

MAJORITY RULES? THE EFFECTS OF SCHOOL ETHNIC COMPOSITION ON SUBSTANCE USE BY MEXICAN HERITAGE ADOLESCENTS*

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This article examines key aspects of the school environment - its composition by ethnicity and acculturation - as important social contexts for understanding Mexican immigrant and Mexican American adolescents' drug use norms and behaviors. Results are presented based on surveys completed by Mexican-background students from 35 Phoenix, Arizona middle schools, whose enrollment ranged from a numerical minority to an overwhelming majority. Multivariate mixed models tested for the influence of school ethnic composition measures on substance use outcomes, while accounting for individual level predictors and for the nesting of data at the school level. The proportional representation of Latinos in the school was not a factor in an individual's drug use norms or drug use for the sample overall. Once students were broken down by acculturation status, however, ethnic composition had an effect. Less acculturated Mexican heritage students in schools with higher proportions of Latino students reported less substance use and less adherence to drug norms. Further investigation using other measures of ethnic composition suggested that these effects were attributable to the larger presence of less acculturated Latinos in the school rather than more acculturated Latino students. These school-level effects support the individual-level results indicating that less acculturated Mexican American students face less daunting substance use risks. The results suggest that ethnic group size, but not necessarily numerical predominance, matters and that within-group differences influence the effect of a particular ethnic group's presence in the school. In other words, the majority does not always rule. These findings are interpreted using the concepts of segmented assimilation and school-level social capital.

Because children spend large portions of their time at school, the school environment provides an important social context for them. Although some research has explored how schools' ethnic composition may structure the school environment and influence behavior, little attention has been given to the possible effects of school ethnic composition on substance use. Given that substance use varies by ethnicity (Wallace et al. 2003), it is possible that school ethnic composition operates through the school-level normative environment to influence individual youths' substance use.

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This study explores this possibility, testing whether and how Latino predominance in a school influences the substance use of Mexican heritage adolescents. We ask, does the majority rule?

EFFECTS OF SCHOOL ETHNIC COMPOSITION

School ethnic composition, as one aspect of the school environment, has received much attention as an influential factor on a variety of outcomes, such as children's self concept and social acceptance, academic achievement norms, academic performance, peer relations, ethnic identity, dropout rates and teenage fertility, victimization by peers, and drug use (Dutton, Singer, and Devlin 1998; Eschbach and Gomez 1998; Goldsmith 2003; Hanish and Guerra 2000; Kennedy 1995; Pelle bon 2000). The influence of school ethnic composition has been conceptualized in disparate ways. Some research has explored the effects of a mismatch between the individual's and the school majority's ethnicity (Kistner et al. 1993; Mayer 1991; Mpofu and Watkins 1997). According to the insulation hypothesis, a mismatch may have negative consequences. While youth in the majority experience widespread cultural reinforcement, a youth in the numerical minority will have to navigate through dissonant cultural environments and associated stresses (Rosenberg 1977). The same prediction is reached through an alternative perspective, the subjective culture hypothesis, which suggests that an ethnic mismatch may compromise outcomes for youths in the numerical minority because majority-group cultural expectations will be applied to the numerical minority, who may not understand them. Consequently, minority group members may be compared unfavorably to majority group members. In contrast to the previous two arguments, the bicultural competence hypothesis suggests that an ethnic mismatch may provide an opportunity for numerical minority youths to develop superior coping skills (La Framboise, Coleman, and Gerton 1993). It is argued that they will become more flexible and creative in handling difficult social situations.

Other research has focused less on the individual's experience (positive or negative) of ethnic dissimilarity and more on the ways in which school ethnic composition may influence students as a group. Goldsmith's (2003) study of academic achievement found that test scores for Latino students rose in schools with progressively higher proportions of Latinos, an effect that was largely attributed to the higher proportion of immigrant parents, who may more actively promote and effectively foster academic achievement. For some academic subjects, this positive effect of a higher proportion of Latino students extended even to African American and white students in the same schools. The proportional enrollment of African American students, however, had fewer effects and in the opposite direction, such as lower history and science scores in the most highly segregated schools (i.e., those more than 95 percent African American).

Studying academic norms, Kennedy (1995) tested the aggregation hypothesis that "peer norms which emerge in a school tend to accentuate the realities already present" (p. 6), such as when academic success is negatively sanctioned by peers because academic failure is common in the school. He found that the school's percent African American was the strongest and most consistent predictor of between-school differences in academic norms among students. As that percentage increased, on

average, students were less likely to feel that their peers would react favorably to their own academic achievement.

Research examining the effect of school ethnic composition specifically on substance use is limited, and it supports different conclusions. Cook, Ungemack, and Mark (2001) found that the incidence of inhalant use by African American and Latino students was twice as high in predominately white (non-Hispanic) schools compared to more ethnically heterogeneous schools. In addition, Latino youth were more likely to be smokers when they attended predominately white schools. These findings would support the notion that an ethnic mismatch can be disadvantageous, at least for some groups. However, the researchers also found that among all students, regardless of ethnicity, alcohol use was higher in predominately white schools and cigarette use was higher in ethnically heterogeneous schools. Like Goldsmith's work, these results suggest that school ethnic composition may influence a youth's outcomes independently of his /her ethnic concordance with the numerical majority.

Studies by Ennett and others (1997) and Kumar and others (2002) examined substance use as a dependent variable, although neither examined school ethnic composition specifically as a predictor. Ennett and others (1997) tested the contagion model of substance abuse that, like the aggregation hypothesis tested by Kennedy (1995), suggests that students within schools develop similar habits through the diffusion of prevailing norms. The researchers found that schools that were more prosubstance use at the aggregate (school mean) level had higher levels of lifetime alcohol, lifetime cigarette use, and current cigarette use. We know that youth substance use patterns vary by ethnicity (Wallace et al. 2003); therefore, we might hypothesize that the substance use patterns of one ethnic group may be contagious to other ethnic groups in a school.

Kumar and others (2002) used social learning theories (e.g., Bandura 1986) to argue that "adolescents acquire favorable attitudes toward substance use from friends and parents who either use these substances or express favorable statements and attitudes towards their use" (p. 107). The researchers distinguished between the more commonly studied influence of immediate peers such as close friends and influences through a broader peer context consisting of classmates (Hawkins, Catalano, and Miller 1992). They found that school-level disapproval of daily cigarette use, heavy drinking, and marijuana use was associated with lower probabilities of student's use of these substances, even among students who themselves approved of daily cigarette use. Although we know that youth friendships often form along ethnic lines, these results suggest that youths' substance use may be influenced by other peers at school, especially if those peers have substance use norms that predominate in the school (Daniel Tatum 1997).

ETHNIC COMPOSITION AND SOCIAL CAPITAL

Prior studies of the impact of school ethnic composition have followed psychological and educational models that emphasize either the individual-level consequences of an ethnic mismatch to the school's majority, or the macro-level diffusion of predominant norms. Both of these disparate approaches to understanding the relationship between school ethnic composition and individual behavior such as substance use are accommodated in a sociological model that views the school context as a source

of social capital. Defined by Stanton-Salazar (2004) as "a storehouse of different types of resources, embedded in social relations, that can be mobilized when an individual or group wishes to increase the likelihood of success in a purposeful action" (p. 25), social capital facilitates positive outcomes. Students bring to school social capital obtained through their families and communities, and they acquire additional social capital through their connections with school teachers, administrators, and peers.

The ethnic composition of a school influences the social capital available for exchange between students. Certain groups may have less social capital because they come from families and communities that lack social capital, making them more vulnerable to substance use. Through their association with others in the school, they either exchange antisocial (pro-drug) capital or fail to acquire less vulnerable peers' social (anti-drug) capital. Alternatively, they may succeed in acquiring social capital through their connections with groups with more resources, thereby averting substance use risk. These students, by virtue of their shared subordinate position in the power hierarchy, may find solidarity with each other, providing mutual support and exchanging resources to build the necessary social capital to avoid substance use (Stanton-Salazar 2004). The size of an ethnic group in a school, a youth's relationship to the group, and the group's drug-related capital have implications for how, whether, and what kind of capital will be exchanged and thus, how an individual's substance use behavior will be influenced.

SOCIAL CAPITAL AND SEGMENTED ASSIMILATION AMONG MEXICAN AMERICAN YOUTH

Among the important determinants of social capital is one's position within social networks, in which native-born whites usually experience an inclusion and sense of belonging denied to immigrants. For this reason, early urban theorists saw acculturation as the route to economic mobility and social acceptance for immigrants (Frazier 1957; Gordon 1964). Fortes and Zhou (1993) disputed the idea that assimila

tion into the cultural norms of the host country is a uniformly positive process, arguing instead that different conditions faced by immigrants should give rise to segmented forms of adaptation to the new country. In segmented assimilation, the more favored immigrants assimilate into mainstream cultural norms of the white middle class while others who face adverse conditions assimilate instead into the cultural norms of the underclass. A third type of adaptation is the retention of ethnic cultural traditions and close ties to co-ethnics and the country of origin (Portes and Zhou 1993).

Mexican immigrants have faced a hostile reception in the United States due to racism, shrinking economic opportunity structures, and economic competition (Fernandez-Kelly 1994). These adversities have given rise to ethnic communities that are socioeconomically homogeneous and low in economic resources, thus lacking in the ability to generate collective social capital. For the children of Mexican immigrants, their parents' adaptation to a new country often means growing up in poverty and being concentrated in inner city schools surrounded by peers who feel denigrated by society (Rumbaut 1994). These circumstances may create an oppositional culture among the second generation, in which drug use and delinquency fill the void left by the absence of conventional norms and achievements (Ogbu 1991; Fortes and Rumbaut 2001). In a California study of the children of immigrants, family poverty

and being the target of racial/ethnic discrimination were associated with low self-esteem, poorer school performance, weaker ethnic identity, and more family conflict, all of which are associated with more adolescent substance use (Rumbaut 1994; Vega and Gil 1999). In schools with a majority of more acculturated Mexican Americans, the less acculturated might either assimilate "down" into cultural norms favoring drug use, assimilate "up" into middle-class cultural norms espousing achievement and sobriety, or forego assimilation to retain traditionally Mexican cultural drug use norms.

There is evidence that the acculturation process itself places Mexican heritage youth at risk for greater substance use. Studies have shown that acculturation is associated with higher levels of delinquency and substance use and lowered educational aspirations (Samaniego and Gonzales 1999). It may produce stress from cultural conflicts or reinforce behaviors of mainstream Anglo culture (such as drinking among women) that are at odds with protective elements of the culture of origin (Beauvais 1998; Canino 1994; Vega et al. 1997). The migration experience can dislocate families and seriously limit their ability to rely upon relatives, *compadres* (ritualistic relatives), and friends (Menjívar 2000).

Finally, when children acculturate more quickly than their parents, family conflicts may ensue, and that mismatch in the pace of acculturation can also contribute to substance use risk (Vega and Gil 1999). School ethnic composition, if it entails large numbers of less acculturated youths, may moderate the pace of children's acculturation and the risk of substance use by creating opportunities for connections with peers who have substantial anti-drug social capital. In contrast, if school composition entails large proportions of highly acculturated ethnic groups, the pace of acculturation may accelerate, contributing to greater substance use risk.

MEXICAN CULTURE, ACCULTURATION, AND DRUG USE

Mexican heritage youth have a complicated mix of resilience and risk factors. On the one hand, they have several characteristics that operate to protect against substance use. One such characteristic is familism, a cultural orientation in which the family of origin is of primary importance, even after marriage. Studies have shown that Mexican and Mexican American families tend to have stronger family pride, family closeness, respect for parents, mutual obligation, trust, and cohesion than Anglo families (Chandler, Tsai, and Wharton 1999; Olson et al. 1983; Suarez-Orozco and Suarez-Orozco 1995). This family orientation is accompanied by greater parental monitoring and involvement with children, which can protect against substance use (Denner, Kirby, and Coyle 2001; Duncan et al. 1998; Flannery, Williams, and Vazsonyi 1999). Mexican American children have also been found to benefit from residence in relatively more cohesive neighborhoods (Gonzales 1993). Because many Mexican heritage youth are immigrants or from immigrant families, a sense of hope and expectation, commonly associated with recent immigrants, may also operate protectively for them (Portes and Rumbaut 2001). The retention of Mexican cultural traits by their families can constitute a more positive form of adaptation to the adversities of immigration, preventing the initiation of children into destructive oppositional culture (Portes and Zhou 1993). These cultural characteristics constitute

different forms of social capital that may be exchanged with peers in the school context and may transfer anti-drug normative influences to more acculturated peers.

Mexican heritage youths' substance use patterns reflect the mix of risk and resilience described above. Mexican American eighth grade students self-report higher use of marijuana, cocaine, crack, heroin, and steroids than white youth (Chavez and Swaim 1992). Like Mexican Americans at other ages, they report less frequent alcohol use than whites but a higher volume when they do drink (Randolph et al. 1998). Relative to their African American and white peers, Latino youth tend to have fewer peer models for beer and wine use but more models for pill use (Newcomb and Bentler 1986). However, among Latinos, Mexican Americans and Puerto Rican Americans have the highest rates of heavy drinking and alcohol-related problems (Cervantes et al. 1991). Similarly, while Mexican culture holds strong social norms against substance use by females, it tolerates heavy drinking by males (Canino 1994; Madsen and Madsen 1979). The gender gap in alcohol use for Mexican Americans narrows considerably as individuals become more acculturated, and among those of higher social class (Alaniz, Treno, and Saltz 1999).

These patterns highlight the unique profile of Mexican heritage youth and the need to understand the processes by which their protective normative influences are offset, making the youths vulnerable to substance use. Although studies have contrasted substance use in ethnically diverse versus white-dominated schools (Cook et al. 2000), research on the relationship between Latino school composition and substance use is notably lacking, as is research on schools in which ethnic minority groups constitute large numerical majorities.

Examining schools in which Latino students range from a small minority to a large majority, this study investigates their level of representation as a factor in the substance use of Mexican heritage adolescents. We anticipate that adolescents in schools with greater proportions of Latinos will report less drug use, an effect that can be attributed to the protective influence of Mexican culture at the school level. We further hypothesize that adolescents will report relatively less drug use and less adherence to pro-drug norms in schools with larger proportions of students who are non-English speakers at home. The lowered substance use risk may be due to fewer acculturative influences at the school level in such schools and, consequently, more gradual acculturation of Mexican heritage students, which has been shown to have fewer negative effects on the adoption of risk behaviors by youth from immigrant backgrounds (Gibson 1995).

METHODOLOGY

Data for the analysis came from a drug prevention study that surveyed students from 35 middle schools in Phoenix, Arizona, more than three-quarters of all such schools within the city's boundaries. The schools served primarily lower income, central-city neighborhoods, but they also included several schools located in wealthier, predominantly white areas. Within these schools, every student in seventh grade at the onset of the study was selected as a participant. Data were collected in fall of 1998, before a drug-use prevention curriculum was introduced in the schools. University-trained survey proctors administered a 45-minute questionnaire, written in English on one side and in Spanish on the other, outside the presence of regular

teachers. The surveys were administered during school hours in either a science, health, or homeroom class. Parental passive consent procedures were observed in accordance with university and school district policies. Proctors also informed students that the questionnaire was part of a university research project and gave guarantees of confidentiality. All students who were present on the day of survey administration agreed to complete the questionnaire. Sample sizes for individual schools ranged from 56 to 725 respondents. Aggregated across schools, an estimated 87 percent of the students officially enrolled in seventh grade at the study schools completed questionnaires.

Nearly two-thirds (65 percent) of the initial sample of 4,630 student respondents claimed a Mexican heritage, self-identifying as either "Mexican, Mexican American, or Chicano," and this subgroup comprised the sample in the analysis below. Among those excluded were non-Hispanic whites, about 16 percent of the original total sample, other Latinos (9 percent), African Americans (8 percent), Native Americans (2 percent), and Asians/ Pacific Islanders (1 percent).

The outcomes examined in this study were Likert-type items that measured the students' lifetime and recent substance use as well as adherence to pro-drug norms. The key independent variables were measures of the ethnic composition of the school they attended. Additional variables captured demographic information about the individual students, and these were used to control for individual level risk and protective factors in youth drug use (see Table 1).

SUBSTANCE USE OUTCOMES

The questionnaires assessed how frequently students had drunk alcohol, smoked cigarettes, and smoked marijuana in the past 30 days, as well as their lifetime amounts of use of each of those substances. Survey questions were chosen for their developmental specificity for the age group under study and their similarity to measures used in other large studies of early adolescent drug use (Flannery et al. 1994; Kandel and Wu 1995). To assess the lifetime amount of use, students indicated the number of alcohol drinks (from 1 = none to 10 = more than 100), cigarettes (from 1 = none to 10 = more than 20 packs), and hits of marijuana (from 1 = none to 8 = more than 40). Frequency of each of the three types of substance use was measured as the number of days of use in the last month (from 1 = none to 6 = 16 to 30).

The original Likert scale responses for these variables had skewed distributions toward low amounts and frequency of use. Although substantial minorities of the respondents reported some substance use, most of the substance users were not engaged in regular or heavy use. To improve the fit of multivariate models, we transformed all these substance use variables by calculating their natural log. An additional substance use variable was constructed to measure exposure to different types of substances. This variable was a simple untransformed count of the number of seven substances that the student reported ever having tried: alcohol, cigarettes, smokeless tobacco, marijuana, inhalants, "uppers" (e.g., speed, crystal meth), and other "hard drugs" (e.g., cocaine, crack, LSD, heroin). All of the substance use variables were scored such that high values were undesirable outcomes, indicating more use or more frequent use.

We created seven additive scales to measure respondent attitudes toward drug use including their approval of drug use by self and by others, future intentions to use drugs, expectation of injunctions by parents and friends in response to their own drug use, perceived positive consequences to drug use, and confidence in their ability to resist drug offers. Two of these scales measured personal norms: the students' opinions on whether use of alcohol, cigarettes, and marijuana is "OK" for someone their age, and whether it is "OK" for anyone to use "hard drugs" (LSD, crack, cocaine) or inhalants, all scored from 1 = definitely OK to 4 = definitely not OK. Drug use intentions were captured with three items gauging the likelihood that the student would refuse future drug offers of alcohol, cigarettes, and marijuana, each scored from 1 = definitely yes to 4 = definitely no. Anti-drug injunctive norms were measured in two separate scales focusing on the students' parents and friends. The respondents reported how angry their parents would be (from 1 = not at all angry to 4 = very angry), and how their best friends would react (from 1 = very friendly to 4 = very unfriendly) if they discovered the respondent was using alcohol, cigarettes, or marijuana (Hansen et al. 1988). Another scale based on six items (Hansen and Graham 1991), each scored from 1 = never, 2 = almost never, 3 = sometimes, 4 = often, to 5 = most of the time, measured positive expectancies of substance use, that is, viewing alcohol, cigarette, or marijuana use as having positive consequences, such as improving group acceptance, enlivening parties, having more fun, decreasing nervousness, sharpening concentration, and making food taste better. The final scale, based on Kasen, Vaughan, and Walter's (1992) self-efficacy scale, captured the respondents' confidence in their ability to resist substance use offers from a family member, from friends, and from a stranger, with each item scored from 1 = not at all sure to 5 = very sure.

The seven scales had good to excellent internal consistency (Cronbach's alpha coefficients of .75 to .86), and, after conversion to a common valence, they cohered around a single factor in a non-orthogonal factor analysis, with loadings ranging from .56 to .73. To improve measurement validity and provide a more economical presentation, we present results using the single factor score as a measure of the respondent's adherence to pro-drug norms, rather than presenting each sub-scale separately. In separate analyses of each of the seven scales comprising this factor score, which are not presented below, we found the same pattern of effects due to school ethnic composition as is shown in tables that are presented using the factor score.

SCHOOL ETHNIC COMPOSITION

We employed several measures of the ethnic composition of students at each school. The percent Latino was calculated from Arizona Department of Education's annual reports on the ethnicity and race of all enrolled students in the middle school during the semester in which survey data were collected. Official data on the breakdown of Latino students by nationality were not available; however, data from the study's individual student surveys indicated that 95 percent of the Latinos were of Mexican heritage. A second compositional measure was calculated from official information on the number of enrolled students who spoke a language other than

English at home, indicating the percentage of children in the school from less acculturated families. Although information for this measure could have included Asian, African and European immigrant families as well as American Indians whose home language was not English, nearly all of these students appeared to be from Latino families. The study's survey data indicated that 94 percent of those who said they mostly or exclusively spoke a language other than English at home were Latinos. Most of the other 6 percent identified themselves as non-Hispanic white or as Asian.

Additional measures of school ethnic composition were calculated from the survey data using a dichotomous measure of linguistic acculturation based on preferred language. Using the total number of respondents from all ethniracial backgrounds as a denominator, we calculated each school's percentage of respondents who were less acculturated Latinos (Spanish language dominant or bilingual), the percentage who were more acculturated Latinos (English language dominant), and the ratio of the number of less acculturated Latinos to the number of more acculturated Latinos. One outlier for this ratio, a school with seven times as many of the less acculturated Latinos than of the more acculturated Latinos was reassigned a ratio of 3:1 (the next largest ratio was 2.7:1).

INDIVIDUAL-LEVEL CONTROL VARIABLES

In multivariate analyses, several individual level predictors were entered to control for well known factors in youth drug use: academic performance, socioeconomic status, age, gender, and acculturation. The student's usual grades in school, on a Likert scale from 0 (mostly F's) to 9 (mostly A's), were a self-reported global assessment of academic performance. Socioeconomic status was measured with a dummy variable contrasting students who did and did not receive a free or reduced price school lunch. The student's age was measured in years based on the student's reported birth date. Students indicated their gender by marking male or female.

The sample's Mexican heritage respondents were broken down by a measure of their degree of linguistic acculturation into majority culture, as indicated by whether or not they used Spanish as their predominant language. Language dominance was determined by calculating the mean of two items asking about the language spoken with family and with friends, both scored 1 = Spanish only to 5 = English only. A cutoff of 3 was selected to dichotomize the mean score into less acculturated (less than or equal to 3) and more acculturated (greater than 3) respondents. The cutoff was criterion validated by examining the percentage of students who opted to complete the Spanish language version of the questionnaire. There were virtually no such students among those defined by the linguistic acculturation dichotomy as more acculturated (less than 1 percent) but a substantial proportion among the less acculturated (18 percent).

ANALYTIC STRATEGY

After presenting bivariate relationships with the substance use outcomes and attitudes and considering interrelationships among the school level ethnic composition variables, the key tests of the impact of ethnic composition were examined with multivariate mixed models (also called hierarchical or multilevel models). These

procedures addressed the hierarchical structuring of individual student data within schools to estimate fixed effects while accounting for random effects at the school level. Because the research design involved students who were sampled in schools, there was dependence between students in the same school, a violation of OLS regression assumptions that typically results in deflated standard errors, higher test statistics, and increased Type I error. We addressed these problems by explicitly modeling the hierarchical structure of the data with a random intercept mixed model (Raudenbush and Bryk 2002) that allowed the intercept to vary randomly across each of the 35 schools represented in the data. All school composition effects were examined after controlling at the individual level for academic performance (grades), socioeconomic status, age, gender and acculturation. School composition effects were examined for sub-groups of more versus less acculturated respondents, as well as in models that used interactions to assess whether school composition effects operated differently for those two groups. In models with interactions, school composition measures were mean centered. Our analyses investigated five different, although related, measures of Latino presence in the school ethnic composition. Although tabular multivariate results are presented for only two of these measures, results for the remaining measures are described in the text.

RESULTS

DESCRIPTIVE STATISTICS AND BIVARIATE CORRELATIONS

All outcomes and predictors (main effects only) examined in multivariate models appear in Table 1, with descriptive statistics reported at the individual level, using data from Mexican/Mexican American respondents only, and before performing any natural log transformations of variables. Alcohol was used both in larger amounts and more often than cigarettes or marijuana, with somewhat more frequent recent marijuana than recent cigarette use. The average Mexican heritage student had tried just over one of seven types of substances and was a 13-year-old, B+ student. The sample was gender-balanced, and 89 percent of the respondents were from families with incomes low enough to make the student eligible for the federal school lunch program. At the individual level, slightly more than half of the respondents were less acculturated (Spanish dominant or bilingual), and the remainder were more acculturated (English dominant) using the language preference dichotomy for acculturation status. A typical student attended a school in which nearly three-fourths of the students were Latino and over half spoke a language other than English at home.

Bivariate correlations with substance use outcomes showed strong and consistent relationships with individual level predictors. The respondents who were most likely to engage in heavier substance use and to adhere more to pro-drug norms tended to be older, male, poor academic performers, not participating in the school lunch program, and English language dominant. The school ethnic composition measures, however, were not strongly associated with substance use outcomes. Students from schools with higher proportions of Latino students reported somewhat less lifetime and recent use of cigarettes and marijuana; those in schools with larger proportions of students from non-English speaking homes reported slightly less frequent recent marijuana use and less adherence to pro-drug norms.

Correlations

TABLE 1

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DESCRIPTIVE STATISTICS AND SELECTED CORRELATIONS FOR DEPENDENT AND INDEPENDENT VARIABLES

Variable	N	Mean	S . D .	School			Gender	Spa.Dom. /Bilingual	% Latino	Eng at H
				Usual Grades	Lunch Program	Age				
<i>Outcomes</i>										
Alcohol lifetime amount	2988	3.31	2.41	-.17***	-.09***	-.07**	.13***	-.12***	-.02	-.01
Alcohol frequency last 30 days	2989	1.48	1.02	-.15***	-.09***	.04*	.04*	-.05**	-.01	-.02
Cigarettes lifetime amount	2999	2.34	2.05	-.18***	-.08***	.08***	.08***	-.11***	-.04*	-.02
Cigarettes frequency last 30 days	2999	1.27	0.82	-.14***	-.08***	.07***	.06**	-.04**	-.04*	-.02
Marijuana lifetime amount	2991	1.76	1.59	-.21***	-.08***	.08**	.09***	-.18***	-.04*	-.03
Marijuana frequency last 30 days	2981	1.37	1.04	-.19***	-.09***	.11***	.10***	-.12***	-.04*	-.04
# Drugs used	3017	1.22	1.60	-.21***	-.09***	.08***	.10***	-.14***	-.03t	-.02
Pro-drug norms factor score	2813	.00	.91	-.24***	-.11***	.09***	.18***	-.12***	-.03t	-.04
<i>School Level Predictors</i>										
School: % Latino	3015	72.55	17.99	-.06***	.29***	.01	.00	.18***		-
School: % non-English at home	3015	55.29	18.09	-.02	.25***	.01	.00	.22***	.81***	
<i>Individual Level Predictors</i>										
Usual grades	2989	6.41	1.83	-	-.01	-.09***	-.14***	.03	-.06***	-.02
School lunch program (Y = 1; N = 0)	3017	.89	.31	-.01	-	-.02	-.06**	.13***	.29***	.25*
Age	3017	13.05	.80	-.09***	-.02	-	.04*	-.04*	.01	.01
Gender (M = 1; F = 0)	2926	.51	.50	-.14***	-	-.06**	.04*	.00	.00	.00
Spanish dom./bilingual (Y = 1; N = 0)	3017	.56	.50	.03	.13***	-	-.04*	.00	.18***	.22*

†p < .10; *P < .05; **P < .01; ***P < .001

among the individual level predictors showed only small inter-relationships; in contrast, the school's percentage of Latino students was strongly related to the percentage non-English speaking at home.

SCHOOL AND NEIGHBORHOOD COMPOSITION

Although Latino students - overwhelmingly from Mexican backgrounds constituted the majority in most of the study schools, there were wide variations in the size of that majority and in the relative) mix of more and less acculturated students. Figure 1 presents data on different dimensions of the ethnic composition of each of the 35 schools after first sorting by the level of representation of Latino students. The proportion of students from Latino backgrounds ranged from 8 percent to 93 percent in official school enrollment reports, but over three-fourths of the schools had Latino majorities (27 of 35), and over half the schools were over 70 percent Latino (19 of 35). Two schools had non-Hispanic white majorities and one school had an African American majority. The five remaining schools were ethnically quite diverse, lacked an ethnic majority, and had roughly equal numbers of Latino, non-Hispanic white, and African American students. Combined, students of other ethnic backgrounds - Native Americans and Asian Americans - constituted no more than 18 percent of any school and comprised less than 5 percent of the student body in over two-thirds of the schools.

FIGURE 1
SCHOOL ETHNIC COMPOSITION IN 35 SCHOOL SITES

100
90
80
70 j
60 j
50 j
-School: % Latino
- School: % Non-English at Home
- - School: % Spanish Dominant or Bilingual Latinos - - - School: % English Dominant Latinos

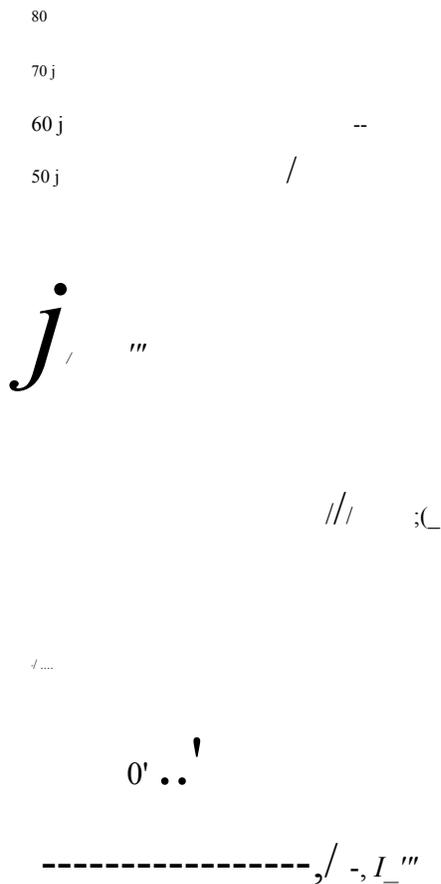


Figure 1 also breaks Latino enrollment down into less acculturated and more acculturated sub-groups. The ratio of less to more acculturated Latino students in schools varied markedly and in a somewhat systematic pattern relative to the size of the Latino majority. Similar results were obtained using either the official school reports of the percentage of students from non-English speaking homes or Spanish/Bilingual language preference as a measure of lower level of acculturation, which was calculated from each school's aggregated survey data. In schools that were 60 percent Latino or less, the percentage of less acculturated Latino students rose in step with the overall percentage Latino. In schools above 60 percent Latino in composition, however, the representation of less acculturated students first dropped and then recovered to earlier levels. More acculturated students tended to outnumber the less acculturated only in schools that had small Latino minorities, while the less acculturated outnumbered the more acculturated in schools with Latino majorities of 70 percent or more, which was over half the schools.

The schools in which the less acculturated outnumbered the more acculturated by the largest margin (70 to 80 percent Latino overall) were mostly from poorer areas of the city where ethnic minorities have traditionally lived. Neighborhood level data from the 2000 U.S. Census Summary Files, when matched to official school enrollment areas through GIS software, showed that the percent Latino in the school was positively correlated with the percentage of residents in the neighborhood of Mexican heritage ($r = +.95$), foreign born and living in the U.S. for 5 years or less ($r = +.60$), or from households with incomes under the poverty line ($r = +.70$). However, school ethnic composition was unrelated to neighborhood family structure (percent in single female-headed households), degree of residential mobility, and official crime rates.

Multivariate analyses utilized mixed models that account for random effects at the school level while controlling for individual level predictors of substance use outcomes. The results presented in Tables 2 and 3 employ two different measures of school ethnic composition as predictors of substance use outcomes: the overall percent Latino among enrolled students and the percent non-English speaking at home. These tables also include an interaction term that tests for differences in the influence of ethnic composition between less acculturated respondents (Spanish language dominant or bilingual) versus more acculturated respondents (English language dominant). Preliminary analyses (not presented) indicated that the school ethnic composition variables were significant predictors of nearly all of the outcomes but in opposing directions for sub-samples of less acculturated respondents versus more acculturated respondents. Less acculturated students reported more desirable outcomes (less substance use and weaker pro-drug norms) in schools with a larger proportion of Latino students and those with more students from non-English speaking families, while the more acculturated students tended to report less desirable outcomes in such schools. The fact that the effects for the two sub-groups worked in contrary directions accounts for another finding of the preliminary analyses, the lack of any significant main effects of school ethnic composition for the sample as a whole. The interaction terms in Tables 2 and 3 constitute a formal test of whether the impact of school ethnic composition differs for less acculturated versus more acculturated students.

Tables 2 and 3 include both school level and individual level predictors of substance use outcomes and norms. For six of the eight outcomes in Table 2 (all except

TABLE 2

SCHOOL COMPOSITION (% LATINO) AND INDIVIDUAL LEVEL PREDICTORS OF SUBSTANCE USE OUTCOMES

	Alcohol		Cigarette		Marijuana		Number of Substances Ever Used	P
	Lifetime Alcohol Amount	Frequency Last 30 Days	Lifetime Cigarette Amount	Frequency Last 30 Days	Lifetime Marijuana Amount	Frequency Last 30 Days		
<i>School Level Predictors</i>								
% Latino	0.001	0.002*	0.002	0.000	0.002†	0.001	0.004	0.003†
% Latino x Spanish Dominant or Bilingual	-0.002	-0.003*	-0.004**	0.000	-0.003*	-0.002*	-0.007*	-0.005**
<i>Individual Level Predictors</i>								
Usual grades	-0.053***	-0.034***	-0.060***	-0.028***	-0.064***	-0.040***	-0.161***	-0.037***
School lunch program (CY = 1; N = 0)	-0.190***	-0.142***	-0.136**	-0.100***	-0.126***	-0.112***	-0.398***	-0.037***
Age	0.082***	0.036**	0.099***	0.032**	0.087***	0.063***	0.212***	0.037***
Gender (M = 1; F = 0)	0.142***	0.013	0.082**	0.022	0.060**	0.057***	0.211***	0.037***
Spanish dominant or bilingual (CY = 1; N = 0)	-0.196***	-0.037*	-0.134***	-0.012	-0.208***	-0.096***	-0.401***	-0.037***
Intercept	1.045***	0.367***	0.630***	0.190***	0.450***	0.247***	1.508***	0.139†
-2 Restricted Log Likelihood	6492.7	3776.2	6016.5	2479.3	4876.1	3261.0	10686.4	6868.8
N=	2871	2872	2882	2883	2875	2865	2899	2730

† $p < .10$; * $p < .05$; ** $p < .01$; *** $p < .001$

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SCHOOL COMPOSITION (% NON ENGLISH SPEAKING AT HOME) AND INDIVIDUAL LEVEL PREDICTORS OF SUBSTANCE USE OUTCOMES

	Alcohol		Cigarette		Marijuana		Number of Substances Ever Used	
	Lifetime	Frequency	Lifetime	Frequency	Lifetime	Frequency		
	Alcohol Amount	Last 30 Days	Cigarette Amount	Last 30 Days	Marijuana Amount	Last so Days		
<i>School Level Predictors</i>								
% non-English at Home.	0.002t	0.002*	0.002	0.000	0.003*	0.001	0.006*	0.002
% Non-English at home x Spanish dom./bilingual	-0.003t	-0.004***	-0.003*	0.000	-0.004**	-0.005**	-0.009**	-0.006*
<i>Individual Level Predictors</i>								
Usual grades	-0.053***	-0.054***	-0.059***	-0.028***	-0.065***	-0.040***	-0.161***	-0.104**
School lunch program (Y = 1; N = 0)	-0.196***	-0.142***	-0.134**	-0.101***	-0.131***	-0.116***	-0.411***	-0.294**
Age	0.082***	0.035**	0.098***	0.032**	0.087**	0.063**	0.211***	0.116**
Gender (M = 1; F = 0)	0.141***	0.013	0.082**	0.022	0.059**	0.056***	0.210***	0.259**
Spanish dominant or bilingual (Y = 1; N = 0)	-0.198***	-0.037*	-0.137***	-0.013	-0.210***	-0.097***	-0.407**	-0.169**
Intercept	1.058**		0.368**	0.632**	0.192**	0.463***	0.252**	1.536***
-2 Restricted Log Likelihood	6489.7	3770.8	6018.9	2479.1	4869.0	3254.9	10682.6	
N=	2871	2872	2882	2883	2875	2865	2899	

t p < .10; * P < .05; ** p < .01; *** P < .001

lifetime alcohol and recent cigarette use), there is a significant interaction effect involving the school percent Latino and the dummy variable for whether or not the respondent is less acculturated. These interaction effects point in a consistent direction, indicating that the effect of Latinos' proportional representation depends on the individual's acculturation status. The main effect of the percent Latino predictor can be interpreted as the impact of higher levels of Latino representation specifically for more acculturated respondents, those coded zero on the variable for acculturation status. When it is significant, this main effect indicates that in schools with high percentages of Latino students, more acculturated students report higher levels of substance use and pro-drug orientations. The significant interaction effects indicate the opposite for less acculturated respondents, that is, relatively more desirable outcomes for them in heavily Latino schools.

In the second column of Table 2 both the main and interaction effect of school ethnic composition (percent Latino) are significant predictors of the frequency of recent alcohol use. The coefficient for the main effect means that, for an English language dominant student, each percentage point increase in school Latino composition increases the student's predicted score on the alcohol frequency scale by .002 points. In contrast, the interaction effect indicates that, for a Spanish language dominant student, each percent increase in school Latino composition results in a predicted decrease in alcohol consumption of $.002 - .003 = -.001$.

The individual level predictors in Table 2, entered as controls, show a nearly uniform pattern of statistically significant effects. Students who were older, male, more acculturated, higher in socioeconomic status (not participating in the school lunch program), and earning lower grades tended to report more substance use and stronger pro-drug norms.

Using another measure of school composition - the percent non-English speaking at home - Table 3 demonstrates effects like those in Table 2 but with significant effects across a more complete array of outcomes. The main effects of the school composition measure show that the more acculturated respondents are at slightly greater risk of alcohol, marijuana and multi-substance use when enrolled in schools with higher proportion of students from non-English speaking homes. The interaction effects then show a stronger opposing or protective effect among those who most likely make up the group that is not speaking English at home - Spanish dominant or bilingual Mexican descent respondents. For these less acculturated students, attendance at schools that have proportionally more children from non-English speaking families appears to lower their risk of using alcohol, cigarettes, marijuana, and multiple substances and decreases their espousal of pro-drug use norms. As in Table 2, this school-level influence operates even after controlling for the large and consistent effects of acculturation status and other risk factors at the individual level. Overall, the less acculturated respondents reported significantly less substance use and less adherence to pro-drug norms than did their English dominant counterparts. But these protective effects of lower acculturation appeared to be enhanced in schools with more Latinos and more students from non-English speaking homes.

We investigated three additional measures of school ethnic composition based on aggregated data from the student survey, rather than from official school reports, including: (1) the percentage of enrolled students who were Spanish dominant or

bilingual Latinos (less acculturated); (2) the percentage who were English dominant Latinos (more acculturated); and (3) the ratio of Spanish dominant or Bilingual to English dominant Latinos. For the first and third of these measures we found patterns of effects that echoed those found in Tables 2 and 3: apparently protective effects operating in schools with higher proportions of less acculturated Latinos but only for the less acculturated students themselves, not those who were more acculturated. We did not find any school level effects on any outcome that could be attributed specifically to the proportion of more acculturated Latino students in the school, not even for the more acculturated students themselves. School ethnic composition effects using these aggregated survey measures were not as strong as those based on official school reports in Tables 2 and 3.

DISCUSSION

Using a variety of measures of school composition, this study found a consistent pattern of findings: (1) Schools with higher proportions of Latino students were settings that produced an array of more desirable substance use outcomes for less acculturated Mexican heritage students. (2) These apparently protective effects were attributable more to the presence of less acculturated Latinos in the school than to the presence of those who were more acculturated. (3) However, the protective effects did not extend to more acculturated Mexican heritage students for whom higher ethnic representation was, in more scattered instances, associated with less desirable outcomes. In some ways, the protective school-level effect appeared simply to amplify the protective effects of lesser acculturation at the individual level.

In addition to indicating that the influence of school composition depends on the individual's acculturation status, the significant interaction effects can also be cautiously interpreted as demonstrating that the effect of an individual's acculturation status depends on a school's ethnic composition: The protective advantages of lesser acculturation tend to be magnified in schools with progressively larger shares of Latino students and those who are non-English speaking at home. The protection gap between those less and more acculturated appears to widen in schools with larger concentrations of Latinos, specifically, larger concentrations of less acculturated students.

The findings do not align perfectly with any of the hypotheses that have been advanced about the impact of school ethnic composition on social and cultural dynamics. Although we did not test the effect of a strict match/mismatch, the findings suggest that there may be some advantages of an ethnic/acculturation match for less acculturated Mexican heritage students, consistent with the insulation and subjective culture hypotheses. However, a similar effect for more acculturated Mexican heritage students was not found, perhaps for a variety of reasons. In schools with the highest proportions of more acculturated students, their less acculturated counterparts were nearly equally, or even more, numerous. Had the sample included a larger number of schools in which more acculturated Mexican heritage students were small numerical minorities in majority white schools, an effect due to their proportional representation may have appeared. Alternately, the dichotomous measure of linguistic acculturation may be insensitive to key cultural or social processes that are implicated in later stages of acculturation.

There was little evidence supporting the bicultural competence argument that more diverse social environments can improve outcomes for the numerical minority group. Although no negative outcomes were associated with being less numerous in a diverse school, the better outcomes were clearly associated with more homogeneous schools. Contrary to the predictions of segmented assimilation theory, higher concentrations of more acculturated Latinos at school neither diminished nor added to their already elevated degree of substance use risk at the individual level, and a high concentration of acculturated Latinos did not appear to "contaminate" the less acculturated students. Conversely, the more conservative drug use norms of less acculturated students did not appear to operate as a restraint on their more acculturated counterparts, even in schools in which less acculturated students constituted over half the enrollment. The seeming insulation of these two groups may be a reflection of power differences between newcomers and those more established in the community; it could also be viewed as an indicator of cultural differences between more- and less-acculturated Mexican Americans. Contrary to the predictions of the aggregation hypothesis and contagion theory, these findings suggest that the majority does not always rule. Numerical predominance alone does not guarantee a group's influence on the school context.

Another interpretation is that a threshold of representation is necessary for certain protective effects of traditional Mexican culture to operate. Even in schools that were the most overwhelmingly Latino, less acculturated students seldom accounted for much more than half the enrollment. The fact that log transformed and untransformed measures of ethnic composition produced similar results suggests that progressively larger shares of enrollment quickly reach ceiling levels in reinforcing protective cultural norms. Students may need a substantial presence to sustain the protective aspects of their culture, but it does not appear that less acculturated students have to be a large majority.

LIMITATIONS

The study's findings of school level influences of ethnic and acculturation composition need to be cautiously interpreted in light of certain limitations. The school-level effects were very small, and were neither as large nor as consistent as the individual-level predictors of substance use. As shown both in bivariate and multivariate results, the students reporting more substance use and stronger pro-drug norms tended to be more acculturated, as well as older, male, poor academic performers, and from higher income families. These individual level factors predicted substance use much more clearly and powerfully than school-wide social contexts.

Limitations of measurement, modeling, and generalizability also merit consideration. A more sophisticated multidimensional measure of acculturation, both at the individual and school levels, would be desirable. Although English language acquisition by children in non-English proficient families can lead to an erosion of protective family ties and reinforce behaviors of mainstream culture that cause value conflicts with the culture of origin, language preference may not capture important cultural and identity dynamics that mark later stages of the acculturation process (Vega et al. 1997).

The school ethnic composition measures were selected to address the predominance of Latino students in the sample schools. Limited variance did not permit us to investigate the impact of more complex measures of ethnic diversity that would take into consideration African American and other non-white students within the schools. A modeling limitation is the possibility that effects at the school level may be due to influences operating at other levels, such as within neighborhoods and families. While the sample included an ample number of schools to estimate school level effects, controls for influences at other levels were not possible.

CONCLUSIONS

The findings of this study suggest that ethnic group size, but not necessarily numerical predominance, matters and that within-group differences such as in acculturation influence the effect on substance use of a particular ethnic group's presence in the school. Social capital produced and exchanged in the school environment is not strictly determined by the majority group. This finding is consonant with Stanton-Salazar's (2004) claim that youths from marginal groups in society can find institutional support through the school by connecting with like peers who reinforce and expand their social capital. In this study, it appeared that the less acculturated Latino youths benefited from the substantial presence of like peers who may not only reinforce the anti-drug social capital obtained through family and community sources but also mitigate against the pro-drug normative influences of other more acculturated peers.

Future research is needed on the effect of an ethnic match of the student to the school ethnic majority. However, the present findings suggest that the definition of a match should go beyond ethnicity and account for within-group differences such as by acculturation. Additional study of school-level norms is needed to determine whether and how a school's ethnic composition influences its normative environment. Finally, more research is needed on cultural crossings from traditional Mexican to more mainstream culture. What conditions must be in place to retain cultural advantages as immigrant youth transition into English and higher levels of acculturation? This study suggests that an understanding of social context, rather than individual level risk factors in isolation, is needed to better understand how to enhance health outcomes for Mexican heritage youth.

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MAJORITY RULES?

393

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