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Perceived Ethnic Discrimination versus Acculturation Stress: Influences on Substance Use among Latino Youth in the Southwest*

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Abstract

Using a predominately Mexican-origin Latino sample of 5th grade students from the Southwestern United States, this study examined the relative effects of perceived discrimination and acculturation stress on substance use, and it assessed whether these effects were moderated by linguistic acculturation or time in the United States. Although rates of substance use were generally low in the sample, given the young age of the participants, over half (59%) of the sample perceived some discrimination, and almost half (47%) experienced some acculturation stress. Spanish-dominant and bilingual youth perceived more discrimination than English-dominant youth, whereas youth who have been in the United States five or fewer years perceived more discrimination than youth with more time in the United States. Youth who were Spanish-dominant or were recent arrivals experienced the most acculturation stress, with levels declining as linguistic acculturation and time in the United States increased. Multiple regression estimates indicated that perceived discrimination was associated with larger amounts and higher frequency of recent substance use and an array of substance use attitudes, such as stronger intentions to use substances, espousal of pro-drug norms, more positive substance use expectancies, and peer approval of substance use. Although acculturation stress was not associated with substance use, it was positively associated with several substance use attitudes, which are known antecedents of actual use. With a few exceptions, linguistic acculturation and time in the United States did not moderate the effects of perceived discrimination or acculturation stress.

Despite some downward trends in prevalence rates since the mid 1990s, substance use among youth remains a significant health problem in the United States (Johnston, O'Malley, and Bachman 2007). Rates of illicit substance use and alcohol abuse among middle school students have been consistently higher for Latino youth, relative to African American and non-Hispanic white youth (Marsiglia et al. 2004; National Institute on Drug Abuse 2003). According to data from the national Monitoring the Future study (Johnston et al. 2007), since 1992, Latinos, more

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so than any other race-ethnic group, have reported the highest annual rates of illicit drug use among eighth grade students, as well as higher rates of recent alcohol use, intoxication, and binge drinking. Yet heterogeneity among Latinos is such that some subgroups report low levels of use, suggesting that the distribution of risk and protection varies across subgroups (National Institute on Drug Abuse 2003). For example, immigrant and other less acculturated Latinos report low levels of substance use and appear to be protected by cultural factors that reduce exposure to substance use and pro-drug norms and promote pro-social behavior (Marsiglia et al. 2005; Kulis, Marsiglia, and Hurdle 2003; Marsiglia and Waller 2002). In contrast, American-born and -raised Latino youth who are highly acculturated have been found to have high rates of use, and many of them are at increased risk of substance use due to low educational attainment, limited economic opportunity, and social marginalization due their ethnic minority status (de la Rosa 2002; Delgado 1995).

Using a predominately Mexican-origin Latino sample, this study takes into account acculturative subgroup differences in exploring the relative effects of perceived discrimination and acculturation stress on youth substance use. These two stressors have been linked to negative behavioral and mental health outcomes in older youth and adults (Sellers et al. 2003; Pavalko, Mossakowski, and Hamilton 2003; Whitbeck et al. 2001; Vega, Gil, and Wagner 1998; Rogler, Cortes, and Malgady 1991), but their effects on substance use attitudes and behaviors among younger Latino preadolescents have not yet been studied. Although levels of substance use are typically low during preadolescence (Andrews et al. 2003), this developmental period is characterized by high rates of use initiation. Recent research on alcohol use shows that prevalence doubles between grades four and six, with the highest increase in prevalence between grades five and six (Donovan 2007). Although initial use is often experimental (Byrnes 2003), early use is associated with progression to problem use (CASA 2003) and use of more serious substances (CASA 1994). Preadolescence is also a key period for the emergence of pro-drug attitudes that frequently are antecedents to actual substance use (Elek, Miller-Day, and Hecht 2006). Personal norms endorsing substance use, peer approval of substance use, positive drug use expectancies, and intentions to use drugs have all been linked to higher risk of substance use among youth (Elek et al. 2006; Hansen and Graham 1991). Thus, an understanding of factors influencing preadolescents' substance use attitudes and behaviors is important for early prevention and intervention.

Perceived Ethnic Discrimination and Acculturation Stress

Racial-ethnic discrimination is pervasive in the United States (Kim and Lewis 1994; Feagin 1991; Telles and Murgía 1990), and it has adverse health consequences, including greater substance use, for people who experience or perceive they experience it (Liebkind, Jasinskaja-Lahti, and Solheim 2004; Turner and Avison 2003; Martin, Tuch, and Roman 2003; Mossakowski 2003; Sellers et al. 2003; Pavalko et al. 2003; Finch et al. 2001; Whitbeck et al. 2001; Finch, Kolody, and Vega 2000). As members of an ethnic minority group, Latino youth are vulnerable to discrimination. However, some Latino subgroups may be less likely to experience and perceive discrimination than others. Recent immigrants who have limited English proficiency may be unfamiliar with the American racial-ethnic hierarchy, have limited contact with other racial-ethnic groups, and thus perceive little discrimination. In contrast, highly acculturated youth raised in the United States may have greater familiarity with American culture, have greater interaction with youth from other ethnic groups, and consume English-language media containing negative stereotypes of their ethnic group. Thus they may be more likely to perceive discrimination. Research with older Latinos has shown, for example, that people who have spent a larger proportion of their life in the United States perceive more discrimination (Finch et al. 2000). More acculturated Latinos may be more likely than the less acculturated to cope with discrimination by using substances because their higher acculturation

level is accompanied by greater exposure to substances and weaker antidrug norms (Nieri et al. 2005; Kulis et al. 2003; Marsiglia and Waller 2002).

As with perceived discrimination, subgroups of Latinos are likely to vary in their experience of acculturation stress (Gil, Vega, and Dimas 1994). Acculturation is the process of cultural change that occurs as a person encounters a different culture (Berry 1997). Acculturation stress arises from the struggle to reconcile the culture of origin with the host culture (Berry 1994). Immigrant youth are vulnerable to acculturation stress because they have transitioned from one society to another through migration. Although native youth have the advantage of more extensive prior exposure to the new culture because they grew up in the United States, they, too, may experience acculturation stress. For example, native Latino youth with limited English proficiency may struggle to reconcile their Latino culture with mainstream American culture (Vega et al. 1998b). By restricting opportunities for bilingualism and biculturalism, American society's poor integration of these youth can lead to acculturation stress, often with grave consequences (Portes and Rumbaut 2001). Acculturation stress has been linked to poor physical and mental health outcomes (Finch, Frank, and Vega 2004; Finch et al. 2001), including substance use (de la Rosa 2002; Vega, Gil, and Kolody 1998; Vega et al. 1998b). Biculturalism has been associated with the experience of fewer acculturative conflicts (Gil et al. 1994), and is touted by some researchers to be protective for youth, regardless of their nativity (Portes and Rumbaut 2001; Vega et al. 1998).

Substance Use as a Coping Strategy

The potential of perceived discrimination and acculturation stress to affect health negatively may depend on the coping strategies employed by the individual. Coping strategies are cognitive or behavioral efforts to manage the demands of a difficult situation (Lazarus and Folkman 1984). Young people who employ ineffective coping strategies commonly have certain temperament factors, such as dysregulated moods, which are related to substance use (Swaim et al. 1989; Farrel and Danish 1993). Some youth perceive that substance use calms them down, cheers them up, or relieves boredom; so they use it as a coping strategy (Wills and Filer 1996). Youth who begin using substances at early ages are among those who appear most likely to use substances to cope (CASA 2003; Wright and Pemberton 2004).

The utilization of substance use as a coping strategy may be conditioned by an individual youth's acculturation level. For several reasons, more acculturated youth may be more likely than their less acculturated counterparts to employ the substance use coping strategy. Latino youth at higher levels of acculturation report greater normative approval of substance use (i.e., stronger pro-drug attitudes) and higher rates of actual substance use (Epstein, Botvin, and Diaz 2001; Harrison and Kennedy 1994; Kulis et al. 2003; Marsiglia et al. 2005, Marsiglia and Waller 2002; Nieri et al. 2005; Zayas, Rojas, and Malgady 1998). Through their greater proficiency in English, more acculturated Latino youth may be influenced more readily by pro-drug norms and pro-drug images in mainstream media, such as those depicting substance use as common (i.e., normal), sexy, and fun (Dalton et al. 2003). Thus, acculturation may facilitate substance use by fostering its acceptance. In addition, acculturation can broaden access to substances. For example, English language acquisition may encourage social networking with American natives who have higher rates of drug consumption and more permissive drug use norms (Escobar 1998; Warner et al. 2006). Furthermore, since immigrant children learn English faster than adults and maintain less of their language of origin (Portes and Rumbaut 2001), acculturation may also produce an acculturation gap between parents and children that undermines parents' ability to monitor and control their children's risk-taking behaviors (Escobar 1998). Finally, among some low-income, ethnic minority youth, higher acculturation has been associated with a heightened awareness of their disadvantaged ethnic minority status in the United States, and of the extent of ethnic discrimination, their internalization of ethnic

stereotypes and prejudices, and subsequent coping through substance use (Vega and Gil 1998).

Thus, to the extent that Latino youth perceive discrimination or experience acculturation stress, their choice of coping strategy may differ as a function of acculturation. More acculturated youth could be more likely to cope by using substances because they are more likely to accept substance use normatively, have more exposure to substance use and easier access to substance use opportunities, and have less effective parental monitoring of their activities. Put differently, acculturation may moderate the effects of perceived discrimination and acculturation stress on substance use. We anticipate, therefore, that among predominately low-income youth, more acculturated youth who perceive discrimination will exhibit stronger pro-drug attitudes and behaviors than less acculturated youth who perceive discrimination. Similarly, we anticipate that more acculturated youth experiencing acculturation stress will exhibit stronger pro-drug attitudes and behaviors than less acculturated youth experiencing similar stress. Other research has documented this pattern. Nieri and colleagues (2005) found that less acculturated youth with poor body image were less likely than their more acculturated peers to report substance use, despite the fact that the less acculturated youth reported worse body image.

Although we cannot test the mechanisms in the current study, an alternative to the coping model linking youth substance use to acculturation stress and perceived discrimination is a peer-focused model. Stress and discrimination are often accompanied by family conflicts (Birman 2006; Lau, Takeuchi, and Alegria 2006). These conflicts may accelerate youths' arrival at the peer-dominant developmental stage of adolescence by encouraging them to turn away from family and look to peers. Youths who experience discrimination or acculturation stress may seek ways to fit in with their peers and find that substance use garners them acceptance.

Acculturation, Perceived Discrimination, and Acculturation Stress

The research to date on perceived discrimination and acculturation stress has been helpful in providing evidence of their existence and effects. However, this literature has some limitations which must be addressed to arrive at a more complete theoretical picture. One problem with existing studies is that the items used to measure perceived discrimination and acculturation stress are often very similar, even though the underlying constructs are conceptually distinct. When a study on perceived discrimination and a study on acculturation stress each use similar measures, it is difficult to decide which construct the results represent. The measures lack the necessary detail to contextualize them.

In the literature on acculturation stress, perceived discrimination has been conceptualized and measured by some researchers as an acculturation stressor. Gil et al. (1994), in their study of Latino boys, treated perceived ethnic discrimination as one of five measures of acculturation stress; the remaining four measures were language conflicts, acculturation conflicts, perception of a closed society, and the perceived parent-child acculturation gap. An advantage of this approach is that the relative effects of perceived ethnic discrimination and the other stressors can be compared. However, a disadvantage is that discrimination due to immigrant status, which may be salient only to immigrants, is not captured and thus cannot be distinguished from ethnic discrimination, which may be salient to both immigrants and natives. Finch et al. (2000), in their study of Mexican-origin adults, also operationalized acculturation stress in part as discrimination. Their measure had three subscales: discrimination, legal status, and language conflict. They also included a separate measure of perceived discrimination, capturing perceptions of discrimination in daily life due to the person's Mexican origin. Unfortunately, there is insufficient detail in the published work on the wording of the acculturation-stress discrimination items to assess whether and how the two measures of discrimination in the analysis were different.

We attempt to avoid confusion in the present study by measuring perceived ethnic discrimination and acculturation stress as distinct conceptual realms, specifying in the language of the discrimination items that we are interested in ethnic discrimination, and using measures of acculturation stress whose details refer specifically to acculturation-related issues. Our measures of perceived discrimination make no reference to whether it was experienced as stressful, whereas the measures of acculturation stress capture stressful social conditions connected directly to acculturation and reported to be personally problematic.

Latinos cannot be treated as a homogeneous or monolithic ethnic group with respect to risk and protective factors for health outcomes (Page 2005). In addition to important differences by national origin, Latinos differ by generation status, linguistic acculturation, and time in the United States, and these differences have implications for substance use (Warner et al. 2006; National Institute on Drug Abuse 2003). We examine within-group differences among Latino youth systematically using two acculturation measures: (1) linguistic acculturation and (2) time in the United States. In addition to controlling for the main effects of these variables on substance use-related outcomes, we also examine whether these two acculturation measures moderate the effects of perceived discrimination and acculturation stress through some interactive process.

The study's central aim is to contrast the effects of perceived discrimination and acculturation stress on substance use outcomes, and to explore how those effects may vary according to the acculturation status of Latino preadolescents. We expect that perceived discrimination and acculturation stress will independently promote pro-drug attitudes and behaviors, and that both of these effects will be stronger for more acculturated compared to less acculturated youth. We view both perceived discrimination and acculturation stress as chronic stressors, and utilize measures that gauge general exposure to these stressors rather than acute, time-delimited exposure. Prior research has shown that status variations in stress exposure may be underestimated by narrow life events measures; thus, such status variations are better examined using broader measures of chronic stressors (Turner and Avison 2003). By using measures that capture chronic stress associated with perceived discrimination and acculturation, this study aims to enhance our understanding of the relationship between stress and substance use and to contribute important information to the larger body of literature on the social causes of illness.

Data and Methods

Sample

Data came from 5th grade students at 30 elementary schools in fall 2004 in Phoenix, Arizona. The schools were part of a randomized trial of a substance use prevention program that recruited half of the school districts and elementary schools in the city. The study schools mostly serve lower-income neighborhoods, and all except two schools had majority-Latino enrollments. Every 5th grade student in the schools was invited to participate in the study. Active parental and student consent were obtained in accordance with university and school district policies from 82 percent of the eligible students. University-trained survey proctors administered a one-hour written questionnaire (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. Consenting students who were absent on the initial survey date were able to complete the survey in class within the subsequent two-week period. A total of 2,034 students completed the questionnaire during this two-week period, representing over 96 percent of students with parental consent and 79 percent of all enrolled students.

The sample analyzed here includes data from 1,374 self-identified Latino students who completed the baseline survey, before the prevention program was implemented in randomly

assigned schools. The baseline data provide information on the two key independent variables: perceived ethnic discrimination and acculturation stress. The vast majority of students were of Mexican heritage (93%) and from immigrant families with one or both parents born abroad (82%). Given that the sample of youth is overwhelmingly of Mexican heritage and there are very small numbers of youth whose families originated in nations other than Mexico, we did not attempt an analysis by national origin subgroups.

The study outcomes are Likert-type measures of substance use behaviors and attitudes. The major independent variables are scales measuring acculturation stress and perceived ethnic discrimination. Measures of acculturation status are employed as moderating variables. Demographic variables serve as controls for individual risk and protective factors in drug use.

Outcome Variables

The study examined eight substance use-related outcomes, half measuring substance use behaviors and half measuring pro-drug attitudes. The questions were developmentally appropriate for this age group as shown in other studies of early adolescent drug use (Hecht et al. 2003; Kandel and Wu 1995). Students reported the number of times in the last 30 days they had “drunk more than a sip of alcohol,” “smoked cigarettes,” “smoked marijuana (pot, weed),” and “sniffed glue, spray cans, paint or other inhalants to get high,” providing responses in seven categories (0, 1–2, 3–5, 6–9, 10–19, 20–39, and 40 or more times). Because these measures were somewhat positively skewed, we ran exploratory analyses with logged versions to minimize effects of skewness and found the results to be similar to those obtained when using the original version. Therefore, we present the results of the untransformed measures.

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 et al. 2006). We created four scales to measure: (1) substance use intentions, (2) pro-drug personal norms, (3) positive substance use expectancies, and (4) peer approval of substance use. Each scale had three items referring in turn to alcohol, cigarettes and marijuana, which were then averaged to form summary scales with good to excellent internal consistency (Cronbach's alpha coefficients of .80 to .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 (from 1 = “definitely no” to 4 = “definitely yes”). The pro-drug personal norms scale assessed whether students thought use of alcohol, cigarettes, and marijuana is “OK” for someone their age (from 1 = “definitely not OK” to 4 = “definitely OK”). The positive substance use expectancies scale captured the perceived benefits of using substances (Hansen and Graham 1991): “Drinking alcohol makes parties more fun,” “Smoking cigarettes makes people less nervous,” and “Smoking marijuana makes it easier to be part of a group.” Responses ranged from 1 = “strongly disagree” to 4 = “strongly agree.” Finally, the peer approval of substance use scale measured student reports of how their best friends would react if the respondent got drunk, smoked cigarettes, and smoked marijuana (from 1 = “very negatively” to 3 = “no reaction” to 5 = “very positively”). All outcome measures were scored such that high values indicate more frequent substance use or stronger pro-drug attitudes.

Independent Variables

The key independent variables—perceived ethnic discrimination and acculturation stress—were scales created for this study based on measures used by Mena, Padilla, and Maldonado (1987), Romero and Roberts (2003), and Vinokurov, Trickett, and Birman (2002). The perceived ethnic discrimination scale had five items with responses ranging from 1 = “strongly disagree” to 4 = “strongly agree”: (1) “People don't like me because of my ethnic group,” (2)

“Kids at school say bad things or make jokes about me because of my ethnic group,” (3) “Kids my age exclude me from their activities or games because my ethnic group is different,” (4) “People think my English is bad,” and (5) “Kids like me, who are from my ethnic group, can't get good grades at school.” Acculturation stress was measured by a seven-item scale. Students indicated whether a particular acculturation-related situation was a “big problem” (coded 3), “a small problem” (2), or “not a problem” (1) for them. The items included: (1) “I get upset at my parents because they don't know American ways,” (2) “My family thinks I'm becoming ‘too American,’” (3) “I don't feel at home here in the United States,” (4) “I am embarrassed by the way I speak English,” (5) “I don't look like I belong in this country,” (6) “I argue with friends because we are from different cultures,” and (7) “My teachers don't understand my culture.”

Higher values on these scales indicate more perceived discrimination and greater stress, respectively. Both scales had acceptable internal consistency (Cronbach $\alpha = .85$ for perceived discrimination and $\alpha = .69$ for acculturation stress). A principal components factor analysis of all items from the two scales produced two distinct factors and no evidence of cross-loadings. Acculturation stress items clustered on one factor with loadings of .52 or higher, and perceived discrimination items clustered on a second factor with loadings of .69 or higher. Essentially similar results emerged using alternate factor analysis solutions and rotation methods.

Two measures of acculturation were included in the analyses. The first was linguistic acculturation, which, although it represents only one dimension of acculturation, has been shown to be comparable to multidimensional measures (Rogler et al. 1991). Linguistic acculturation was measured by averaging two questions where students reported the language they usually spoke with family, and usually spoke with friends, with responses coded 1 = “Spanish only,” 2 = “mostly Spanish,” 3 = “both Spanish and English,” 4 = “mostly English,” and 5 = “English only.” The sample was divided by trichotomizing the resulting scale to distinguish among Spanish-dominant, bilingual, and English-dominant youth. Youth were considered Spanish-dominant if the scale average was less than 3, bilingual if between 3 and 3.99, and English-dominant if 4 or higher. The second measure of acculturation was a single item ordinal variable capturing the respondent's length of residence in the United States, scored from 1 = “less than a year” to 5 = “all my life.”

Nativity was a dichotomous variable indicating whether the student was foreign-born (coded 1) or born in the United States (0), based on student reports of their country of birth. Although nativity was related to years of residence in the United States, there was significant variation in length of U.S. residence among both the foreign-born and U.S.-born. Nearly a quarter of the U.S.-born students (23%) had lived less than their entire lives in the United States, and over 13 percent of the foreign-born had lived more than 10 years in the United States.

Age was self-reported in whole years. Gender was dichotomous, female (coded 1) versus male (0). Participation in the school's federal free or reduced price lunch program served as a proxy measure of individual socioeconomic status: 0 = not participating, 1 = reduced-price lunch, and 2 = free lunch. Usual grades received in school, a common predictor of substance use (Wright and Pemberton 2004), was measured using an ordinal variable with responses ranging from 1 = “mostly Fs” to 9 = “mostly As.”

Analytic Strategy

We used multiple regression techniques to analyze the variables. After conducting descriptive analyses, first we examined the effect of perceived discrimination, controlling for the two measures of acculturation (language use and time in the United States), usual grades, and demographic characteristics. Second, we examined the effect of acculturation stress, with the same controls. These two models enabled us to assess whether perceived discrimination or

acculturation stress were related to the outcomes. Third, we examined perceived discrimination and acculturation stress simultaneously to determine whether each had a significant effect net of the other. Finally, in four separate models using mean centered interaction and main-effects terms, we examined the extent to which the two measures of acculturation moderated the effects of perceived discrimination and acculturation stress on substance use behaviors and attitudes. We ruled out possible collinearity among the various independent variables by assessing variance inflation factors, which for the variables in these models were well below 5 (maximum = 3.3, and most were close to 1). We also conducted sensitivity analyses, estimating alternate models (e.g. zero inflated negative binomial models) that adjusted for skewed distributions in the substance use behavior outcomes.

Results

Descriptive statistics for variables used in the analyses are presented in Table 1. Means for the recent substance use outcomes show that alcohol was used most frequently in the last 30 days, followed by inhalant, cigarette, and marijuana use. This pattern corresponded to the lifetime prevalence of self-reported substance use (data not presented in tables). Thirty percent of the sample reported that they had at some point in their lifetime used alcohol, cigarettes, marijuana, or inhalants. The most commonly used substance was alcohol, used by over a quarter of the students (26%), followed by inhalants (11%), cigarettes (8%), and marijuana (5%). Statewide surveys of 3rd through 6th graders in Arizona have reported rates of alcohol use prevalence ranging from a low of 20 percent in 1997 to a high of 39 percent in 1991 (Donovan 2007). The prevalence of alcohol use among our study participants is thus consistent with other communities in the state. We did not find comparable state level data for substances other than alcohol for this age group.

Measures of substance use attitudes varied more widely than actual substance use. Respondents were more likely to view their peers as approving of substance use, or that substance use had some positive consequences, than to approve of their own substance use or to indicate they were likely to use a substance if given the chance. The proportion indicating a pro-drug response on any item forming these scales was, respectively, 23 percent (peer approval of substance use), 19 percent (positive drug expectancies), 5 percent (personal norms), and 5 percent (use intentions).

Table 1 also shows that, in terms of linguistic acculturation, the largest group in the sample was bilingual (using English and Spanish equally). However, in terms of time in the United States, the majority of students (58%) reported living in the United States their entire lives. This suggests that the bilingual group is diverse, including immigrant and native youth as well as foreign-born youth who have lived the majority of their lives in the United States.

The respondents' ages ranged from 9 to 13, but 96 percent were 10 or 11, the typical age for 5th grade. Just over half (51%) of the sample was female. Most students were from low income families and participated in the federal school lunch program (93%). More than one-fourth (27%) of the students were immigrants, born outside the United States. About 15 percent of respondents were born in the United States but lived abroad for some period of their lives. The remaining 58 percent were native born and had resided all their lives in the United States.

Because the perceived discrimination and acculturation stress scales covered different ranges and had different response anchors, it is difficult to compare their means in Table 1 meaningfully. The distributions, however, showed that large numbers of students reported experiencing both of these stressors. Over half (59%) perceived some discrimination, and almost half (47%) reported some acculturation stress. The last columns of Table 1 show the correlations between these two stressors and the study's outcomes and other variables.

Beginning with the control and moderator variables, the correlations with measures of acculturation were contrary to expectations for perceived discrimination. Spanish-dominant and recently-arrived youth reported the highest levels of perceived discrimination, while English-dominant and life-long U.S. residents reported the lowest levels. Consonant with our expectations, the more acculturated students—both linguistically and in terms of longer U.S. residence—reported the lowest levels of acculturation stress. Additional tests for significant differences by acculturation status in perceived discrimination and acculturation stress using analysis of variance confirmed the trends shown in the correlations.¹

The correlations between the substance use outcomes and the two main independent variables showed a consistent relationship with perceived discrimination: Students with higher levels of perceived discrimination reported more frequent use of all four substances and stronger pro-drug intentions, personal norms, expectancies, and peer approval of use. Outcomes were less strongly and less consistently related to acculturation stress, which was significantly correlated with more frequent cigarette use but not the use of other substances, and with stronger pro-drug orientations on intentions, norms, and expectancies.

Perceived discrimination and acculturation stress were positively but only moderately correlated, providing additional evidence that, as measured here, the two constructs were distinct.

Multivariate Results

There were four sets of multiple regression models, each of which examined all eight substance use-related outcomes. The first set of models included as independent variables only perceived discrimination and the controls, and the second set included only acculturation stress and the controls. These results were consistent with the correlation results and are not presented here. The third set of models (Table 2) included perceived discrimination and acculturation stress as simultaneous independent variables and assessed the effect of each, net of one another and the control variables. Before detailing these results in a series of tables, the summary findings from these models can be highlighted. When entered together, the coefficients for perceived discrimination and acculturation stress generally diminished slightly in size compared to models where they were entered singly; the effect of perceived discrimination on all outcomes remained significant and in the same direction; and the effect of acculturation stress remained significant for substance use intentions, personal norms, and drug expectancies, but not for recent cigarette use. The changes in effects suggested that the impact of acculturation stress on cigarette use is at least partially mediated by perceived discrimination. Inspection of the standardized regression coefficients (not presented in tables) showed that for outcomes where there were significant effects of both the key independent variables, perceived discrimination, relative to acculturation stress, had larger standardized coefficients and thus a stronger association with the outcomes.

Results for the other variables in the models indicated that age and socioeconomic status (as measured by school lunch program participation) did not predict any of the outcomes. Gender

¹Using ANOVA and the modified Schaffer method to control for the family-wise Type 1 error, we made pairwise comparisons among the three categories of linguistic acculturation and three categories of time in the United States (recent arrivals in the United States 5 years or less, later arrivals, and lifetime residents). Results were similar using both acculturation measures: less acculturated students reported higher levels of perceived discrimination and acculturation stress. Means on perceived discrimination were higher for Spanish-dominant and bilingual youth than for English-dominant youth ($t = 2.14$, $df = 550$, $p = .03$, and $t = 2.04$, $df = 1,023$, $p = .04$); for recent arrivals compared to later arrivals ($t = 2.28$, $df = 452$, $p = .02$); and for recent arrivals compared to lifetime residents ($t = 3.84$, $df = 327$, $p < .01$). Means on acculturation stress were higher for Spanish-dominant youth compared to both bilingual youth ($t = 2.57$, $df = 461$, $p = .01$) and English-dominant youth ($t = 4.14$, $df = 501$, $p < .01$); for bilingual compared to English-dominant youth ($t = 2.29$, $df = 1,010$, $p = .02$); for recent arrivals compared both to later arrivals ($t = 2.97$, $df = 460$, $p < .01$) and lifetime residents ($t = 8.18$; $df = 295.34$, $p < .01$); and for later arrivals compared to lifetime residents ($t = 4.18$, $df = 292$, $p < .01$).

effects pointed to significantly less frequent alcohol use among girls than among boys, as well as less pro-drug substance use intentions, norms, expectancies, and peer approval of use for girls. Better academic performance (usual grades) was significantly associated with less frequent use of alcohol, cigarettes, and marijuana, as well as weaker substance use intentions. Linguistic acculturation, with English-dominant youth as the reference group, was a significant predictor of actual substance use, but Spanish-dominant youth were significantly less likely to espouse pro-drug personal norms, expectancies, and peer approval of use. Lengthier U.S. residence predicted more frequent cigarette use but weaker intentions to use substances. Foreign-born respondents were significantly different from the U.S.-born only in reporting weaker substance use intentions.

Findings paralleling those in Table 2 were found when we investigated additional substance use measures (results not presented), such as recent substance use amounts rather than frequency, lifetime rather than recent substance use, and other measures of substance use attitudes (parental disapproval of substance use). Perceived discrimination, but not acculturation stress, predicted pro-drug use behaviors or attitudes on these other outcomes. Sensitivity analyses, estimating alternate models (logistic regression, zero inflated negative binomial models) that adjusted for skewed distributions in the substance use behavior outcomes, also confirmed the findings in Table 2.²

The fourth and final set of models tested whether perceived discrimination and acculturation stress were moderated by the linguistic acculturation dummy variables or time in the United States. Only scattered interaction effects were found (not reported in tables). Some showed that the less acculturated students were less vulnerable to the effects of these stressors. The effect of perceived discrimination in predicting higher levels of peer approval of substance use was weaker for Spanish-dominant students ($\beta = -.101, p < .01$) compared to English-dominant students. Spanish-dominant ($\beta = -.082, p < .05$) and bilingual students ($\beta = -.115, p < .01$) also reported weaker effects of acculturation stress on peer approval of substance use than English-dominant students reported. An additional interaction pointing in the same direction was that students living longer in the United States reported more severe effects of perceived discrimination on substance use intentions ($\beta = .060, p < .05$). Inconsistent with these results—showing more pronounced negative effects of the stressors for less acculturated students—was the finding that the effects of acculturation stress in predicting more frequent marijuana use was more pronounced among Spanish-dominant than among English-dominant students ($\beta = .130, p < .01$). These somewhat scattered findings contrasted, however, with the fact that there was no evidence that acculturation—language use or time in the United States—moderated the effects of perceived discrimination or acculturation stress for the remaining six outcomes.

²We first reran the OLS regression models with a logged version of the substance use measures to minimize effects of skewed distributions, and found results similar to those in Table 2. We then ran zero-inflated negative binomial models to adjust for overdispersion due to the large number of nonusers of substances. Mirroring the OLS results, perceived discrimination positively predicted the use of marijuana and inhalants and the severity of alcohol use frequency. After the zero-inflated model failed to converge in predicting cigarette use frequency, we estimated a negative binomial model that showed that perceived discrimination predicted more frequent use. One result not found through OLS was that acculturation stress predicted inhalant use (vs. nonuse), but also less severe inhalant use. We opted to report the original OLS results for four reasons: (1) the outcome variables are collapsed, not true counts, for which negative binomial models are designed; (2) we did not hypothesize that acculturation stress and perceived discrimination would differentially relate to use versus use severity; (3) the pattern of results from the alternative analyses substantially corroborated the original results; and (4) a similar pattern of results was obtained using OLS regression to predict substance use measures other than those in Table 2: amounts rather than frequency of substance use, and lifetime rather than recent substance use. For all these alternate measures, perceived discrimination, but not acculturation stress, predicted more substance use.

Discussion

This study examined the existence and effects of perceived ethnic discrimination and acculturation stress among a group of Latino preadolescents, mostly from immigrant families of Mexican origin living in a large urban center of the Southwest. Despite the children's young age, perceived discrimination and acculturation stress were prevalent—more than half reported having experienced these stressors—and the stressors were clearly related to these children's substance use behaviors and attitudes. The study demonstrated that these two stressors could be separated in measurement, and that in doing so, perceived discrimination emerged as a more potent factor than acculturation stress in predicting substance use outcomes.

The extent of perceived discrimination is of concern because it manifested a clear and consistent relationship with substance use outcomes among such a young group of preadolescents. It was associated with greater recent and lifetime use of the mostly commonly used substances and with key attitudinal antecedents of youth substance use: intentions to use substances, pro-drug norms, positive substance use expectancies, and peer approval of substance use. These are robust effects, given the sample's low rates of substance use due to the early age of participants. Although acculturation stress did not predict substance use, it did predict several substance use attitudes. This may signal a sleeper effect where the pro-drug norms and attitudes of youth experiencing acculturation stress may, with time, lead to actual substance use.

The finding of different effects of perceived ethnic discrimination and acculturation stress highlights the value of separately assessing the two constructs. The stronger effect of perceived discrimination suggests that negative societal reactions to one's ethnic minority status have a more deleterious impact than the acculturation process itself. However, acculturation stress may have underperformed as an independent variable in this analysis due to the way it was measured. It had fewer response options, and thus, less variance, and somewhat lower, although still acceptable, reliability than the perceived discrimination measure did. Another possible explanation for the weaker effects of acculturation stress is that the items in the scale focus on stress-inducing reactions of others toward the acculturating individual, rather than stress experienced as the individual attempts personal changes to accommodate the demands of a new culture. Although these stress-inducing reactions can come from family members and others from the culture of origin, another potent source is outsiders who engage in discrimination. Perceived discrimination by definition influences perceptions of the environment to which one is acculturating, thus some of the negative impact of acculturation stress on the individual may be mediated by the experience of ethnic discrimination. This possibility deserves additional research that more formally tests for these potential mediating effects.

Longitudinal data would also have shed light on seemingly contradictory findings. Perceived discrimination was inversely correlated with the two measures of acculturation—linguistic acculturation and time in the United States—but was positively associated with substance use frequency and pro-drug attitudes. Because of the body of research indicating that higher levels of acculturation are risk factors for substance use, this finding was unexpected. Although the complex set of possible temporal relationships could not be addressed with cross-sectional data, it is possible that substance use or pro-drug attitudes lead to the adoption of a worldview in which discrimination is more readily perceived. A follow-up study using longitudinal data would provide the necessary test of causal ordering among acculturation, acculturation stress, perceived discrimination, and substance use outcomes.

In addition to their direct main effects on substance use outcomes, the study also examined the distribution and effects of acculturation stress and perceived discrimination among more and less acculturated youth. Although acculturation stress was distributed in the sample as

expected, with more recent arrivals and less linguistically-acculturated youth experiencing the highest levels, perceived discrimination was not. Our expectation that English language-dominant youth and those living longer in the United States would perceive more discrimination was not met. Ethnic discrimination was perceived most intensely among the least acculturated youths—the recent arrivals and those who spoke less English. The same youths who experienced acculturation stress also experienced ethnic discrimination.

The finding that youth with less time in the United States perceived more discrimination than youth who had lived longer in the United States is inconsistent with research on Latino adults (Finch et al. 2000). The inconsistency may be due to the ages of the individuals in the studies. Recently arrived adults may be more optimistic than the children brought in tow, and this immigrant optimism (Portes and Rumbaut 2001) may reduce their likelihood of perceiving discrimination in their early years of U.S. residence. Immigrant children may not need familiarity with U.S. culture and its racial-ethnic hierarchy, assumed to accumulate with more time in the country, to interpret certain attitudes and behaviors as discriminatory. Recently arrived Latino youth can perceive ethnic discrimination without fully knowing that many people in the United States do not consider those of Mexican heritage to be white. Regardless of whether the United States racial-ethnic hierarchy is apparent upon arrival, relative newcomers who are unsure of their place in their new home country may have heightened sensitivity to messages conveying a rejection of their ethnic background. Perhaps the more acculturated youths with longer time in the United States come to view discriminatory attitudes and behaviors as a matter of course or a part of “the way things are.” Thus, they are less sensitive to some forms of discrimination and consequently report less discrimination. Some research among Asians has found that people respond differently over time to subtle versus blatant forms of discrimination (Yoo 2007).

The fact that bilingual and Spanish-dominant youth perceived similar levels of discrimination suggests that both groups operate in an environment experienced as harsh and unwelcoming. Rather than an asset, bilingualism may be devalued in favor of English monolingualism. Those who might otherwise feel well integrated and adapted through their ability to use two languages may find that others view Spanish language use as a sign of failure to assimilate and reason for mistreating them. This possibility is supported by prior research that has documented the existence of an intransigent nativism in the United States, which seeks to halt immigration and promote forceful assimilation, such as by requiring English only in public education and other public sectors (Portes and Rumbaut 2001). The risk in environments dominated by these ideologies is that youth will pursue adaptation strategies that they feel may shield them from perceived discrimination (e.g., by speaking English only and abandoning Spanish) but subject them to other risks as a function of shedding important protections that come from maintaining elements of the culture of origin (Marsiglia and Waller 2002).

These complex interpretations highlight the importance of context in determining adaptation processes among immigrants and acculturating individuals. As Berry (1994) has argued, acculturating individuals are influenced by the social context in which they live, not just by their personal characteristics. This context is elaborated in segmented assimilation theory (Portes and Zhou 1993) and its applications to youth substance use (Nagasawa, Qian, and Wong 2001). The theory describes multiple immigrant adaptation trajectories across generations and over time, and models a values change process in the context of oppression, variable access to educational and economic opportunities, and differential exposure to supportive ethnic communities. Segmented assimilation theory addresses the context in which stressors develop (e.g., how various acculturation pathways expose youth to acculturation stress and discrimination). The results from this study apply almost exclusively to youth from low-income families, without adequate variations in SES to explore the different trajectories of immigrant adaptation that segmented assimilation outlines. Although it is possible that the relationships

that emerged between discrimination and youth substance use outcomes are particularly acute for children from lower-income families, by controlling for a robust proxy for family socioeconomic status in our models, it is unlikely that discrimination effects are merely reflections of socioeconomic disadvantages.

Results from this study are limited to static models with independent variables that gauge individual-level adaptation rather than the contextual variables that are central to segmented assimilation theory, such as those pertaining to the political environment, the state of the local economy, the presence of ethnic communities, and school social contexts. These contexts might be important for explaining Spanish-dominant and bilingual youths' shared experience of discrimination. The legislature in the state where the study took place adopted an "English only" law which strictly limits and largely forbids the use of any language other than English in public school instruction. Enforcement of these policies that suppress the use of Spanish in classrooms may contribute to the sense of discrimination felt by less acculturated and more recently arrived Latino students.

Longitudinal research has shown that cumulative life stress and acculturation account for nativity differences in drug dependence (Turner, Lloyd, and Taylor 2006). U.S.-born Latino adults report more drug dependence than immigrant Latinos because they are more acculturated and experience more life stress. However, we found sparse evidence that less acculturated youth were less vulnerable to the deleterious effects of perceived discrimination and acculturation stress. The few significant moderator effects showing less impact of these stressors for less acculturated youth applied only when predicting certain substance use attitudes rather than actual substance use. Generally, then, less linguistic acculturation and less time in the United States did not offset the harmful effects of perceived discrimination and acculturation stress, suggesting that these stressors are powerful enough to override any protective direct effects of low levels of acculturation and biculturalism on substance use. It runs counter to findings from other research that has found that lesser or slower acculturation can protect against the effects of some risk factors on substance use and problem behaviors (Nieri et al. 2005; Ebin et al. 2001). Acculturation stress and perceived discrimination may be different from other stressors in that they are linked to a child's cultural orientation; they exist potentially *because* a child is Spanish-dominant or bilingual. Therefore, a child may choose a coping response that is inconsistent with the cultural identity, thinking it will protect him or her from the stressor.

An alternative explanation for why acculturation did not consistently moderate the effects of these two stressors is that our measure of acculturation did not capture potentially protective mechanisms of lesser acculturation. Cultural attitudes and norms, which were not measured in this study, rather than language use or time in the United States may be the avenue through which substance use as a coping strategy is avoided. Many Latino communities are characterized by a strong family orientation called *familismo* (Chun and Akutsu 2003). Youths with these attitudes who experience stress or discrimination may avoid substance use as a coping strategy because they fear it could have negative ramifications for the family. Similarly, fatalism—the belief that a person's behavior and future are beyond his or her control—is found more commonly among less acculturated persons (Cuellar, Arnold, and Maldonado 1995). Thus, fatalist Latino youths experiencing stress or discrimination may be more inclined to employ a passive coping strategy—one, unlike substance use, that requires no action on their part. Thus, it is possible that, had a measure of acculturation attitudes been available for this analysis, it may have moderated the impact of perceived discrimination and acculturation stress in the anticipated way. The possibility that attitudinal or other alternative measures of acculturation may moderate effects on substance use outcomes should be explored in future research before drawing definitive conclusions about acculturation as a moderator of acculturation stress or perceived discrimination.

In addition to the absence of cultural variables, the models tested did not include stress buffering mechanisms (Turner 1999) that may have suppressed some effects. It has been hypothesized that social support from family, which may be higher in Latino families due to *familismo*, contributes to better mental health among recent immigrants (Escobar 1998). The absence of such measures in this study is a limitation. Another limitation was that we were unable to explore national subgroups. There is variation in the context of reception among Latino immigrant subgroups, and these variations have implications for immigrant adaptation (Portes and Rumbaut 2001; Menjivar 2000). However, Mexicans, who comprise the overwhelming majority in this sample, have historically been met with hostility (Portes and Rumbaut 2001), making them an ideal group for assessing perceived discrimination and acculturation stress.

Despite these limitations, this study contributed to the research literature on youth substance use by addressing overlap in previously employed measures of perceived discrimination and acculturation stress, by assessing possible moderating effects of acculturation, and by examining these stressors in a previously unexplored sample of 5th grade students. These are children on the cusp of adolescence, when the risk of substance use initiation is greatest (Botvin and Griffin 2003), as is their vulnerability to drug-related attitudes that may later shape their substance use behavior (Elek et al. 2006). Building on this study's results and prior research with older samples (e.g., Vega and Gil 1998), future research should explore longitudinally how perceived discrimination and acculturation stress relate to substance use among preadolescents. This approach would provide a stronger empirical basis for causal conclusions, and it would illuminate whether the effects of acculturation stress on pro-drug norms and attitudes subsequently translate to actual use. Future research could also explore the influence of contextual factors, such as the level of tolerance for ethnic diversity in the schools and communities in which the youth reside, and the racial-ethnic socialization of youth by their parents. Interpretations of the present findings point to factors beyond the individual as potentially relevant to a fuller understanding of how perceived discrimination and acculturation stress may influence youth substance use.

References

- Andrews, Judy A.; Tildesley, Elizabeth; Hops, Hyman; Duncan, Susan C.; Severson, Herbert H. Elementary School Age Children's Future Intentions and Use of Substances. *Journal of Clinical Child and Adolescent Psychology* 2003;32:556–67. [PubMed: 14710464]
- Berry, John W. Acculturative Stress. In: Lonner, W.; Maplass, R., editors. *Psychology and Culture*. Boston, MA: Allyn and Bacon; 1994. p. 211-15.
- Berry, John W. Immigration, Acculturation, and Adaptation. *Applied Psychology: An International Review* 1997;46:5–34.
- Birman, Dina. Measurement of the Acculturation Gap in Immigrant Families and Implications for Parent-Child Relationships. In: Bornstein, Marc H.; Cote, Linda, editors. *Acculturation and Parent Child Relationships: Measurement and Development*. London: Lawrence Erlbaum Associates; 2006. p. 113-34.
- Botvin, Gilbert J.; Griffin, Kenneth W. Drug Abuse Prevention Curricula in Schools. In: Sloboda, Z.; Bukoski, WJ., editors. *Handbook of Drug Abuse Prevention: Theory, Science, and Practice*. New York: Kluwer Academic/Plenum Publishers; 2003. p. 45-74.
- Byrnes, James P. Changing Views on the Nature and Prevention of Adolescent Risk Taking. In: Romer, Daniel, editor. *Reducing Adolescent Risk: Toward an Integrated Approach*. Thousand Oaks, CA: Sage Publications; 2003. p. 11-17.
- CASA (The National Center on Addiction and Substance Abuse at Columbia University). *Cigarettes, Alcohol, and Marijuana: Gateways to Illicit Drug Use*. New York: National Center on Addiction and Substance Abuse at Columbia University; 1994.
- CASA (The National Center on Addiction and Substance Abuse at Columbia University). *Teen Tiplers: America's Underage Drinking Epidemic*. New York: National Center on Addiction and Substance Abuse at Columbia University; 2003.

- Chun, Kevin M.; Akutsu, Phillip D. Acculturation among Ethnic Minority Families. In: Chun, KM.; Organista, P Balls; Marin, G., editors. *Acculturation: Advances in Theory, Measurement, and Applied Research*. Washington, DC: American Psychological Association; 2003. p. 95-119.
- Cuellar, Israel; Arnold, B.; Maldonado, R. Cognitive Referents of Acculturation: Assessment of Cultural Constructs in Mexican Americans. *Journal of Community Psychology* 1995;23:339-56.
- Dalton, Madeline A.; Sargent, James D.; Beach, Michael L.; Titus-Ernstoff, Linda; Gibson, Jennifer J.; Bridget Aherns, M.; Tickle, Jennifer J.; Heatherton, Todd F. Effect of Viewing Smoking in Movies on Adolescent Smoking Initiation: A Cohort Study. *Lancet* 2003;362(9380):281-85. [PubMed: 12892958]
- de la Rosa, Mario. Acculturation and Latino Adolescents' Substance Use: A Research Agenda for the Future. *Substance Use and Misuse* 2002;37:429-56. [PubMed: 12064428]
- Delgado, Melvin. Hispanic Natural Support Systems and Alcohol and Other Drug Services: Challenges and Rewards for Practice. *Alcohol Treatment Quarterly* 1995;12:17-31.
- Donovan, John E. Really Underage Drinkers: The Epidemiology of Children's Alcohol Use in the United States. *Prevention Science* 2007;8:192-205. [PubMed: 17629790]
- Ebin, Vicki; Sneed, Carl D.; Morisky, Donald E.; Rotheram-Borus, Mary Jane; Magnussen, Ann M.; Malotte, C Kevin. Acculturation and Interrelationships between Problem and Health-Promoting Behaviors among Latino Adolescents. *Journal of Adolescent Health* 2001;28:62-72. [PubMed: 11137908]
- Elvira, Elek; Miller-Day, Michelle; Hecht, Michael L. Influences of Personal, Injunctive and Descriptive Norms on Early Adolescent Substance Use. *Journal of Drug Issues* 2006;36:147-71.
- Epstein, Jennifer A.; Botvin, Gilbert J.; Diaz, Tracy. Linguistic Acculturation Associated with Higher Marijuana and Polydrug Use among Hispanic Adolescents. *Substance Use and Misuse* 2001;6:477-99. [PubMed: 11346278]
- Escobar, Javier I. Immigration and Mental Health: Why Are Immigrants Better Off? *Archives of General Psychiatry* 1998;55:781-82. [PubMed: 9736003]
- Farrel, Albert D.; Danish, Steven J. Peer Drug Associations and Emotional Restraint: Causes or Consequences of Adolescents' Drug Use? *Journal of Consulting and Clinical Psychology* 1993;61:327-34. [PubMed: 8473586]
- Feagin, Joe R. The Continuing Significance of Race: Anti-Black Discrimination in Public Places. *American Sociological Review* 1991;56:101-16.
- Finch, Brian K.; Reanne, Frank; Vega, William A. Acculturation and Acculturation Stress: A Social-Epidemiological Approach to Mexican Migrant Farm Workers' Health. *International Migration Review* 2004;38:236-62.
- Finch, Brian K.; Hummer, Robert A.; Kolody, Bohdan; Vega, William A. The Role of Discrimination and Acculturative Stress in the Physical Health of Mexican-Origin Adults. *Hispanic Journal of Behavioral Sciences* 2001;23:399-429.
- Finch, Brian K.; Kolody, Bohdan; Vega, William A. Perceived Discrimination and Depression among Mexican-Origin Adults in California. *Journal of Health and Social Behavior* 2000;41:295-313. [PubMed: 11011506]
- Gil, Andres G.; Vega, William A.; Dimas, Juanita M. Acculturative Stress and Personal Adjustment among Hispanic Adolescent Boys. *Journal of Community Psychology* 1994;22:43-54.
- Hansen, William B.; Graham, John W. Prevention of Alcohol, Marijuana, and Cigarette Use among Adolescents: Peer Pressure Resistance Training Versus Establishing Conservative Norms. *Preventive Medicine* 1991;20:414-30. [PubMed: 1862062]
- Harrison, Lana D.; Kennedy, Nancy J. Drug Use in the United States Mexico Border Area: Is There an Epidemic Waiting to Happen? *Hispanic Journal of Behavioral Sciences* 1994;16:281-95.
- Hecht, Michael L.; Marsiglia, Flavio F.; Elek, Elvira; Wagstaff, David A.; Kulis, Stephen; Dustman, Patricia; Miller-Day, Michelle. Culturally Grounded Substance Use Prevention: An Evaluation of the Keepin' it REAL Curriculum. *Prevention Science* 2003;4:233-48. [PubMed: 14598996]
- Johnston, Lloyd D.; O'Malley, Patrick M.; Bachman, Jerald G. *Monitoring the Future National Survey Results on Drug Use, 1975-2006 Vol 1, Secondary School Students*. Bethesda, MD: National Institute on Drug Abuse; 2007. (NIH Publication No 07-6205)

- Kandel, Denise B.; Ping, Wu. The Contribution of Mothers and Fathers to the Inter-Generational Transmission of Cigarette Smoking in Adolescence. *Journal of Research on Adolescence* 1995;5:225–52.
- Pan Suk, Kim; Lewis, Gregory B. Asian Americans in the Public Service: Success, Diversity and Discrimination. *Public Administration Review* 1994;54:285–90.
- Kulis, Stephen; Marsiglia, Flavio F.; Hurdle, Donna. Gender Identity, Ethnicity, Acculturation, and Drug Use. *Journal of Community Psychology* 2003;31:1–22.
- Lau, Anna S.; Takeuchi, David T.; Alegria, Margarita. Parent-to-Child Aggression among Asian American Parents: Culture, Context, and Vulnerability. *Journal of Marriage and Family* 2006;68:1261–75.
- Lazarus, Richard S.; Folkman, Susan. *Stress, Appraisal, and Coping*. New York: Springer; 1984.
- Karmela, Liebkind; Jasinskaja-Lahti, Inga; Solheim, Erling. Cultural Identity, Perceived Discrimination, and Parental Support as Determinants of Immigrants' School Adjustments: Vietnamese Youth in Finland. *Journal of Adolescent Research* 2004;19:635–56.
- Marsiglia, Flavio F.; Kulis, Stephen; Hecht, Michael L.; Sills, Stephen. Ethnicity and Ethnic Identity as Predictors of Drug Norms and Drug Use among Pre-Adolescents in the Southwest. *Substance Use and Misuse* 2004;39:1061–94. [PubMed: 15387204]
- Marsiglia, Flavio F.; Kulis, Stephen; Wagstaff, David A.; Elek, Elvira; Dran, David. Acculturation Status and Substance Use Prevention with Mexican and Mexican American Youth. *Journal of Social Work Practice in the Addictions* 2005;5:85–111.
- Marsiglia, Flavio F.; Waller, Margaret. Language Preference and Drug Use among Southwestern Mexican American Middle School Students. *Children and Schools* 2002;25:145–58.
- Martin, Jack K.; Tuch, Steven A.; Roman, Paul M. Problem Drinking Patterns among African Americans: The Impacts of Reports of Discrimination, Perceptions of Prejudice, and 'Risky' Coping Strategies. *Journal of Health and Social Behavior* 2003;44:408–25. [PubMed: 14582316]
- Mena, Francisco J.; Padilla, Amado M.; Maldonado, Margarita. Acculturative Stress and Specific Coping Strategies among Immigrant and Later Generation College Students. *Hispanic Journal of Behavioral Sciences* 1987;9:207–25.
- Menjívar, Cecilia. *Fragmented Ties: Salvadoran Immigrant Networks in America*. Berkeley: University of California Press; 2000.
- Mossakowski, Krysia N. Coping with Perceived Discrimination: Does Ethnic Identity Protect Mental Health? *Journal of Health and Social Behavior* 2003;44:318–31. [PubMed: 14582311]
- Nagasawa, Richard; Qian, Zhenchao; Wong, Paul. Theory of Segmented Assimilation and the Adoption of Marijuana Use and Delinquent Behavior by Asian Pacific Youth. *The Sociological Quarterly* 2001;42:351–72.
- National Institute on Drug Abuse. *Drug Use among Racial/Ethnic Minorities*. Rev. Bethesda, MD: U.S. Department of Health and Human Services; 2003.
- Nieri, Tanya; Kulis, Stephen; Keith, Verna M.; Hurdle, Donna. Body Image, Acculturation and Substance Abuse among Boys and Girls in the Southwest. *American Journal of Orthopsychiatry* 2005;75:585–98. [PubMed: 16262516]
- Page, J Bryan. The Concept of Culture: A Core Issue in Health Disparities. *Journal of Urban Health* 2005;82(2):iii35–iii43. [PubMed: 15933329]
- Pavalko, Eliza K.; Mossakowski, Krysia N.; Hamilton, Vanessa J. Does Perceived Discrimination Affect Health? Longitudinal Relationships between Work Discrimination and Women's Physical and Emotional Health. *Journal of Health and Social Behavior* 2003;43:18–33. [PubMed: 12751308]
- Portes, Alejandro; Rumbaut, Ruben. *Legacies: The Story of the Immigrant Second Generation*. Berkeley: University of California Press; 2001.
- Portes, Alejandro; Min, Zhou. The New Second Generation: Segmented Assimilation and its Variants. *The Annals of the American Academy of Political and Social Sciences* 1993;530:74–96.
- Rogler, Lloyd H.; Cortes, Drama E.; Malgady, Robert G. Acculturation and Mental Health Status among Hispanics: Convergence and New Directions for Research. *American Psychologist* 1991;46:585–97. [PubMed: 1952420]
- Romero, Andrea J.; Roberts, Robert E. Stress within a Bicultural Context for Adolescents of Mexican Descent. *Cultural Diversity and Ethnic Minority Psychology* 2003;9:171–84. [PubMed: 12760328]

- Sellers, Robert M.; Caldwell, Cleopatra H.; Schmeelk-Cone, Karen H.; Zimmerman, Marc A. Racial Identity, Racial Discrimination, Perceived Stress, and Psychological Distress among African American Youth Adults. *Journal of Health and Social Behavior* 2003;43:302–17. [PubMed: 14582310]
- Swaim, Randall C.; Oetting, ER.; Edwards, Ruth W.; Beauvais, Fred. Links from Emotional Distress to Adolescent Drug Use: A Path Model. *Journal of Consulting and Clinical Psychology* 1989;57:227–31. [PubMed: 2708609]
- Telles, Edward E.; Edward, Murgia. Phenotypic Discrimination and Income Differences among Mexican Americans. *Social Science Quarterly* 1990;71:682–97.
- Turner, R Jay. Social Support and Coping. In: Horwitz, AV.; Scheid, TL., editors. *A Handbook for the Study of Mental Health: Social Contexts, Theories, and Systems*. Cambridge, England: Cambridge University Press; 1999. p. 198-210.
- Turner, R Jay; Avison, William R. Status Variations in Stress Exposure: Implications for the Interpretation of Research on Race, Socioeconomic Status, and Gender. *Journal of Health and Social Behavior* 2003;44:488–505. [PubMed: 15038145]
- Turner, R Jay; Lloyd, Donald A.; Taylor, John. Stress Burden, Drug Dependence and the Nativity Paradox among U.S. Hispanics. *Drug and Alcohol Dependence* 2006;83:79–89. [PubMed: 16330158]
- Vega, William A.; Gil, Andres G. *Drug Use and Ethnicity in Early Adolescence*. New York: Plenum Press; 1998.
- Vega, William A.; Gil, Andres G.; Kolody, Bohdan. Pathways to Drug Use. In: Vega, WA.; Gil, AG., editors. *Drug Use and Ethnicity in Early Adolescence*. New York: Plenum Press; 1998a. p. 71-93.
- Vega, William A.; Gil, Andres G.; Wagner, Eric. Cultural Adjustment and Hispanic Adolescent Drug Use. In: Vega, WA.; Gil, AG., editors. *Drug Use and Ethnicity in Early Adolescence*. New York: Plenum Press; 1998b. p. 125-48.
- Vinokurov, Andrey; Trickett, Edison J.; Birman, Dina. Acculturative Hassles and Immigrant Adolescents: A Life-Domain Assessment for Soviet-Jewish Refugees. *Journal of Social Psychology* 2002;142:425–45. [PubMed: 12153121]
- Warner, Lynn A.; Valdez, Avelardo; Vega, William A.; de la Rosa, Mario; Turner, R Jay; Canino, Gloria. Hispanic Drug Abuse in an Evolving Cultural Context: An Agenda for Research. *Drug and Alcohol Dependence* 2006;84S:S8–S16. [PubMed: 16750335]
- Whitbeck, Les B.; Hoyt, Dan R.; McMorris, Barbara J.; Chen, Xiaojin; Stubben, Jerry D. Perceived Discrimination and Early Substance Abuse among American Indian Children. *Journal of Health and Social Behavior* 2001;42:405–24. [PubMed: 11831140]
- Wills, Thomas A.; Filer, Marnie. Stress-Coping Model of Adolescent Substance Use. In: Ollendick, TH.; Prinz, RJ., editors. *Advances in Clinical Child Psychology*. Vol. 18. New York: Plenum Press; 1996. p. 91-132.
- Wright, Douglas; Pemberton, Michael. *Risk and Protective Factors for Adolescent Drug Use: Findings from the 1999 National Household Survey on Drug Abuse*. Rockville, MD: Department of Health and Human Services, Substance Abuse and Mental Health Services Administration, Office of Applied Studies; 2004.
- Yoo, Hyung Chol. Experience and Coping Process of Perceived Racism among Asian Americans. Presented at the Southwest Interdisciplinary Research Center Brown Bag Series; April 24; Phoenix, AZ. 2007.
- Zayas, Luis H.; Rojas, Mary; Malgady, Robert G. Alcohol and Drug Use among Hispanic Men in Early Adulthood. *American Journal of Community Psychology* 1998;26(3):425–38. [PubMed: 9726116]

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TABLE 1
Descriptive Statistics and Pearson Correlations with Main Independent Variables

	N	Mean	SD	Correlation with Perceived Discrimination	Correlation with Acculturation Stress
Recent Substance Use Frequency					
Alcohol	1,360	1.184	.648	.140**	.046
Cigarettes	1,367	1.079	.526	.154**	.065*
Marijuana	1,371	1.071	.522	.165**	.038
Inhalants	1,366	1.110	.556	.119**	.046
Substance Use Attitudes					
Use Intentions	1,368	1.235	.4964	.283**	.187**
Personal Norms	1,367	1.213	.499	.213**	.136**
Positive Drug Expectancies	1,363	1.411	.652	.309**	.119**
Peer Approval of Drug Use	1,336	1.988	1.426	.111**	-.004
Main Independent Variables					
Perceived Discrimination	1,374	1.601	.700	1.000	.237**
Acculturation Stress	1,374	1.179	.281	.237***	1.000
Controls					
Linguistic Acculturation (scale)	1,348	3.365	.948	-.078**	-.137**
Spanish Language-Dominant	1,348	.204	.403	.035	.103***
Bilingual	1,348	.445	.497	.031	.008
English Language-Dominant	1,348	.351	.477	-.062*	-.095***
Time in U.S.	1,338	4.020	1.285	-.125**	-.255**
Age	1,366	10.360	.589	-.014	.001
Female (1) vs. Male (0)	1,374	.512	.500	-.070**	-.076**
Lunch Program Participation	1,343	1.310	.590	.001	-.043
Usual Grades in School	1,338	6.932	1.815	-.145**	-.138**
Foreign-born (1) vs. U.S.-born (0)	1,354	.272	.445	.086**	.213**

p < .05;

 $p < .01$;

(two-tailed tests)

TABLE 2
Standardized Multiple Regression Coefficients (Standard Errors), Predicting Substance Use Behaviors and Attitudes

	Alcohol	Cigarettes	Marijuana	Inhalants	Substance Use Intentions	Personal Norms	Positive Drug Expectancies	Peer Approval of Drug Use
Age	-.002 (.031)	-.012 (.025)	.014 (.025)	-.011 (.027)	.042 (.023)	.050 ⁺ (.023)	.009 (.030)	-.052 (.070)
Lunch program	-.009 (.031)	-.015 (.026)	-.027 (.025)	-.046 (.028)	-.009 (.023)	.008 (.024)	-.017 (.030)	.004 (.070)
Female	-.079** (.037)	-.049 ⁺ (.030)	-.032 (.030)	-.008 (.033)	-.058* (.027)	-.072* (.028)	-.055* (.035)	-.112*** (.083)
Usual grades	-.097** (.010)	-.068* (.009)	-.094** (.008)	-.014 (.009)	-.096** (.008)	-.042 (.008)	-.033 (.010)	.009 (.024)
Spanish dominant	-.010 (.055)	-.020 (.046)	-.044 (.045)	-.024 (.049)	-.057 ⁺ (.041)	-.072* (.042)	-.087** (.053)	-.099** (.125)
Bilingual	.040 (.042)	.013 (.034)	-.017 (.034)	.011 (.037)	-.059 ⁺ (.031)	-.041 (.032)	-.046 (.040)	-.033 (.094)
Time in U.S.	.068 ⁺ (.021)	.081* (.017)	.033 (.017)	.010 (.018)	-.084* (.015)	-.057 (.016)	-.046 (.0120)	.049 (.046)
Foreign born	-.032 (.059)	.046 (.049)	.003 (.048)	-.012 (.053)	-.087* (.044)	-.025 (.045)	-.070 ⁺ (.057)	-.001 (.133)
Perceived discrimination	.141*** (.027)	.141*** (.022)	.158*** (.022)	.125*** (.024)	.251*** (.020)	.183*** (.020)	.300*** (.026)	.121*** (.061)
Acculturation stress	.019 (.069)	.027 (.056)	-.014 (.055)	.021 (.061)	.108*** (.050)	.093** (.052)	.058* (.066)	-.023 (.156)
Constant	1.099*** (.212)	.931*** (.174)	1.059*** (.170)	1.022*** (.188)	.989*** (.155)	.864*** (.161)	1.078*** (.204)	2.292*** (.485)
N	1,238	1,246	1,248	1,243	1,246	1,247	1,242	1,219
Adjusted R ²	.043	.029	.034	.013	.118	.066	.111	.035

⁺
 $p < .10$;

$p < .001$ (two-tailed tests)

 $p < .01$;
**
 $p < .05$;
*