and substance use and associated problems are not distributed equally among ethnic groups. Middle school-aged Hispanic youth are at greater risk for use of nearly all classes of substances (including cigarettes and alcohol) compared to similarly aged non-Hispanic White and African American youth (e.g., Johnston et al. 2007) in some studies. However, the reverse was found in community studies of youth ages 12–17 (e.g., National Survey on Drug Use and Health, 2005).

The heterogeneity that exists among the U.S. Hispanic population also may be involved in these inconsistent findings; when Hispanic subgroups (e.g., Cubans, Puerto Ricans) are analyzed separately, important variations emerge in rates of substance use (Delva et al. 2005; Wallace et al. 2002). However, the high rates of substance use reported by some studies and the size, youthfulness, and rapid growth rate of the U.S. Hispanic population suggest that preventing substance use among Hispanic adolescents is an urgent public health priority (Guzman 2001). The Hispanic population currently represents nearly 15% of the total U.S. population, and half of all people added to the U.S. population between 2000 and 2007 were Hispanic (Bernstein 2007). Moreover, Hispanics are a young population, with nearly 40% under the age of 20 (Ramirez and de la Cruz 2003).

In the present study, we examined the associations of peer, family, and school influences and the likelihood of substance use in Hispanic youth. Although the individual and combined effects of family and peer contexts in increasing risk or protection for adolescent substance use have been frequently studied in general population samples (e.g., Youngblade and Curry 2006), the ways in which school factors combine with family and peer factors to increase or decrease likelihood of substance use in Hispanic youth has received little attention. In light of the unique cultural factors facing Hispanic families (e.g., acculturation and familism; see Prado et al. 2008), it is important to replicate with Hispanic families findings from past research using non-Hispanic samples in order to affirm that the same risk and protective processes operate for Hispanics.

Ecodevelopmental theory (Szapocznik and Coatsworth 1999), which is based on Bronfenbrenner's (1979) ecological perspective, represents the theoretical basis for this study. Ecodevelopmental theory proposes four levels of the social environment for adolescents (i.e., macrosystem, exosystem, mesosystem, and microsystem), with each level nested within the next. In the present study, we examine risk and protective factors for substance use involving the family–peer and family–school mesosystems (relationships between the adolescent's worlds) as well as the school microsystem (in which the adolescent participates directly) in order to identify potential targets of preventive interventions. In addition to Bronfenbrenner's work, ecodevelopmental theory also incorporates a social interaction theory. Social interaction theory posits that processes of risk and protection are

expressed as patterns of relationships and direct transactions between (a) persons and (b) processes. These processes lie within and across systemic levels (Pantin et al. 2004; Schwartz et al. 2006).

Consistent with studies conducted on general population samples, parental monitoring has been found to influence risk for substance use in Hispanic youth (Kliewer et al. 2006; Swaim et al. 1998). Parental monitoring has been found to exert both direct (Griffin et al. 2000; Ramirez et al. 2004) and indirect (through decreasing risk for associating with substance using peers; Sieving et al. 2000; Simons-Morton and Chen 2005) effects on adolescent substance use. Indeed, association with substance using peers is one of the most proximal risk factors for adolescent substance use (Richardson et al. 2002; Simons-Morton et al. 2001). For example, in a population-based study conducted in a single urban school district, Simons-Morton et al. (2001) found that sixth to eighth grade youth with two or more friends who drank alcohol were 4.5 times more likely to drink compared to youth with no friends who drank. Because parental monitoring has been shown to offset the effects of deviant peer affiliations on likelihood of adolescent substance use (Dishion et al. 2004; Svensson 2003), monitoring is an especially important aspect of parenting.

Parental academic involvement also has been found to decrease risk for substance use by promoting academic success, bonding to school, and appropriate classroom behavior (Hill and Taylor 2004; Rodriguez 2002). Poor academic functioning represents an important risk factor for adolescent substance use because adolescents who function poorly in school, including lower grade point average (Martins and Alexandre 2009; Murguia et al. 1998; Myers et al. 2003; Urberg et al. 2003), school conduct problems (Menon et al. 1990), and poor school attendance (King et al. 2006; Engberg and Morral 2006) are more likely to associate with substance using peers (Mounts and Steinberg 1995; Swaim et al. 1998).

Adding to the complexity of the relationships among these risk and protective processes is that their effects often vary by gender. Gender variations have been found in the effects of risk and protective factors to substance use, both in Hispanic and non-Hispanic youth. These risk and protective factors include family functioning (e.g., parental monitoring; Borawski et al. 2003; Griffin et al. 2000), school functioning (Garnefski and Okma 1996), and associations with deviant peers (Brook et al. 1998). For example, in a sample of Colombian adolescents, peer alcohol and drug use was a weaker risk factor for marijuana use among girls than among boys (Brook et al. 1998). Moreover, Garnefski and Okma (1996) found that problems in school were strongly associated with behavior problems for boys, whereas family problems were strongly associated with behavior problems for girls. Finally, Borawski et al. (2003) and Griffin et al. (2000) found that parental monitoring was associated with substance use only for boys. However, there are some inconsistencies in the findings of extant research, which suggests that further research may be needed to more completely explore the role of gender in the relationship of these risk and protective processes to substance use. Moreover, little is known about Hispanic adolescents in this regard. Gender may be particularly important in Hispanic families due to the strongly delineated gender roles in Hispanic cultural contexts, which can influence how sons versus daughters are parented. For example, parents often are characterized as using more authoritative and egalitarian parenting practices with adolescent sons but stricter and more authoritarian parenting practices with adolescent daughters (Dornbusch et al. 1990; Hovell et al. 1994).

As reviewed above, processes within the family–school and family–peer mesosystems have been found to protect against affiliation with substance using peers and, ultimately, against adolescent substance use. The mechanisms through which these protective effects operate may be somewhat different: parental monitoring of peers tends to decrease affiliation with

deviant friends (and to minimize the effects of such affiliations), whereas parental involvement in school tends to promote academic achievement and bonding to school, which are protective against association with deviant friends. However, with few exceptions, the protective effects of the family–school and family–peer mesosystems, as well as the mechanisms through which these mesosystemic processes operate, have not been studied in Hispanic adolescents.

Therefore, the purpose of the present study was to examine the cross-sectional associations of family–peer and family–school mesosystemic processes with adolescent substance use (see Fig. 1). Taking into consideration our theoretical model and Kraemer’s work on the risk process (Kraemer et al. 2001; Kraemer 2003), we base our hypotheses on past cross-sectional and longitudinal research. We examine four specific hypotheses concerning indirect paths: (1) Poor school functioning and perceived peer substance use both will mediate (within a single path) the relationship between parental academic involvement and substance use; (2) Perceived peer substance use will mediate the relationship between parental monitoring and adolescent substance use; (3) Perceived peer substance use will mediate the relationship between poor school functioning and adolescent substance use; and (4) The association of perceived peer substance use and adolescent substance use will be moderated by parental monitoring. Finally, we will examine gender as a moderator of all of the associations in the model. Given the inconsistent findings reported in the literature, we do not advance specific predictions regarding the role of gender.

Methods

Participants

The sample was composed of 361 Hispanic adolescents (181 girls, 180 boys; mean age 13.5 years, SD 0.73) and their parents recruited from three middle schools with a large proportion of Hispanic immigrants. Data used in these analyses were taken from the baseline assessment of a substance use and HIV preventive intervention study (Prado et al. 2007). Data were collected before participants were randomized to condition. Sixty percent of adolescents were born outside the United States (Caribbean, Central America, or South America). Of foreign-born adolescents, 47% had been living in the U.S. for fewer than 3 years.

All participating parents were born in Spanish-speaking countries in the Caribbean, Central America, or South America. Eighteen percent of the parents had been living in the U.S. for fewer than 3 years, and the remainder for 3 years or more. Seventy percent of parents had a high school education or less, and 26% had completed at least 1 year of post-secondary education. Parents’ median annual family income was between \$15,000 and \$20,000.

Recruitment and Study Procedures

Adolescents and their families were recruited in two cohorts: May 2001 and May 2002. During the recruitment phase, all seventh grade students in three participating middle schools were asked to take home a recruitment letter briefly describing the study to their parent(s) and return the signed letter. Interested parents were contacted by project staff and, if still interested, were screened for eligibility along with their adolescents. Eligibility criteria included: (a) at least one parent was born in a Spanish-speaking country in the Americas; (b) the adolescent lived with the participating parent, was attending one of the participating schools, and would advance to the eighth grade; (d) no history of psychiatric hospitalization; (e) the family was not planning to move out of the South Florida area during the study period; and (f) the primary parent was available to attend weekly intervention sessions. The recruitment and screening procedures (as well as all other study procedures)

were approved by the Institutional Review Boards from both the University of Miami and the Miami-Dade County School Board.

Of the 649 potential families, 70 refused to participate. Of the remaining 579, 218 either had adolescents who were not promoted to the eighth grade, were planning to move, were not living within the catchment area of one of the three participating middle schools, or did not have a primary caregiver who was available to attend intervention sessions. The remaining 361 families (adolescent and primary parent) completed the baseline assessments.

Baseline Assessments

Adolescent-report measures were completed on laptop computers using the audio computer assisted interviewing (audio-CASI) system (Turner et al. 1998). The content of each questionnaire item, along with the response choices, were read aloud in the language of the adolescent's choice (i.e., Spanish or English) through a set of headphones connected to a laptop computer. Parents completed their measures with the assistance of interviewers who read each item and the response choices aloud and recorded their answers. Different assessment formats were used for adolescents and for parents as a result of the pilot phase of the study where many parents expressed discomfort about completing their own assessments in computerized form.

Measures

Where appropriate, we calculated Cronbach's α using data from the present study.

Immigration Status (Years Resided in the U.S.)—Parents were asked “How long have you lived in the United States?” to assess length of stay in U.S. Possible responses were fewer than 3 years, 3–10 years, or more than 10 years. Responses were categorized into fewer than 3 years (recent immigrant) and more than 3 years in the U.S.

Parental Monitoring—Parental monitoring was assessed using both adolescent (6 items) and parent (5 items) reports. Parental reports of monitoring were gathered using the parents and Peers Scale (Pantin 1996), which assesses parents' attempts to actively supervise their adolescents and to know their adolescents' peer network, including their peers' parents (e.g., “How well do you personally know your child's best friends?”). Parents responded on a Likert scale ranging from 1 (*not at all*) to 5 (*extremely well*). Evidence of construct validity of scores on this measure has been provided by Coatsworth et al. (2002a, b), who found that active monitoring was protective against externalizing problems. In the present study, Cronbach's α was .87.

Adolescent reports of parental monitoring were assessed using the parental monitoring subscale from the Parenting Practices Scale (Gorman-Smith et al. 1996), which assesses the adolescent's perceptions of the parent's knowledge about the adolescent's whereabouts when s/he is not at home (e.g., How much do your parents really know where you go at night?). Adolescents rated each item on a 3-point Likert scale ranging from “1 = my parents' don't know” to “3 = my parents' know a lot.” Cronbach's α was .82.

Parental Academic Involvement—Parent and adolescent reports of parental academic involvement (1 item each) were assessed using the extent of involvement subscale of the Parenting Practices Scale (Gorman-Smith et al. 1996). A 5-point Likert scale ranging from 1 (*Never*) to 5 (*Always*) was used to rate responses. The adolescent item reads: “How often does the person who is most in charge of you talk with you about how you are doing in school?” and the parent item is “How often do you talk to your child about how he/she is doing in school?”

Poor School Functioning—School functioning was assessed via teacher, parent, and adolescent reports. Teacher reports of school functioning comprised conduct and academic grades, number of school absences, and number of times the adolescent was “tardy.” Academic and conduct grades were measured on a 5-point scale ($A = 4$, $B = 3$, $C = 2$, $D = 1$ and $F = 0$). Because the distributions for the total number of absences and tardies were not normal, the total number of absences and tardies for the school year were divided into three quartiles to arrive at four categories.

Adolescent reports of school functioning were gathered using 2 items from the Youth Self-Report (Achenbach et al. 2002). Adolescents responded on a 3-point Likert-type scale, ranging from 0 (*not true*) to 2 (*very true or often true*), to each of the following two items: “I disobey at school” and “My school work is poor.”

Parent reports of school functioning were gathered using 1 item from the Revised Behavior Problem Checklist (Quay and Peterson 1987). Parents indicated their level of agreement with the statement “school work is messy, sloppy” for their adolescents. Responses were rated on a 3-point scale ranging from 0 (*no problem*) to 2 (*severe problem*).

Adolescent Lifetime Substance Use—Our aim was to create a measure of severity of substance use. Thus, our measure consisted of the number of substances as well as the number of times each substance was used. Adolescents’ own report of lifetime cigarette, alcohol, and illicit drug use was assessed using 3 items from the Monitoring the Future Survey (MTF: Johnston et al. 2007): “Have you ever smoked cigarettes?”, “Have you ever had any beer, wine, wine coolers, or liquor to drink—more than just a few sips?”, “Have you ever used drugs?” Adolescents’ responses to these items were either *yes* or *no*. A response of “yes” on any of the three questions was coded as “yes” for substance use.

Perceived Peer Substance Use—Peer smoking (1 item), alcohol (1 item), and drug use (14 items, $\alpha = .89$) were measured using “adapted” items from the MTF (Johnston et al. 2007). The items were adapted by replacing the “have you” in the original item with “how many of your friends have”. A sample item is “How many of your friends have ever used marijuana?” Adolescents responded to each item on a 5-point scale ranging from *all of them* to *none of them*. Because relatively few of the youth identified *some* or *all* of their friends as using drugs we combined the three responses of *some*, *most*, or *all* indicating the highest use to arrive at three categories (none of them, very few of them, and some to all of them). Next, the response scale was recoded so that higher scores reflected greater perceived peer substance use. Finally, the peer drug use items were summed, and this score was divided by the number of drugs reported to create the average amount of peer drug use.

Data Analytic Strategy

Gender differences in the study variables were examined using multivariate analysis of variance and chi-square tests. Bivariate correlations among all study variables also were computed. Structural equation modeling was used to test study hypotheses. First, confirmatory factor analyses were estimated to ascertain the feasibility of collapsing multiple indicators of each construct into latent variables. Second, we estimated the hypothesized structural model. The comparative fit index ($CFI \geq .95$), and the root mean square error of approximation ($RMSEA \leq .06$) was used to evaluate model fit (Byrne 2001). The Chi-square statistic is reported but is not used in interpretation because it often indicates significant deviations between the model and the data even when these deviations are quite small (Kline 2006). Reliability for each latent variable was then calculated, where reliability represents the ratio of the variance explained by the latent variable to the total variability among the indicators (Fornell and Larcker 1981). Third, given the prior finding (e.g.,

Dishion et al. 2004) that parental monitoring may offset the association of deviant peer affiliations with substance use, we examined significant interactions between parental monitoring and perceived peer substance use using methods outlined by Holmbeck (2002). Specifically, we examined whether the interaction between parental monitoring and peer substance use was a significant predictor of substance use. We created interaction terms by centering each of the main effect terms and multiplying them. In cases where this interaction term emerged as a significant predictor, we explored the interaction by comparing the slope for parental monitoring for adolescents who were 1 SD or more below the mean on peer substance use against those who were 1 SD or more above the mean.

Fourth, we investigated the mediational hypotheses using the bias-corrected bootstrap method (MacKinnon et al. 2004), which provides more accurate confidence intervals than the more conventional, normal distribution-based method. The point estimate and a 95% CI are reported. Provided that the 95% CI does not include zero, mediation is assumed. Finally, invariance testing was accomplished by comparing (a) a model with all paths free to vary across gender against (b) a model with all paths constrained equal across gender. A non-significant $\Delta\chi^2$ (adjusted for non-normality; Bentler and Satorra 2000) indicates that the model is consistent across gender. However, if a significant $\Delta\chi^2$ is obtained, ΔCFI and $\Delta NNNFI$ (nonnormed fit index) also was used to evaluate gender invariance (e.g., Cheung and Rensvold 2002). If either the ΔCFI or the $\Delta NNNFI$ also are significant, the invariance assumption is rejected. All analyses were conducted using Mplus 4.1 (Muthén and Muthén 1998–2007).

Results

Gender Differences in School, Family, and Peer Factors and Early Substance Use

Descriptive statistics for risk and protective factors as well as for substance use are presented separately by gender in Table 1. Significant gender differences in the individual indicators were found for poor school functioning and substance use. Overall, boys reported worse functioning in school and more substance use than girls.

Measurement Models

Bivariate correlations are presented in Table 2.

Poor School Functioning—Seven items were included in this model (teacher and adolescent report of classroom conduct, grade point average, number of absences and tardies, and parent and adolescent report of poor school work). The model fit the data well, $\chi^2(8) = 11.06, p = .20$; CFI = .99; RMSEA = .03. Test of invariance indicated that the measurement model was consistent across gender $\Delta\chi^2(6) = 9.21, p = .16$. Absolute values of the pattern coefficients ranged from .36 to .63, and reliability was .76.

Perceived Peer Substance Use—Because three indicators were used (i.e., peer use of cigarette, alcohol, and illicit drug use), the model was just-identified and, by definition, provided a perfect fit to the data. Tests of invariance suggested that the model was significantly different across gender, $\Delta\chi^2(2) = 6.58, p = .04$, $\Delta CFI = .008$, $\Delta NNNFI = .006$. To identify which indicator was responsible for the noninvariance, we used Byrne's (2001) method. The pattern coefficients for peer smoking (boys: 0.98, girls: 0.84, both $p < .001$) and peer alcohol use (boys: .079, girls: 0.96, both $p < .001$) varied by gender. However, the difference between the two coefficients was small. The absolute value of the pattern coefficients ranged from .85 to .92, and reliability was .88.

Early Adolescent Substance Use—Three indicators were used (i.e., cigarette, alcohol, and illicit drug use), and the model was just-identified. Pattern coefficients ranged in absolute value from .76 to .99, and reliability was .89, which suggests that the latent variable adequately represented the data. Test of invariance indicated that the latent variable was consistent across gender $\Delta\chi^2(3) = 4.17, p = .24$.

Tests of Hypotheses

A structural path model was estimated to examine the hypothesized relationships (see Fig. 1). Poor school functioning was entered as an observed factor score (calculated as a weighted and standardized composite) because including school functioning as a latent variable would have resulted in a low parameter-sample size ratio (Kline 2006). The model provided a good fit to the data, $\chi^2(26) = 49.36, p < .001$, CFI = .97, RMSEA = .05. The model also was found to fit equivalently across gender, $\Delta\chi^2(15) = 14.92, p < .46$. The percentage of variance accounted for in the dependent variables in the model was as follows: parent report of parental academic involvement, 0.1%; adolescent report of parental academic involvement, 1.1%; poor school functioning, 2.3%; perceived peer substance use, 13.4%; and early substance use, 68.0%. Next, we entered interaction terms for parental monitoring (adolescent and parent report) and perceived peer substance use. Only the interaction between parental monitoring adolescent report and perceived peer substance use was significant.

Given that the overall model fit the data well, we proceeded to examine specific hypotheses.

Hypothesis 1—Poor school functioning and perceived peer substance use will partially mediate the relationship between parental academic involvement and substance use.

Parent and adolescent report of parental academic involvement were not significantly related to poor school functioning, and tests of mediation did not produce significant results.

Hypothesis 2—Perceived peer substance use will partially mediate the relationship between parental monitoring and adolescent substance use.

Parental monitoring (parent and adolescent report) was not significantly related to perceived peer substance use, and tests of mediation did not produce significant results.

Hypothesis 3—Perceived peer substance use will partially mediate the relationship between poor school functioning and adolescent substance use.

Poor school functioning was indirectly related to early substance use through perceived peer substance use. Results of bias corrected bootstrap indicated significant mediation (point estimate: 0.51, 95% CI: 0.22–1.05).

Hypothesis 4—The association of perceived peer substance use and adolescent substance use will be moderated by parental monitoring.

To test this hypothesis, we examined interactions between parental monitoring and perceived peer substance use. As shown in Fig. 2, two interaction terms were entered into the model. The main effect of peer substance use on early substance use was strong and significant ($\beta = .78, p < .001$), whereas the main effect of adolescent report of parental monitoring was not significant ($\beta = -.10, p = .18$). The interaction between parental monitoring adolescent report and perceived peer substance use was significant as a predictor of early substance use ($\beta = -.19, p < .05$), so we examined this moderated effect further.

For adolescents whose reports of perceived peer substance use were 1 SD or more above the mean, the association between parental monitoring and early adolescent substance use was significant, $\beta = -.26$, $p < .05$. In contrast, for adolescents whose reports of perceived peer substance use were 1 SD or more below the mean, the association between parental monitoring and early adolescent substance use was only marginally significant, $\beta = -.11$, $p < .08$. This interaction is presented graphically in Fig. 3. Results suggest that, among youth reporting that most of their friends use substances, increased parental monitoring is associated with decreased substance use. In contrast, among youth reporting few or no friends using substances, parental monitoring is only weakly associated with substance use.

Discussion

The present study was designed to examine the relationships of parent–school and parent–peer mesosystemic processes to early adolescent substance use, as well as the potential mediating and moderating roles of school functioning and deviant peer affiliations in these relationships, in a sample of Hispanic immigrant adolescents. We also investigated whether these relationships varied by gender. We found that immigration status, parental academic involvement, school functioning, perceived peer substance use, and parental monitoring accounted for over 60% of the variance in early substance use, with peer substance use having the greatest association with early substance use. Because adolescents were asked to report on both their own substance use and that of their peers, some common method variance may have affected the results (e.g., Podsakoff et al. 2003; Prinstein and Wang 2005). Nonetheless, it is noteworthy that these contextual variables were able to explain a considerable proportion of variability in precocious substance use in the present sample. Moreover, we found that adolescents' perceptions of their peers' substance use significantly mediated the association between school problems and adolescents' reports of their own substance use.

In our results, the association between immigration status and parental academic involvement and the indirect effect of parental involvement in school on early adolescent substance use through poor school functioning and peer substance approached significance. Results from past studies suggest that parents' involvement in their youth's school related activities decreases risk for poor school functioning, which in turn decreases risk that their youth will associate with peers who use substances (Hill and Taylor 2004; Rodriguez 2002). This may be particularly important for Hispanic parents, who may feel disconnected from the U.S. educational system, largely due to cultural and language differences (Coatsworth et al. 2002a, b). More work clearly is needed to further explore the relationship between parental academic involvement and precocious substance use in Hispanic adolescents.

Consistent with past research (Richardson et al. 2002; Simons-Morton et al. 2001), peer substance use was a strong predictor and mediator in our model. Although the mediation effect of peer substance use was in the moderate to large range (Cohen 1988), the strength of these effects should be interpreted with caution because youth reported on their own as well as their peers' substance use. Adolescents may be likely to base their reports of their friends' behaviors, in part, on their own behavior—thereby inflating the relationship between peer substance use and adolescents' own substance use (Prinstein and Wang 2005). Despite this caveat, the present results suggest that, in Hispanic adolescents, peer substance use may be a more proximal risk factor for early substance use than school functioning. This is consistent with other work suggesting that peer behavior is most “proximal” to adolescent outcomes, and that the effects of school variables to adolescent outcomes operate, at least in part, through peer affiliations.

Consistent with past studies that have found that the effect of parental monitoring on substance use may be moderated by the level of parental monitoring (Dishion et al. 2004; Svensson 2003; Wood et al. 2004), we found a significant interaction between adolescent-reported parental monitoring and peer substance use vis-à-vis adolescents' own reports of substance use. Probing the interaction suggested that, for youth whose friends use substances, parental monitoring is most strongly and negatively associated with adolescents' own substance use, which is consistent with past findings (Svensson 2003). In contrast, among youth with few or no friends using substances parental monitoring was not significantly related to substance use.

Our findings concerning parental monitoring were limited to adolescent reports of monitoring. This is generally consistent with Cottrell et al. (2003), who found that adolescent reports of parental monitoring are more strongly associated with substance use than parent reports of parental monitoring. This may be due, at least in part, to shared method variance, although adolescents' perceptions of their parents' knowledge and monitoring also may guide the types of friends with whom they affiliate.

Surprisingly, the effect of poor school functioning and parental monitoring on risk for early adolescent substance use did not vary by gender. Prior research suggests that the protective effect of school for girls may reflect the tendency for girls to evidence more favorable school functioning and be more bonded to school than boys (Bank 1997; Suárez-Orozco and Quin-Hilliard 2004). Consistent with Crosnoe et al. (2002), we found that girls had significantly higher school functioning than boys. It may be that, although adolescent girls were functioning well in school, they were less strongly bonded to school.

Regarding parental monitoring, researchers have focused on gender differences in parental monitoring to explain gender differences in the relationship between parental monitoring and substance use. Some researchers suggest that boys are monitored more closely, view monitoring as overly restrictive, and this perception pushes them toward conforming to their peer group (Crosnoe et al. 2002; Webb et al. 2002). Among Hispanic families, parents often are characterized as using more authoritative and egalitarian parenting practices with adolescent sons but stricter and more authoritarian parenting practices with adolescent daughters (Dornbusch et al. 1990; Hovell et al. 1994). However, in the present study, boys and girls, as well as their parents, reported similar levels of monitoring. It is clear from these results that the effect of parental monitoring on early adolescent substance use in Hispanics warrants further study.

Another way in which Hispanic and non-Hispanic families may differ, and that may have an impact on the etiology of substance use for Hispanic families, is in Hispanic cultural values that focus on collectivism and familism (Santisteban et al. 2002). This is in contrast to American values, which center on individualism. In a recent study by Romero and Ruiz (2007), family closeness at time 1 predicted parental monitoring at time 2, which in turn inversely predicted risky behavior at time 2. Given these important cultural differences between Hispanic and non-Hispanic families, it is important for future research to examine the effect of cultural aspects such as familism and the influence of extended family networks on the etiology of substance use in Hispanic families.

Limitations

The present results should be considered in light of several important limitations. First, the Hispanic population in Miami is quite different from the U.S. Hispanic population as a whole. Whereas individuals of Cuban descent represent nearly half of the Miami Hispanic population (Stepick and Stepick 2002), Cubans represent only 4% of the Hispanic population as a whole (Guzman 2001). Therefore, the present findings should be replicated

with Mexican-Americans and Puerto Ricans, who together represent 75% of the U.S. Hispanic population (Marotta and Garcia 2003) but are not well represented in Miami. Replication of these results are needed before any firm conclusions can be made and used to modify existing or design new prevention interventions for adolescent substance use in Hispanics.

A second limitation is our use of a small number of items to measure parental involvement in school and adolescent and parent report of school functioning. Parental involvement in school encompasses several types of behaviors, including monitoring school work and progress in school, attending school activities, and engaging teachers and school administration officials (Hill and Taylor 2004). Although our measure of school functioning encompasses several behaviors (e.g., grade point average, school conduct, and attendance), it mainly is based on teacher reports. More inclusive measures of parental academic involvement and school functioning are important to identify which components would be the best targets for interventions.

Third, the use of self-reports for some study variables warrants caution. Although we gathered reports from adolescents, parents, and teachers, both peer substance use and the adolescent's own substance use were assessed using adolescent reports. The use of adolescent reports of peer substance use may result in overestimating the relationship between peer substance use and adolescent outcomes (Prinstein and Wang 2005).

Fourth, we used lifetime substance use for our outcome, which may be considered by some as less reliable. We chose lifetime versus last 30- or 90-day substance use for two reasons. First, our sample consisted of eighth grade adolescents (mean age 13.5-years-old), and at this age one would expect to have low base rates characterizing use of most substances, and rates of substance use in the 30 and 90 days prior to assessment were even lower. The low base rate of use would have yielded very little statistical power to detect significant results. Also, our strategy was to differentiate users from non-users and last 30- or 90-day use would have likely failed to capture youth who had not used within that time frame but would still be considered users.

Fifth, most studies that assess parental monitoring frequently use only adolescent reports (e.g., Benjet et al. 2007; Hair et al. 2008; Romero and Ruiz 2007; Tragesser et al. 2007; Rai et al. 2003; Spano et al. 2008). We used both parent and adolescent reports in this study to gain a better understanding this aspect of family functioning and found that parent and adolescent reports of monitoring were uncorrelated. However, this largely is consistent with the limited number of studies available that have assessed parental monitoring from both parent and adolescent reports. These studies found that the correlation between parent and adolescent reports of monitoring ranges from .08 (Cottrell et al. 2003), to .38 (Stattin and Kerr 2000) in non-Hispanic samples. No articles were found that examined this issue in Hispanic families, which suggests that additional research is needed.

Sixth, we included only those families who consented and assented to participate in the study. This recruitment procedure is associated with possible self-selection biases because families who enroll in the intervention may have better functioning than those who do not enroll (Perrino et al. 2001). We were unable to examine group differences between families who enrolled in the study and those who did not because informed consent was obtained only from families who were screened and determined to be eligible for the study. As a result, it is unclear how much these families represent the local population from which families were recruited.

Finally, the present study was cross-sectional and did not examine relationships over time. As a result, no causal inferences can be drawn from these results, and replication is needed

using a longitudinal framework (Maxwell and Cole 2007). However, the present results are suggestive of hypotheses for future longitudinal research.

Future Directions and Implications for Intervention

Despite these limitations, the present study represents an important step toward examining the role of multiple contexts in increasing and decreasing risk for substance use in Hispanic adolescents. As such, the present findings suggest possible targets for interventions to prevent early substance use in Hispanic adolescents. Although replication of these results is necessary before any firm conclusions may be made, the effects of the risk factors examined did not vary by gender, which suggests that multisystemic intervention programs to prevent substance use in Hispanic adolescents may be efficacious across gender. Poor school functioning, peer substance use, and parental monitoring were most important for early substance use—which suggests that these processes should be the focus of intervention efforts. The significant interaction between parental monitoring and peer substance use suggests that interventions aimed at increasing parental monitoring should target adolescents who are at highest risk for affiliating with deviant peers. It is through this kind of knowledge development and application that research on correlates and predictors of substance use in Hispanic adolescents may bear the most fruit.

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Fig. 1.
Hypothesized relationships among family and school and peer contexts and risk for early substance

Fig. 2. Relationship of family and school and peer contexts and risk for early substance. *Note:* $\chi^2(30) = 57.20, p = .00$, CFI = 0.97 and RMSEA = 0.05. + $p < .10$; * $p < .05$; ** $p < .01$; *** $p < .001$; A adolescent report, P parent report. Only paths significant at $p < .10$ are presented. *Bold paths* represent significant mediation

Fig. 3. Early substance use and parental monitoring in youth with low versus high number of friends using substances

Table 1

Distribution of study variables by gender

	Recent immigrant	School	P-PAI	A-PAI	P-Monit	A-Monit	F-use	Use
Males	49.2%	0.260 (0.831)	4.637 (0.379)	4.313 (0.756)	16.125 (31.017)	16.154 (6.004)	0.078 (0.541)	0.168 (0.354)
Females	48.8%	-0.247 (0.684)	4.707 (0.342)	4.133 (1.122)	15.477 (30.984)	16.549 (4.865)	-0.076 (0.492)	-0.053 (0.295)
p-Value	0.402	0.000 (0.194)	0.267 (0.491)	0.080 (0.009)	0.310 (0.995)	0.153 (0.210)	0.046 (0.527)	0.000 (0.226)

Note: For all continuous variables means with variances are presented in parentheses. For categorical variables frequencies are presented

School poor school functioning, P-PAI parental academic involvement parent report, A-PAI parental academic involvement adolescent report, P-Monit parental monitoring parent report, A-Monit parental monitoring adolescent report, F-use perceived peer substance use, Use early substance use

Table 2

Correlation among study variables by gender

	Recent immigrant	School	P-PAI	A-PAI	P-Monit	A-Monit	F-use	Use
Recent immigrant	–	–0.06	–0.09	0.03	0.06	0.05	–0.15*	–0.04
School	–0.05	–	–0.15*	–0.09	–0.14 ⁺	–0.12	0.26***	0.13 ⁺
P-PAI	–0.14 ⁺	0.00	–	0.23***	0.20*	0.00	–0.07	–0.08
A-PAI	0.00	–0.12 ⁺	0.06	–	0.18*	0.47***	–0.11	–0.07
P-Monit	–0.06	0.11	0.17*	0.05	–	0.08	–0.05	0.00
A-Monit	0.00	–0.06	0.07	0.32***	–0.07	–	–0.18*	–0.16 ⁺
F-use	–0.14 ⁺	0.31***	0.05	–0.03	0.10	–0.03	–	0.45***
Use	–0.09	0.13 ⁺	0.00	–0.18*	–0.03	–0.04	0.54***	–

Note: Above diagonal: Correlation for males. Below diagonal: Correlation for females

School poor school functioning, P-PAI parental academic involvement parent report, A-PAI parental academic involvement adolescent report, P-Monit parental monitoring parent report, A-Monit parental monitoring adolescent report, F-use perceived peer substance use, Use early substance use

⁺ $p < .10$;
^{*} $p < .05$;
^{**} $p < .01$;
^{***} $p < .001$