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Parental Monitoring and Changes in Substance Use Among Latino/a and Non-Latino/a Pre-adolescents in the Southwest

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Abstract

The family is one of the most important contexts for children's development and well-being. Parents play a central role in the family, and the degree to which parents monitor their children's behaviors has been shown to be associated with fewer risky behaviors, especially substance use. Prior research on parental monitoring and substance use, however, has several limitations. Most studies have focused on older adolescents, as well as adolescents from primarily White, Euro-American heritage. Prior studies largely have been cross-sectional and unable to test if parental monitoring decreases substance use over time. This article explicitly addresses these limitations by examining a longitudinal sample of primarily Latino youth in pre-adolescence (5th grade). Using an Ecodevelopmental framework, we hypothesized that parental monitoring will be associated with lower levels of youth substance use and more beneficial substance use intentions, norms, and attitudes. We further hypothesized that the effects of parental monitoring may differ by gender and between Latino and non-Latino youth. The data came from a school-based randomized trial of a substance use prevention program in Phoenix, AZ. To test our hypotheses, we use regression models, with adjustments for clustering and multiple imputation of missing data. The results show that parental monitoring has significant beneficial and longitudinal effects on youth's substance use and related substance use intentions, norms, and attitudes. These beneficial effects of parental monitoring are invariant to the youth's gender or Latino ethnicity, except in the case of marijuana use: parental monitoring is significantly more effective in reducing girls' marijuana use.

Keywords

parental monitoring; Latino/a; pre-adolescence

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1. Introduction

Prior research has shown that parental involvement in adolescent lives, including monitoring, is a crucial factor in reducing the jeopardy of unhealthy and risky behaviors. This is possibly because parents often provide a positive and permanent influence in a developmental time in which there are many changes related to physical, social, and cognitive growth. Parental monitoring includes parent behaviors such as being aware of where children are, asking about what behaviors children engage in, and knowing the peers with which their children associate (Patterson & Stouthamer-Loeber, 1984). Parental monitoring also includes expecting children to call when they change their plans (Barnes, Hoffman, Welte, Farrell, & Dintcheff, 2006), and having an adult at home after school (Han & Woldfogel, 2007). Youths with higher levels of parental monitoring have lower risks for sexual risk-taking behaviors (Kerr, Beck, Shattuck, Kattar, & Uirburu, 2003, Borawski, Ievers-Landis, Lovgreen, & Trapl, 2003, Browning, Leventhal & Brooks-Gunn, 2005), externalizing problems (Pettit et al. 1999), susceptibility to peer pressure (Curtner-Smith & MacKinnon-Lewis 1994), and carrying handguns (Luster & Oh 2001, Yu et al., 2006).

Parental monitoring has also been found to impact youth's substance use. When youths have higher monitoring by parents, they have been found to have lower use of both legal drugs, such as tobacco (Dick et al., 2007) and alcohol, as well as illegal drugs, including marijuana, hallucinogens, cocaine, and barbiturates. (Barnes et al. 2006, Macaulay, Griffin, Gronewold, Williams, & Botvin, 2005). In addition to lower use of substances, youth with more parental monitoring have stronger personal norms against drug use (Macaulay et al. 2005), their social networks are less tolerant of substance use (Nash, McQueen, & Bray, 2005), and they are less likely to socialize with peers in situations in which substance use may occur (Beck, Boyle, & Boekeloo 2003).

Although prior work has established important connections between parental monitoring and substance use, several important issues remain unanswered. First, most studies of parental monitoring have focused on the majority, Euro-American, white population (Dick et al. 2007, Macaulay et al. 2005, Pettit et al. 2001). There are some notable exceptions that included Asian Pacific Islanders, African American, multiracial and White groups (Choi, Harachi, & Catalano, 2006; Barnes et al., 2006; Griffin, Botvin, Scheier, Diaz, & Miller, 2005; Barnes, Reifman, Farrell & Dintcheff, 2000). Some previous studies focusing on Latinos or including Latino sub-samples have looked primarily at delinquency (Cota-Robles, & Gamble 2006; Kerr et al., 2003). There are a number of recent studies which include Latino preadolescents and focus on parental monitoring and drug abuse but they tend to use small samples, be descriptive, or cross-sectional (Voisine, Parsai, Marsiglia, Kulis, & Nieri, 2008; Pokhrel, Unger, Wagner, Ritt-Olson, & Sussman, 2008; Parsai, Marsiglia & Kulis, 2008; Wagner, Ritt-Orlson, Soto, Rodriguez, Baezconde-Garbanti & Unger, 2008; Warren, Wagstaff, Hecht & Elek, 2008; Romero & Ruiz, 2007; Szapocznik, Prado, Burlew, Williams & Santisteban, 2007). Relatively little is known about how parental monitoring affects substance use across different subgroups and longitudinally as family strategies, norms, and processes differ. Our study addresses this gap with a focus on a longitudinal sample which includes a large number of Latino preadolescents as well as a lower number of Euro-American and African American students.

Second, parental monitoring may have differential effects on youth at various points across the life course. As youths mature, they test parental boundaries and gain independence as they transition from childhood, to adolescence, and to young adulthood (Dishion, Nelson, & Kavanagh, 2003). Adolescent risk behaviors increase in prevalence with age (Rai et al., 2003), and parental monitoring for a young child may have different consequences than

parental monitoring for an adolescent. Our design focuses on pre-adolescent youth at an important time of transition: fifth grade.

Third, although discussions of parental monitoring frequently suggest that it has a preventative effect in restraining risk behaviors, empirical studies seldom have addressed whether parental monitoring influences the future course of youth substance use. Prior studies have shown associations between monitoring and youth outcomes, but much of this work is cross sectional (Bahr, Hoffmann, & Yang, 2005, Wright & Fitzpatrick, 2004, Borawski et al. 2003). These designs may obscure the influence of monitoring by combining countervailing effects. While, for some youth, high levels of monitoring can reflect effective prevention against substance use, other youth may evoke reactive parental monitoring because they are discovered or suspected to have been using substances. Our study uses a multiwave design to test if parental monitoring is associated with subsequent changes in the levels of youth substance use over time.

2. Background

Ecodevelopmental Theory (Szapocznik & Coatsworth, 1999) focuses on the social environment in which the individual lives and the nature of interactions between family members. It has roots on Ecological Theory (Bronfenbrenner, 1979), which views the person's environment as having four levels: the macrosystem, which is composed of cultural views and ideas; the exosystem, which refers to environmental conditions that influence children indirectly; the mesosystem, which is comprised of the interactions in the person's life; and the microsystem, which refers to the most direct contacts in the individual's life (e.g. family, school). Since the microsystem is the closest to the individual, Ecodevelopmental Theory identifies the interactions that occur at that level as having great importance. For example, families are recognized as having the greatest influence in adolescents (Miller & Schiamberg, 2003). This theory emphasizes the role of family and has been utilized to analyze how the relationships between parents and adolescents over time affects the levels of parental monitoring (Liddle et al., 1998); and, how environmental risks and protective factors relate to adolescent problem behavior, including substance use (Szapocznik & Coatsworth, 1999). Coatsworth et al. (2000) argued that family practices including parental monitoring function as sources of risk or protection for developmental outcomes. The general assumption is that family members are interdependent and that they would act differently if they were living in isolation (Robbins, Mayorka & Szapocznik, 2003). This study uses Ecodevelopmental Theory as a framework to examine the longitudinal effects of parental monitoring on adolescent substance use. Ecodevelopmental theory provides the rationale for our focus on parental monitoring in the family (as the microsystem). The theory also motivates our focus on gender and ethnicity: embedded in the macrosystem are different gendered and cultural expectations that parents may have with regard to their monitoring of boys versus girls, and for Latinos versus non-Latinos.

There is a consistent pattern of results from previous studies that point to parental monitoring as a possible deterrent of adolescent substance use. In one study, adolescents who reported high levels of parental monitoring were less likely to use alcohol, other substances or engage in anti-social behaviors (Barnes et al., 2000; 2006). In another study of high school students, participants who reported excessive drinking also reported having parents who were permissive, and who did less monitoring of their activities (Arata, Stafford & Tims, 2003). Parental monitoring has also been found to deter or mitigate the levels of substance use among adolescents who associate with peer groups in which substance use is normative and pressure to use is high (Fletcher, Darling, & Steinberg, 1995).

Potential differences in levels of parental monitoring and how it operates across racial and ethnic groups are only starting to be examined. For example, Borawski et al., (2003) reported that negotiated unsupervised time was higher among White students than among African-Americans and Hispanics. In turn, more unsupervised time was associated with increased sexual activity and substance use, while higher levels of parental monitoring were associated with lower rates of substance use and sexual activity. Among Latino adolescents parental monitoring was found to be negatively associated with smoking (Shakib et al., 2003). Among Mexican-American male adolescents, parental monitoring was negatively associated with delinquency (Caldwell, Beutler, Ross, & Silver, 2006). Apart from these few studies, Latinos usually have been included in samples under the category of "other" along with such diverse ethnic groups as Asian Americans and Native Americans. This aggregation disregards the different histories, cultural values, and family structures among these ethnic groups, factors that may influence how parental monitoring operates.

It is important that research addresses the Latino family experience with parental monitoring, Latino adolescents' perceptions of parental monitoring, and the overall effect of monitoring on Latino adolescents' substance use. Parental monitoring could have a different impact among Latino families, compared to other groups, due to distinctive Latino cultural values. *Familismo* is the value of family closeness, both in social support and in proximity to extended members, which tends to characterize many Latino families (Cauce & Domenech-Rodriguez, 2002). Romero & Ruiz (2007) found in a study of Latino youth that the value of *familismo* was associated with higher parental monitoring and that both family closeness and parental monitoring were associated with less risky behaviors of youth. Kerr et al. (2003) in their study of Latina adolescents found that lack of family connectedness was a predictor of risky behavior.

Other Latino values that may affect parental monitoring are *machismo* and *marianismo*. These values reflect gender role differences. The *machismo* role is that of the provider and representative of the family to the outside world. It also reflects male bravado and risk taking. The *marianismo* role is that of the female nurturer and caregiver. The woman stays close to home while taking care of the children, elderly parents and housework (Cauce et al., 2002). Together these two values may create differences in parental monitoring for Latino boys and girls. Girls may be monitored more closely as they are expected to stay closer to home. Cota-Robles & Gamble (2006), in their study of Mexican American adolescents, found that girls did report higher levels of maternal parental monitoring than boys did. In addition, these gender differences in parental monitoring were found to have differential effects on substance use among Mexican American adolescents (Voisine, et al, 2008). By focusing on the role of Latino cultural values, these studies add to those employing general population samples that also have reported more parental monitoring of adolescent females than their male counterparts (Rai et al. 2003, Beck et al., 2003, Borawski et al., 2003)

Other important factors in the link between parental monitoring and substance use are family structure and adolescent age. Studies contrasting two-parent, single-parent, and non-biological parent households have explored the effect of family structure on substance use. Although some studies have reported that adolescents in one-parent families were more likely to use substances and engage in risky behaviors (Johnson, 1996), other studies that took into consideration the level of parental involvement (from both parents), regardless of the type of custody they hold, found no significant effects related to family structure (Garis, 1998). A more recent study of Mexican origin pre-adolescents living in a variety of family situations (single parents, blended families, nuclear families, and extended family members) report similar levels of parental monitoring and substance use for all participants (Warren, Wagstaff, Hecht, & Elek, 2008). The researchers argued that Mexican origin pre-adolescents

may benefit from cultural factors (such as *respeto* and *familismo*) that function as protections against substance use regardless of family structure.

Studies of developmental issues in the etiology of substance use suggest that pre-adolescence is a crucial period of initiation, and that Latino youth may be particularly at risk. Most of the prior literature has focused on older ages when levels of use are much higher, such as the mid- to late-teen years (Bahr, 2005; Borawski et al., 2003; Barnes and Farrel, 1992). Statistics for substance use among younger children vary across studies. A study of elementary school children reported that 9.8 % of fourth graders, 16.1% of fifth graders and 29.4% of sixth graders had used alcohol, and that 18.4% of the Hispanic children in the sample had used alcohol compared to 14.8% of Whites (Donovan, 2007). Somewhat higher prevalence was reported among Mexican American students specifically in 4th through 6th grades: 26% for lifetime use of beer and 24% for use of wine or liquor (Yin, Zapata and Katims, 1995). Finally, a study of fifth graders found that 27.8% of boys and 25.6% of girls had tried alcohol, 5.4% of boys and 6.4% of girls had tried cigarettes, and .9% of boys and 1% of girls had tried marijuana (Andrews, Tildesley, Hops, Duncan & Severson, 2003). Much of this early use may be random or sporadic experimental use and not yet the result of habit-forming behaviors or addiction (Kandel, 2002). There is, however, a large increase in substance use between fifth and sixth graders, suggesting that prevention efforts should target fifth grade. For example, one study reported that alcohol prevalence increased from 27.8 % to 47.9% between fifth and sixth grade among boys (Andrews et al., 2003).

Parents of elementary age children who are using substances may be unaware that substance use is occurring (Bush & Ionnotti, 1993). As a result, higher parental monitoring of elementary age school children might not translate into lower levels of use, because for young children, parents' monitoring behaviors might not be directed at preventing substance use, whereas parents of teens might have substance use explicitly in mind when they engage in monitoring of their children. Therefore, it is not well understood if parental monitoring of younger, pre-adolescent children will have preventative effects against substance use, even though parental monitoring may be stronger at that age than later in adolescence.

In sum, our hypotheses propose that higher parental monitoring will result in more beneficial outcomes for pre-adolescent substance use and related substance use intentions, norms, expectancies and offer vulnerability. We expect to observe the effects of parental monitoring across time—not merely in cross-section. We also hypothesize that the protective influence of parental monitoring may be more effective for girls than boys and more effective for Latinos than non-Latinos.

3. Methods

3.1 Data

The data for this study come from the first two waves of a randomized trial of a substance use prevention program in 30 public elementary schools in Phoenix, Arizona. The study schools, representing half of the school districts in the city, mostly serve lower income neighborhoods and all except two schools had majority Latino enrollments. Every 5th grade student in these schools was invited to participate in the study. Active parental consent and student assent were obtained from 82 percent of the eligible students in accordance with university and school district policies. The study included 2,034 fifth grade students who were surveyed at baseline in the fall of 2004, prior to the implementation of the prevention program in intervention sites (intervention and control sites were determined through block randomization at the school level). A follow-up survey was completed at the end of 5th grade, in Spring 2005, about two-months after the prevention program curriculum was

completed at the schools implementing the intervention. Any effects of exposure to the prevention program are controlled in the current analysis by entering a dummy variable covariate.

University-trained survey proctors administered one-hour, written questionnaires (provided both in English and Spanish) in the 5th grade classrooms. Students were informed that the survey was part of a university research project, their participation was voluntary, and their answers were confidential. Consented students who were absent on the initial survey date had the opportunity to complete the survey in class within a two-week follow-up period. Over 96 percent of the students with parental consent completed the questionnaire in the initial or follow-up survey process. The sample analyzed here includes data from 2,034 students who completed the study's baseline survey, before the prevention program was implemented in randomly assigned schools. Approximately 6 months after the pre-test, following the delivery of the prevention curriculum, a post-test survey was administered with identical measures of substance use outcomes. Over 89 percent (1,819) of the original respondents completed this post-test and their responses are used as outcomes in the current analysis.

3.2 Measures

The outcomes in this study are Likert-type measures of recent substance use, and substance use attitudes that are important antecedents of youth substance. The primary independent variable is a scale measuring parental monitoring. Control variables include gender, ethnicity, and prevention program treatment status. Additional demographic variables (self-reported school grades, a proxy for socioeconomic status, and family structure) serve as controls for individual risk and protective factors in youth drug use.

3.2.1 Alcohol, Cigarette, and Marijuana Use—The dependent variables are measures of recent substance use that were developmentally appropriate for this age group as shown in other studies (Flannery, Vazsonyi, Torquati, & Fridrich, 1994; Hecht et al. 2003; Kandel & Wu 1995). Recent alcohol, cigarette, and marijuana use was measured by questions that asked students to report "how many drinks of alcohol," "how many cigarettes," and "how many 'hits' of marijuana (pot, weed)," they had had in the last 30 days. Each of these questions allowed for Likert-type responses in seven categories, ranging from 1="none" to 7="more than 30" drinks of alcohol, 1="none" to 7="more than 20 cigarettes," and 1="none" to 7="more than 40 hits" of marijuana. These questions were posed identically in both the pre-test and post-test survey waves. The last 30 day time frame was chosen because recall and reporting of substance use has been shown to be more accurate for recent periods than over longer intervals (Johnston, 1989) and these intervals permitted assessments of changes in substance use from the beginning to the end of 5th grade.

3.2.2 Substance Use Intentions, Norms, and Attitudes—In addition to substance use frequency, we examined an array of drug use attitudes that have been identified as important factors in predicting youth initiation of substance use (Elek, Miller-Day, & Hecht, 2006). Five scales were created, measuring future intentions to use substances, pro-drug personal norms, parental injunctive norms (expected parental reactions to the respondent's use of substances), positive substance use expectancies, and drug offer vulnerability. Each scale had three items which were then averaged to form scales with good to excellent internal consistency (Cronbach's alpha coefficients of 0.80 to 0.97).

The substance use intentions scale included items where students indicated whether they thought they would use alcohol, cigarettes, and marijuana in the coming weekend if they had the chance (scored from 1="Definitely No" to 4="Definitely Yes"). The personal pro-drug

norms scale assessed whether students thought use of alcohol, cigarettes, and marijuana is "OK" for someone their age (scored from 1="Definitely not OK" to 4="Definitely OK"). Parental injunctive norms were measured by student reports of how angry their parents would be if they found out the student drank alcohol, smoked cigarettes, or smoked marijuana (1="Very angry," 2=" a little angry," 3="pretty angry," 4 ="Not at all angry" (Hansen & Graham, 1991). Positive substance use expectancies captured the perceived benefits of using substances: "Drinking alcohol makes parties more fun," "Smoking cigarettes makes people less nervous," and "Smoking marijuana makes it easier to be part of a group" (Hansen & Graham, 1991). Responses ranged from 1="Strongly disagree" to 4="Strongly Agree." Drug offer vulnerability assessed the students' degree of certainty they would say no if "a family member offered you alcohol," "a close friend offered you marijuana," or "a kid at school offered you a cigarette" (Kasen, Vaughan, and Walter, 1992). Each was scored from 1="very sure," 2="sure, 3="not sure, "4=not at all sure."

All outcome measures were scored or reversed in valence such that high values were undesirable, i.e. indicating higher levels of substance use or stronger pro-drug intentions, norms, or attitudes.

3.2.3 Parental Monitoring—Our primary independent variable is the level of parental monitoring reported by the student. This parental monitoring variable is a scale composed of five items that start with the preface, "How often does your mom or dad" engage in the following types of monitoring behaviors: 1) "know what you do with your free time," 2) "know what friends you spend your free time with," 3) "ask where you are going when you leave the house," 4) "usually know what you do after school," and 5) "tell you what time to be home." Responses to these questions were on an ordinal scale: (1) Never, (2) Sometimes, (3) Often, and (4) Always. The scale, computed as the average of the five items, had high reliability ($\alpha = .86$).

3.2.4 Ethnicity and Gender—An important aspect of the analysis is how the effects of parental monitoring vary across ethnicity and gender subgroups. Respondents self-reported their ethnicity by identifying the ethnic label that described them "best." In analysis we divide the students into four groups according to their ethnic self-identification in the pre-test: (1) those self-described as Mexican, Mexican American, Chicano, or another Latino or Hispanic group, (2) African American or Black, (3) White (non-Hispanic), or (4) Other, which combined small numbers of respondents who self-described as American Indian or Alaska Native, Asian or Pacific Islander, or an unspecified "other" ethnic category. A very large majority of the students were Latinos (79%) and this group was overwhelmingly of Mexican descent (97%). African Americans (8%) and non-Hispanic Whites (5%) were the only other ethnic categories in the sample with substantial numbers of respondents. The sample was gender balanced: just over half (51%) were female. Ethnicity and gender are treated in the analysis as dummy variables. Using non-Hispanic Whites as the omitted reference category, separate dummy variables are entered for Latinos, African Americans, and those of "Other" ethnicity. How the effects of parental monitoring vary by gender is another important concern, and thus we include a dichotomous gender variable, coded 1 if female, 0 if male.

3.2.5 Controls—In order to protect against spurious associations, we also include in our models a variety of control variables that may be related to our variables of interest. These control variables include the respondent's age, a proxy for SES, and self-reported grades. Although 96% of the respondents are ages 10 or 11, some students were age atypical for 5^{th} grade, ranging from 9 to 13 years old. Since both substance use and parental monitoring has been found to vary with age, the respondent's age is an important control. Socioeconomic status is measured as a dummy determined by whether the student receives a free or reduced

price lunch at school. Elementary school children are unlikely to have accurate knowledge of their parents' income or educational levels, but are likely to know if they receive a free or reduced price lunch. This lunch benefit is based on their family's economic status, and thus this measure has been used as a reasonable proxy of socioeconomic status in prior research. All but a small minority of the students were from low income families (91%) as indicated by their participation in the Federal school lunch program (Yes=1, No=0).

Finally, academic performance was measured with a question asking, "What grades do you usually get in school?" The response categories ranged from "Mostly A's," "A's and B's," "Mostly B's" through the lowest performance, which was "Mostly F's." This scale is coded from 1 to 9, with higher values representing higher academic performance. Exposure to the prevention program between the baseline and post-test survey was included as a dummy variable control, scored 0 for those in control schools and 1 for those in schools receiving the intervention.

3.3 Statistical approach

Our analytic strategy is to use the respondents' wave 1 level of parental monitoring to predict their wave 2 level of substance use. Models of substance use are estimated separately by substance: alcohol, cigarettes, marijuana, and inhalants. In addition to wave 1 parental monitoring, other predictors in the model include ethnicity, gender, controls, and the wave 1 level of substance use. Note that because we control for the wave 1 level of substance use, our models are predicting variation in substance use between waves 1 and 2. Aside from the main effects of parental monitoring, our hypotheses are also concerned with how the effects of parental monitoring vary by ethnic and gender subgroups. To test hypotheses concerning possible gender and ethnic group differences in the protective effects of parental monitoring, we estimate interaction models, adding additional variables to the models that are products of the main terms.

Additional analytic concerns are nested data and missing data. Because students were sampled within schools, they are not independent sample units, which violate standard regression assumptions. Typical consequences of ignoring this violation are biased hypothesis tests, often in the form of deflated standard errors and an increase in Type I error (incorrectly rejecting the null hypothesis). One way to adjust for clustering sampling is to estimate multilevel models (Raudenbush & Bryk 2002). We estimate random intercept models, which allow the intercept, or base, level of substance use to vary across the schools in the study. Therefore, if there are unobserved differences in the intercept level of substance use across schools, these differences will be incorporated in the model. We use SAS PROC MIXED to estimate our random intercepts models.

The second analytic concern is missing data. There are different types of missing data in the first two study waves. The first is item missing data: the respondent was present for the survey, but did not complete all the survey items in the questionnaire. The exact reasons for this missingness are unknown, but likely reasons include refusal to answer a question or respondent error (misinterpreting skip patterns; illegibly filling out the survey forms). The other type of missing data is due to attrition. Of the respondents to the first survey, 89% completed the second survey and the remaining were lost to attrition. Again, the reasons for each specific student's attrition are unknown, but typical sources of attrition are student absences or transferring to a different school that did not participate in the study. Students absent on survey day had an opportunity to complete the survey later during a follow-up period, and those who transferred to another school in the study were tracked accordingly so that student's participation was maintained. Thus the principle source of attrition was likely to have been school transfers out of the study schools. It can be vital to retain the information from these students because factors related to substance use and parental

monitoring may be implicated in the transfer. Although listwise deletion is typically used in the case of missing data, this approach has drawbacks if the missingness is not random. An alternative approach is multiple imputation. Multiple imputation techniques create multiple complete datasets, which are then analyzed using standard statistical methods. The multiple results from the statistical analyses are then combined to properly reflect the uncertainty in the imputed values. One assumption of multiple imputation methods is that, conditional on the observed values, the unobserved values are missing at random (MAR). Although this assumption cannot be tested, the assumption can be strengthened by including all relevant predictors of missingness in the imputation model. Therefore, in addition to the predictors in our models of substance use, we also include in the imputation model variables such as academic expectations and other background variables. We use SAS PROC MI to generate the 10 imputed datasets and PROC MIANALYZE to combine the results from the 10 analyses.

4. Results

4.1 Descriptive statistics

Table 1 shows descriptive statistics for the sample. Because we later test hypotheses across different subgroups, the descriptive statistics are presented separately by ethnicity and gender. These statistics show several notable patterns, and we focus on the outcomes and the main independent variable (parental monitoring). Although there are some exceptions, recent substance use (in the last 30 days) generally increases from wave 1 to wave 2. Of the 24 use trends (3 substances * 8 sex and ethnic groups = 24), 18 of the 24 demonstrate increases in use over time. Increases for most groups and substances are expected, as preadolescence is a time of experimentation. Even among these youth, who are only in 5^{th} grade, most experience increases from wave 1 to wave 2, a period of just 6 months. Trends in substance use intentions, norms, and attitudes are divided. Of the 40 trends here (5 intentions, norms and attitudes * 8 sex and ethnic groups= 40), almost half (19) see decreases, while the other half (21) have increases. This may be because intentions, norms and attitudes are more easily changed due to program effects, and thus these beneficial trends in intentions, norms and attitudes could be the result of exposure to the prevention program.

All groups average fairly high levels of parental monitoring on the 4 point scale—all are above 3. There are some subgroup differences: collapsed across ethnic group, parental monitoring is higher for girls than boys ($p<.001$). The finding that monitoring is higher for girls compared to boys agrees with prior literature that suggests there are significant gender differences in how parents monitor their children. Within ethnic group, however, this gender difference varies. For Latinos and Whites, girls have significantly higher parental monitoring ($p<.05$ for Latinos, $p<.001$ for Whites). For Blacks and other ethnic groups, there is no significant difference in level of parental monitoring for boys and girls.

4.2 Multivariate results

The multivariate results are shown in Table 2. These models use parental monitoring at wave 1 to predict wave 2 substance use, intentions, norms or attitudes. The wave 1 level of substance use, intentions, norms or attitudes is also controlled, and thus the coefficients for parental monitoring can be interpreted as affecting the change in the dependent variable from wave 1 to wave 2. Models 1 through 3 examine alcohol, cigarette, and marijuana use. For alcohol and cigarettes, there is a significant negative effect of parental monitoring. Marijuana use, in contrast, is not affected by parental monitoring, although it does approach significance ($p=.07$).

Models 4 through 8 examine the effects of parental monitoring on important precursors and mediators of substance use: intentions, norms, and attitudes regarding substances. Recall that these outcomes have been recoded so that lower values are more desirable so that the coefficients in these models can be interpreted similarly to the coefficients in the models for substance use. For each of these models, there are significant effects of parental monitoring in the desirable direction. Higher parental monitoring at wave 1 results in significantly lower predicted levels of intentions to use substances, pro-drug norms, favorable drug attitudes, and drug offer vulnerability at wave 2.

Although controls are not the focus of the analysis, we briefly describe their effects. In Table 2, better self-reported grades and being female tend to be protective in several models. Older age is a significant risk factor for use intentions and drug offer vulnerability. Two-parent families are significantly protective, but only for one outcome: parental injunctive norms.

Although Table 2 shows strong and consistent effects of parental monitoring across many outcomes, we also hypothesized that these effects may vary by gender and ethnicity. Table 3 tests the interaction of monitoring with gender. The prior literature—and our descriptive statistics—have found that girls report more parental monitoring than boys. Thus it is reasonable to expect that the impact of parental monitoring could be greater (more protective) for girls. We test this hypothesis by adding to our models an interaction between the female and parental monitoring variables. A significant negative coefficient would be consistent with greater protective effects of parental monitoring for girls. Models 1 to 3 present results for the substance use outcomes: alcohol, cigarette, and marijuana use. There are no significant interactions between gender and parental monitoring for alcohol or cigarettes, but there is a significant negative interaction for marijuana use. As expected, parental monitoring is more protective for girls. Recall that in Table 2, however, there was no effect of parental monitoring on marijuana use in the full sample of boys and girls. Taking these results together suggests that while parental monitoring has no effect on the marijuana use of boys, it does affect the marijuana use of girls. Thus marijuana use responds differently to parental monitoring than alcohol or cigarette use—for these latter two outcomes, parental monitoring is equally effective for boys and girls. For the remaining outcomes—substance use intentions, norms, expectancies and offer vulnerability—none of the interactions of parental monitoring with gender were significant (not shown). These results are not presented in order to simplify the tables and focus attention on the most salient outcome: substance use.

Table 4 examines interactions by ethnicity. Recall that we hypothesized that parental monitoring might be even more effective for Latinos, compared to other ethnicities, due to the greater familism, integration, and less tolerant drug attitudes among Latino families. The results in Table 4, however, do not support this hypothesis. None of the interactions between Latino ethnicity and parental monitoring are significant, suggesting than parental monitoring is as effective for Latinos as it is for the remaining racial and ethnic groups. Nor were there significant interactions between Latino ethnicity and parental monitoring for the substance use intentions, norms, expectancies, and offer vulnerability outcomes (not shown).

Lastly, in Table 5 we again test the interaction of parental monitoring and gender, this time focusing on the Latino sample. We hypothesized that these gender interactions might be even stronger in the Latino sample due to more gender segregation between boys and girls and the themes of *machismo* and *marianismo*. The results in Table 5, however, do not show a pattern of findings much different than Table 3, which examine the full sample. As in Table 3, the models in Table 5 show insignificant gender interactions for alcohol and cigarettes, and a significant interaction for marijuana. For marijuana, even the magnitude of the interaction coefficients is similar: −.072 in Table 5, compared to −.078 in Table 3. Thus

the greater protective benefit of parental monitoring on girls' marijuana use is similar among Latinos and non-Latinos. As in prior models, there were no significant interactions between gender and parental monitoring for the substance use intentions, norms, expectancies, and offer vulnerability outcomes (not shown).

5. Discussion

This study examined the longitudinal effects of parental monitoring on pre-adolescent's substance use and explored ethnic and gender differences using an Ecodevelopmental framework (Szapocznik & Coatsworth, 1999). The microsystem is the closest to the individual, and the interactions that take place in that system usually have a direct impact on the life of the person. Young people are especially susceptible to what occurs directly around them, and to the quality of the relationships they sustain with other family members. During this developmental age parents and guardians are very important in the lives of youth, because they can influence the youth decisions of staying away from risky behaviors. While parental monitoring is one family practice that has been found to have protective effects on youth substance use, the long term effects of monitoring have not been explored. Variations in the effects of monitoring by gender and ethnicity, focusing on Latinos, have also not received much prior research attention. The aim of this study was to fill this gap in the literature on parental monitoring and pre-adolescent substance use.

The study results suggest that parental monitoring may have long term effects on pre-adolescent's substance use. Higher levels of monitoring at the beginning of 5^{th} grade was a protective factor for boys' and girls' use of alcohol and cigarettes, and for girls' marijuana use, at the end of 5^{th} grade. Furthermore, parental monitoring also influences pre-adolescents' future substance use intentions, attitudes, and personal anti-drug norms.

When ethnicity was taken into account, all groups had high levels of parental monitoring, with Latino girls and White girls reporting the highest levels. These results differed from previous research that found higher levels of monitoring among Latino adolescents compared to other ethnic groups (Bulcroft et al., 1996; Varela et al., 2004). All parents limit the amount of freedom they grant their children at younger ages, while as the children get older monitoring tends to decrease (Li, Feigelman, & Stanton, 2000; Small, 1996). Some studies suggest that this decrease in parental monitoring may occur at different rates across ethnic groups (Loeber, Drinkwater, Yin, Anderson, Schmidt, & Crawford, 2000). So, it is possible that for older adolescents the levels of parental monitoring may look different when they are compared by ethnicity. For our young sample of 5^{th} graders, however, monitoring was high for all subgroups.

Most importantly, in the present study, the effects of parental monitoring on substance use were not different by ethnicity. This highlights the importance of parental monitoring for all pre-adolescents regardless of ethnicity. These results emphasize the role of parents in protecting their children from risky substance use behaviors.

Interesting results by gender were found regarding the effects of parental monitoring on marijuana use. It seems that parental monitoring may be less effective for boys than for girls' use of this substance. There are several possible reasons for these results. In general, parental monitoring was higher for all girls compared to boys. If parents are monitoring girls more than boys, they may also have more opportunities to talk about the dangers of drug use, or their personal norms related to drugs; however, parents may not necessarily talk specifically about alcohol and cigarettes as drugs, and while these substances may be excluded from the conversation, marijuana use may be purposely included; therefore, making very clear the idea that marijuana use is detrimental. Perhaps, girls are also more

receptive to the parent's anti-drug messages than boys. Earlier studies suggest that girls use drugs for different reasons than boys do, and therefore may be influenced by different anti-drug approaches (from parents, media, prevention programs) (ONDCP focus groups, Oct-Dec 1997).

Among Latino boys and girls, gender differences in marijuana use also increased over time. The girls had more modest increases of marijuana use than their male counterparts. In cross-sectional studies Latino girls were found to vary from Latino boys in the effects of monitoring for drug use (Voisine, Parsai, Marsiglia, Kulis, & Nieri, 2008). The traditional characterization of Latino females as nurtures and keepers of family traditions, and family unity, could protect Latino females through expectations that girls will keep close to home and closely supervised (Marsiglia & Holleran, 1999; Moon et al., 1999). Higher levels of parental monitoring among the Latino girls in this sample resulted in smaller increases of marijuana use, perhaps a reflection on cultural beliefs. Yet high parental monitoring was also significantly more beneficial for girls than boys among non-Latinos, as well. Reasons for these patterns may rest not in Latino-specific explanations, but in broader explanations of how boys and girls are differentially treated and monitored by their parents.

In summary, the results of this study contribute to the body of knowledge of parental monitoring and substance use by focusing in a younger population, by investigating the long term effects of monitoring, and by examining gender and ethnic differences. Controlling for substance use at time one, parental monitoring has protective effects at time two for all groups. Future studies might test how parental monitoring changes as children move from pre-adolescence into adolescence, and how these changes may differ by ethnic group.

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Table 1

Descriptive Statistics

	Latino		Black		White		Other	
	Boys	**Girls**	**Boys**	**Girls**	**Boys**	**Girls**	**Boys**	**Girls**
Wave 1 Parental Monitoring	3.23	3.41	3.20	3.28	3.13	3.56	3.15	3.16
Wave 2 Alcohol Amount	1.38	1.23	1.27	1.30	1.19	1.12	1.37	1.26
Wave 1 Alcohol Amount	1.33	1.16	1.17	1.14	1.28	1.08	1.43	1.23
Wave 2 Cigarette Amount	1.17	1.09	1.11	1.15	1.07	1.05	1.16	1.13
Wave 1 Cigarette Amount	1.12	1.05	1.05	1.01	1.12	1.00	1.26	1.06
Wave 2 Marijuana Amount	1.12	1.07	1.11	1.19	1.12	1.03	1.18	1.20
Wave 1 Marijuana Amount	1.10	1.04	1.20	1.00	1.07	1.00	1.23	1.03
Wave 2 Use Intentions	1.36	1.21	1.29	1.21	1.32	1.14	1.36	1.30
Wave 1 Use Intentions	1.30	1.20	1.23	1.18	1.28	1.22	1.34	1.31
Wave 2 Personal Norms	1.27	1.13	1.25	1.17	1.19	1.09	1.21	1.22
Wave 1 Personal Norms	1.27	1.18	1.16	1.14	1.24	1.13	1.40	1.24
Wave 2 Parental Norms	1.41	1.22	1.22	1.32	1.25	1.37	1.38	1.45
Wave 1 Parental Norms	1.39	1.29	1.41	1.20	1.34	1.13	1.59	1.42
Wave 2 Drug Expectancies	1.56	1.39	1.60	1.41	1.62	1.39	1.57	1.52
Wave 1 Drug Expectancies	1.47	1.38	1.50	1.51	1.46	1.41	1.73	1.39
Wave 2 Drug Offer Vulnerability	1.93	1.82	1.80	1.88	2.02	1.71	1.99	1.73
Wave 1 Drug Offer Vulnerability	2.09	1.86	1.84	1.71	1.96	1.51	1.94	1.86
Age at Wave 1	10.40	10.33	10.34	10.27	10.41	10.21	10.60	10.27
Free or Reduced Lunch	.92	.95	.81	.91	.77	.64	.85	.89
Usual Grades	6.56	7.08	6.92	7.42	7.20	7.08	7.11	7.01
Two Parent Family	.75	.75	.45	.45	.54	.77	.65	.63
In Prevention Program	.62	.62	.44	.51	.72	.62	.68	.64
N	798	817	77	92	61	39	62	88

Table 2

Effects of Parental Monitoring on Substance Use, Norms, and Attitudes

	Wave 2 Outcomes							
	Alcohol Amount 1	**Cigarette Amount 2**	**Marijuana Amount 3**	**Use Intentions 4**	**Personal Norms 5**	**Parental Norms 6**	**Drug Expectancies 7**	**Drug Offer Vulnerability 8**
Wave 1 Parental Monitoring	−0.067 * (−2.388)	−0.039 * (−2.045)	−0.031 (−1.820)	−0.082 *** (−5.257)	−0.069 *** (−5.023)	−0.089 *** (−3.744)	−0.075 *** (−3.927)	−0.081 * (−2.477)
Outcome Variable at Wave 1	0.338 *** (12.844)	0.306 *** (11.505)	0.372 *** (15.992)	0.276 *** (10.619)	0.195 *** (8.291)	0.157 *** (6.117)	0.204 *** (8.979)	0.197 *** (8.455)
Age at Wave 1	0.035 (1.112)	0.032 (1.415)	0.009 (0.398)	0.049 * (2.543)	0.022 (1.237)	0.031 (1.121)	0.041 (1.520)	0.126 * (2.542)
Female	−0.053 (−1.488)	−0.017 (−0.648)	0.005 (0.225)	−0.079 *** (−3.400)	−0.076 *** (−3.754)	−0.069 * (−2.214)	−0.119 *** (−3.983)	−0.022 (−0.419)
Free or Reduced Lunch	−0.063 (−1.019)	−0.065 (−1.469)	−0.020 (−0.481)	0.021 (0.509)	−0.015 (−0.409)	−0.033 (−0.593)	0.045 (0.842)	0.067 (0.686)
Usual Grades	−0.017 (−1.673)	−0.017 * (−2.146)	−0.006 (−0.841)	−0.026 *** (−4.266)	−0.016 ** (−2.619)	−0.045 *** (−4.759)	−0.021 * (−2.567)	−0.052 *** (−3.422)
Two Parent Family	−0.058 (−1.496)	−0.055 (−1.886)	−0.026 (−0.996)	−0.012 (−0.452)	−0.040 (−1.861)	−0.073 * (−2.081)	−0.009 (−0.256)	−0.023 (−0.374)
Latino †	0.153 (1.853)	0.080 (1.374)	0.007 (0.120)	0.036 (0.706)	0.061 (1.276)	0.015 (0.209)	−0.058 (−0.821)	−0.082 (−0.644)
Black †	0.151 (1.504)	0.079 (1.100)	0.056 (0.831)	0.009 (0.145)	0.072 (1.230)	−0.018 (−0.209)	−0.052 (−0.610)	−0.059 (−0.382)
Other Race/Ethnicity †	0.118 (1.117)	0.059 (0.806)	0.076 (1.126)	0.053 (0.854)	0.051 (0.868)	0.089 (0.979)	−0.013 (−0.146)	−0.097 (−0.613)
In Prevention Program	0.012 (0.319)	−0.023 (−0.830)	0.029 (1.000)	−0.002 (−0.063)	0.019 (0.716)	0.063 (1.949)	−0.008 (−0.197)	−0.063 (−0.907)
Intercept	0.827 * (2.267)	0.752 ** (2.840)	0.761 ** (3.076)	0.876 *** (3.914)	1.074 *** (4.933)	1.449 *** (4.577)	1.241 *** (4.071)	0.884 (1.588)
R-Square	.12	.09	.13	.15	.10	.09	.08	.07
N	2034	2034	2034	2034	2034	2034	2034	2034

* p<.05,

** p<.01,

*** p<.001, two-tailed tests

† Reference is White

Table 3

Gender Interaction Effects of Parental Monitoring on Substance Use

	Wave 2 Outcomes		
	Alcohol Amount 1	**Cigarette Amount 2**	**Marijuana Amount 3**
Female * Wave 1 Parental Monitoring	−0.041 (−0.851)	0.027 (0.804)	−0.078** (−2.716)
Wave 1 Parental Monitoring	−0.048 (−1.182)	−0.051 (−1.955)	0.004 (0.161)
Outcome Variable at Wave 1	0.339*** (12.868)	0.304*** (11.397)	0.375*** (16.096)
Age at Wave 1	0.036 (1.152)	0.032 (1.382)	0.011 (0.487)
Female	0.084 (0.509)	−0.106 (−0.953)	0.264** (2.717)
Free or Reduced Lunch	−0.065 (−1.041)	−0.064 (−1.440)	−0.024 (−0.575)
Usual Grades	−0.016 (−1.659)	−0.017* (−2.159)	−0.005 (−0.789)
Two Parent Family	−0.057 (−1.469)	−0.056 (−1.903)	−0.024 (−0.919)
Latino †	0.151 (1.826)	0.081 (1.395)	0.002 (0.045)
Black †	0.147 (1.463)	0.081 (1.131)	0.050 (0.743)
Other Race/Ethnicity †	0.113 (1.060)	0.062 (0.848)	0.067 (0.987)
In Prevention Program	0.012 (0.320)	−0.023 (−0.836)	0.029 (1.001)
Intercept	0.755* (1.989)	0.798** (2.904)	0.629* (2.459)
R-Square	.12	.09	.14
N	2034	2034	2034

* p<.05,

** p<.01,

*** p<.001, two-tailed tests

† Reference is White

Table 4

Latino/Non-Latino Interaction Effects of Parental Monitoring on Substance Use

	Wave 2 Outcomes		
	Alcohol Amount 1	**Cigarette Amount 2**	**Marijuana Amount 3**
Latino * Wave 1 Parental Monitoring	−0.035 (−0.543)	−0.027 (−0.627)	0.036 (0.960)
Wave 1 Parental Monitoring	−0.039 (−0.637)	−0.018 (−0.429)	−0.060 (−1.615)
Outcome Variable at Wave 1	0.338*** (12.836)	0.306*** (11.509)	0.372*** (15.988)
Age at Wave 1	0.035 (1.120)	0.033 (1.418)	0.008 (0.387)
Female	−0.053 (−1.481)	−0.017 (−0.640)	0.005 (0.214)
Free or Reduced Lunch	−0.060 (−0.965)	−0.063 (−1.419)	−0.023 (−0.541)
Usual Grades	−0.017 (−1.667)	−0.017* (−2.133)	−0.006 (−0.859)
Two Parent Family	−0.058 (−1.507)	−0.055 (−1.894)	−0.026 (−0.976)
Latino †	0.270 (1.207)	0.169 (1.105)	−0.111 (−0.821)
Black †	0.152 (1.516)	0.080 (1.114)	0.055 (0.811)
Other Race/Ethnicity †	0.122 (1.156)	0.061 (0.839)	0.072 (1.069)
In Prevention Program	0.013 (0.332)	−0.022 (−0.812)	0.029 (0.982)
Intercept	0.729 (1.734)	0.677* (2.209)	0.860** (3.193)
R-Square	.12	.09	.13
N	2034	2034	2034

*p<.05,

**p<.01,

***p<.001, two-tailed tests

†Reference is White

Table 5

Gender Interaction Effects of Parental Monitoring on Substance Use, Latino Sample

	Wave 2 Outcomes		
	Alcohol Amount 1	**Cigarette Amount 2**	**Marijuana Amount 3**
Female * Wave 1 Parental Monitoring	−0.023 (−0.398)	0.033 (0.807)	−0.072* (−2.464)
Wave 1 Parental Monitoring	−0.056 (−1.274)	−0.053 (−1.811)	0.015 (0.664)
Outcome Variable at Wave 1	0.369*** (13.602)	0.360*** (12.005)	0.449*** (19.402)
Age at Wave 1	0.052 (1.453)	0.033 (1.246)	0.012 (0.575)
Female	0.016 (0.084)	−0.140 (−1.023)	0.227* (2.315)
Free or Reduced Lunch	−0.062 (−0.781)	−0.043 (−0.767)	−0.054 (−1.132)
Usual Grades	−0.027* (−2.545)	−0.021* (−2.461)	−0.009 (−1.291)
Two Parent Family	−0.085 (−1.890)	−0.066 (−1.959)	−0.009 (−0.333)
In Prevention Program	0.018 (0.428)	−0.032 (−1.077)	0.016 (0.642)
Intercept	0.825* (1.980)	0.847** (2.717)	0.551* (2.130)
R-Square	.14	.12	.21
N	1615	1615	1615

* p<.05,

** p<.01,

*** p<.001, two-tailed tests

† Reference is White