

Behavioural Risk Factors and Protective Factors in Adolescents: A Comparison of Latinos and Non-Latino Whites

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ABSTRACT

Objectives. *This study investigated differences in behavioural health protective and risk factors in US Latino and non-Latino White adolescents as well as differences among Latinos with different levels of acculturation using a bicultural acculturation model. The bicultural model is consistent with current understanding of cultural change processes; however it has infrequently been applied to understand adolescent health outcomes. The outcomes included risk and health behaviours as well as mental health factors consistent with Jessor's framework for describing adolescents' health status.*

Design. *Participants included 1119 students randomly selected from all middle schools of a Northern California district. Respondents completed project staff administered self-reports surveys in their schools that included assessments of health behaviours, mental health, and socio-cultural variables—including acculturation level.*

Results. *Latinos were at higher risk than non-Latino Whites in the following areas: academic orientation, physical activity, and sunscreen use. Boys and those of lower social class were more likely to report use of various substances and violence. Among Latinos, those in the marginalised acculturation group—those with less attachments and adaptations to Latino and other cultures, showed less desirable mental health outcomes than the bicultural group.*

Conclusion. *These results extend prior research by assessing the health needs of early adolescent youth. The study found important differences within Latinos using a bicultural acculturation model. The use of a bicultural acculturation model, or cultural orientation approach more generally, may have especial utility for addressing health issues wherever minority populations interact with a dominant society.*

Keywords: Latinos, health behaviours, risk behaviours, adolescents

A major public health objective in the USA is to eliminate health disparities in ethnic populations;¹ for youth, key health status indicators reflect lifestyle behaviours.² Local³ and national studies^{4, 5} show differences in risk behaviours for Latino and

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(non-Latino) White adolescents. Latino 8th graders report higher levels of cigarette use in their lifetimes, alcohol use and illicit drug use;⁵ however, Whites report higher current cigarette use.^{4, 5} Additionally, differences in other delinquency-related outcomes and healthy behaviours have been found.⁴ Despite these differences, national data consistently suggest these two groups report the highest levels of substance use among the four largest US ethnic groups,^{4, 5} highlighting the critical importance of clarifying their health needs.

Within Latino adolescents, there are differences in health outcomes. Some studies suggest more acculturated Latinos exhibit more risk behaviours,⁶⁻⁹ while others suggest less acculturation is associated with higher risk.^{10, 11} Much of the inconsistency in the acculturation and health behaviour literature has been the result of attempts to combine Latinos from different regions as well as the use of more limited models of cultural change in such studies.¹¹⁻¹³ Much of the previous studies have used generational status (e.g. based on whether they or their family members were born in another country) and/or unidimensional acculturation measures where a single language preference item (e.g. do you speak Spanish or English in your home) is employed. Rather, to more fully describe acculturation research should consider multiple facets such as natal, behavioural and subjective elements of culture and allow for independent orientation to the original and new cultures to be assessed.¹³ Allowing for independent orientation to each culture of interest (orthogonal measurement) is critical because persons do not move linearly while they learn and adapt to a new culture.^{12, 13} In fact some persons may remain more oriented to their original culture than their new culture of influence after many years of being immersed with both cultures, while other persons may more oriented to their new culture than their previous culture, while still others may be oriented and adapted to both cultures (bicultural individuals), and finally, still others may become disengaged from and non-adapted to both cultures (marginalised).¹⁴ Most research on Latino health issues have not been able to distinguish the latter two groups, likely contributing to the inconsistency across studies.

Health interventions could be improved through the use of carefully planned assessments in ethnic communities.¹⁵ Focusing on Latino and non-Latino White US youth, the current study explores ethnic and cultural differences in outcomes consistent with Jessor's descriptions of adolescents' health indicators.¹⁶ Such outcomes include risk behaviours, health behaviours, as well as mental health indicators. Such research is needed because some of the substantial differences in the health status of minority populations are attributable to behavioural factors.^{17, 18} In this study we will also consider social class as a source for health differences, because often associations between ethnicity and health indicators can be in part explained by social class differences and discrimination.^{19, 20} Social class and ethnicity will be considered separate factors related to health however, because often neither fully explains the differences in health status attributed to the other. One strong example for this is for examining differences in youth smoking rates in the US—where low social class and self-identification as White are consistently associated with increase risk for smoking, while they are inversely associated with each other.^{4, 5, 21} These trends have also been replicated not only with self-reports of smoking but also with biochemical indices of smoking.²² In sum, the relationships between ethnicity and smoking are stronger in the general adolescent population level when the relationships of social class are also simultaneously considered, suggesting the importance for considering the potential for independent explanatory power of each.

The current research also extends the health literature by employing a more complex model of acculturation, or cultural orientation more generally (they are often used interchangeably, but acculturation traditionally has implied linguistic changes in addition to cultural changes), than typically employed. One likely reason for the inconsistencies in research on acculturation and health has been the reliance on a unidimensional model,

where persons are considered acculturated or not—thus precluding the identification of bicultural and marginalised individuals. This study rather will extend our understanding of health differences in Latino adolescents by employing a bicultural cultural orientation model that recognises the potential that bicultural and marginalised Latinos are important groups.

METHODS

Participants and Procedures

Participants ($N = 1119$) represented the Latino and non-Latino White sub-samples of middle school students surveyed in a large urban Northern California school district in 1999. The original sample included students ($N = 1622$) from all seven middle schools of a district selected for its disproportionate numbers of Latinos and non-Latino Whites. An advantage of surveying in middle schools is that sampling tends to be more representative than in traditional high schools, since fewer students are in alternative or court schools or have dropped out. Further, to complement ongoing adolescent research,^{4,5} we aimed to survey students who are slightly younger than those usually surveyed. Thus we randomly sampled from all classes that included 6th and 7th grade students.

To ensure privacy, trained staff collected data using active parent and student consent procedures. We had a parent consent form return rate of 78% of whom 89% indicated positive consent. Surveys were collected from 65% of the targeted students, this total participation rate is higher than that reported for comparable federally supported surveys conducted in the same state (YRBS rate was 56% in California) and in the largest nearby participating city (56% in San Francisco).⁴

Measures

Participants completed a self-report questionnaire (English or Spanish) assessing health-related behaviours and mental health factors consistent with Jessor's model describing the key health status indicators for adolescents,¹⁵ demographics, and acculturation. Where available, outcomes were consistent with those in national surveys.^{4,5} Social class was determined by an algorithm using the average level of mother's education and father's education or, for cases in which parents' level of education was unknown by the respondent, parental education was estimated based on the level of perceived SES reported. Data from mid adolescents on their parent's education level is generally considered the marker of social class they can most reliably provide, however questions regarding perceived socioeconomic status have proven to be particularly useful for children and adolescents who may not know their parents' education or income.^{19,23} The social class variable ranged from 1 (both parents had not completed high school) to 4 (both parents had college degrees).

Acculturation Two orthogonal, or independent, seven-item measures of cultural orientation were used to measure acculturation. One scale assessed degree of Latino orientation and one scale assessed degree of Other Group orientation. These cultural orientation scales were primarily based on the Bidimensional Acculturation Scale.²⁴ Items from another orthogonal scale, the revised Acculturation Rating Scale for Mexican Americans,¹⁴ were also incorporated so that an additional important facet of acculturation, ethnic social interaction, could be assessed. While there are facets of cultural orientation we did not assess, such as cultural attitudes and perceptions of discrimination,²⁵ language use/exposure and ethnic social interaction were focal for this study because they can be reliably assessed with a minimal subset of items and they were promising in research on risk factors for substance use in Latino youth.^{11,18} The Latino

orientation ($\alpha = 0.83$) and Other Group orientation ($\alpha = 0.79$) scales were both adequately reliable. However, these scales were not correlated to each other ($r = -0.03$, $p > 0.05$), supporting the importance of independent assessment of cultural orientation for each potential social group of influence.

Latinos who completed both cultural orientation scales were placed into one of four acculturation groups using median splits in the those scales.¹⁴ The acculturation groups were: (1) Bicultural (median or above in both the Latino and Other Group orientation scales); (2) Latino-focused (median or above in the Latino orientation scale only); (3) Other-focused (median or above in Other Group orientation scale only); and (4) Marginalised¹⁸ (below the median in both cultural orientation scales). It should be noted that relative to the predominantly adult samples used to test the orthogonal scales we based our scale on, our students on average reported higher absolute estimates for Other Group orientation.^{14, 24} For this study we also assessed other markers of acculturation that have been more frequently used in related research, namely generational status (e.g. ranging from 1st generation where they were born outside of the US to 4th or higher generation where all their immediate relatives at least through grandparents were born in the US) and a single unidimensional language preference item (whether the student completed the survey in English or Spanish).

Health risk behaviours We measured 13 risk behaviours: (1) *any drinking in lifetime*; (2) *any drinking in past month*; (3) *heavy drinking* (having five or more drinks in a row in past month); (4) *riding with a drunk driver in lifetime*; (5) *any smoking in lifetime*; (6) *any smoking in past month*; (7) *regular smoking* (having smoked 100 or more times, or having smoked on 10 or more days in the past 30 days); (8) *marijuana use in lifetime*; (9) *other illicit drug use in lifetime*; (10) *weapon carrying in past month*; (11) *having been injured or threatened in the past 12 months*; (12) *having been in a physical fight in the past 12 months*; (13) *the presence of a multiple risk behaviours*, defined as at least three positive responses to questions measuring the following behaviours: smoking, alcohol use, drug use, or violence-related outcomes; and (14) *academic orientation*, with a positive response defined as receiving an “F” for a class in the last semester or not expecting to complete high school.

Health behaviours Three health behaviours were measured. *Healthy eating* reflected whether respondents consumed an average of five or more servings of fruits or vegetables per day the 7 days prior to the survey. This was specifically determined by estimating whether the summed number of times respondents ate among six various groups of fruits or vegetables (e.g. an item about green salad consumption, an item about fruit eating, etc.) was greater to or equaled 35 (five servings averaged per day over the last week). Response formats for each of the six types of healthy food choices ranged from less than one time per day to more than three times per day, these six healthy foods items were internally consistent ($\alpha = 0.86$). *Physical activity* was determined by whether respondents participated in heavy exercise on four or more days or lighter exercise on five or more days in the past week. *Sunscreen use* was determined by whether respondents used sunscreen with an SPF 15 or higher ‘most of the time’ or ‘always’ when outside for more than one hour on a sunny day.

Mental health indicators Recent evidence suggests that positive mental health factors may be distinct from negative mental health factors in the prediction of future disease-related outcomes;²⁶ therefore, we sought to examine important measures of both negative and positive mental health indicators. *Depressive symptomatology*, which is a marker for risk of major depression and suicide, was measured with an eight-item ($\alpha = 0.76$)

shortened version of the CES-D. Our measure included assessments of four major symptom domains of depression within the past 7 days (week): negative affect, (absence of) positive affect, somatic complaints, and interpersonal problems. Criteria for classifying depressive symptomatology followed the guidelines of Santor and Coyne for improving the sensitivity and specificity of the shortened CES-D²⁷—respondents exhibiting four or more symptoms in the previous week were considered high depressive symptomatology.

Our measure of positive mental health was *optimism*. Optimism has been linked to a host of healthy behaviours when defined as a general positive outlook for ones' future,^{26, 28} and was measured with eight-item positive global expectancy measure ($\alpha = 0.87$). This global expectancy measure was based on adult dispositional optimism and hope scales adapted for mid adolescents in previous studies; in fact this measure was found to be better predictor of adolescent substance use than related measures of self-esteem or self-mastery.²⁸ A median split was used to define those high and low on optimism.

Statistical analysis Significant differences in behavioural outcomes and mental health outcomes were tested using multiple logistic regression. Differences in the proportion of each outcome attributed to ethnic identification and acculturation status were conducted with social class, gender and age also included in all models. These demographic characteristics were selected for inclusion because they have been found in prior research to be related to some or all of the outcomes in the study.^{7, 19, 20, 29} Additionally, interactions between gender and ethnicity or acculturation were also tested because of potential for gender to moderate the relationships between our cultural variables and health outcomes (for instance to detect if drug use was particularly prevalent in White boys or marginalised Latinas).^{6, 7, 9} In no case was such an interaction term significant ($p > 0.05$), nor did any model with the interaction term significantly ($p > 0.05$) improve upon the overall model fit from a model without that interaction term. (The most robust evaluation of this, and the one used, was examining whether the difference of $-2LL$ estimates of the models are statistically significant—they are distributed like a χ^2 and the χ^2 difference test can be applied). Because of the uniformly null findings concerning the significance of gender interactions, all estimates presented were derived from the models without such interaction terms.

All odds ratios corresponding to ethnicity and acculturation groups are presented from the multivariable logistic regressions along with significant gender and social class differences. The referents for ethnicity and gender were non-Latino Whites and females; the initial referents for the acculturation groupings was the marginalised group because of evidence for their overall highest health risk.³⁰ However, when significant relationships between acculturation and the outcomes were apparent, additional models were run where all pairwise comparisons of acculturation groups were tested by varying the referent.

RESULTS

The overall study sample included 705 Latinos and 414 non-Latino Whites, and was relatively evenly split by gender (53% female). Median age was 12 ($M = 12.0$, $SD = 0.74$) and 51% of participants had a parent who completed some college. Ethnicity and social class were significantly associated ($r = -0.43$, $p < 0.01$), where Latinos mean score was 2.4 (i.e. the most typical response was where one parent had graduated from high school and one parent who had undertaken some college) where non-Latino Whites reported a mean score of 3.3 (i.e. the most typical response is where one parent had some college and the other had completed college).

Associations of Ethnicity and Demographics with Health Outcomes

Presented in Table 1 are unadjusted proportions of each outcome. Also presented are multivariable tests of statistical significance for Latinos or (non-Latino) Whites.

Drinking There were no significant ethnic differences in trying alcohol, having a drink in the past month, having five or more drinks in a row in the past month, or riding in a car with someone who had been drinking. There were no gender or social class differences in drinking behaviour.

Smoking and drug use There were no ethnic or gender differences in lifetime cigarette use, cigarette use in the past month, regular smoking, marijuana use or other drug use. However social class was associated with lower risk for lifetime smoking (OR = 0.83, CI = 0.70–0.99) and lower risk for other drug use (OR = 0.49, CI = 0.29–0.82). (The odds ratio for social class can essentially be interpreted as the degree each unit change increase in level of parents education, e.g. having a mother with less than high school completed relative to one with high school completed, modifies the risk for that particular health outcome.)

Violence More Latinos (9%) than Whites (5%) reported weapon carrying; however, this difference was not statistically significant when tested in the multivariable model. No ethnic differences were found in reports of fighting or being threatened or injured. Boys were more likely than girls to report weapon carrying (OR = 2.80; CI = 1.67, 4.95), fighting (OR = 2.91, CI = 2.03, 4.18), and being threatened/injured (OR = 1.93; CI = 1.15, 3.33). Social class was negative related to fighting (OR = 0.74, CI = 0.60–0.91).

Multiple risk behaviours There were no ethnic or social class differences in the reporting of three or more substance use and/or violence behaviours. Boys however were significantly more likely to report multiple risk behaviours (OR = 1.52, CI = 1.08, 2.15).

Academic orientation A higher percentage of Latinos (18%) than Whites (6%) reported low academic orientation. There were no gender or social class differences in academic orientation.

Health behaviours There were no significant ethnic or gender differences in healthy eating. More Latino boys (38%) reported eating five or more fruits and vegetables in the past week than the other groups (30%)—though the model with the gender by ethnicity interaction term did not significantly improve the prediction beyond the model without that term ($p > 0.05$). Also, more Whites (76%) than Latinos (59%) reported being physically active; there were no gender differences in activity. Finally, fewer Latinos (18%) than Whites (30%) reported regular sunscreen use; fewer boys also reported this behaviour (OR = 0.49, CI = 0.35, 0.70). There were no social class differences in health behaviours.

Mental health There were no ethnic or social class differences in reported optimism or depressive symptomatology. Boys however were significantly less likely to report depressive symptomatology (OR = 0.63, CI = 0.45, 0.89).

TABLE 1. Percentages of Behavioural Risk and Protective Factors among Latino and Non-Latino White Adolescents

	Boys				Girls				OR (95%CI)
	All	Latinos (n = 330)		Non-Latino Whites (n = 192)		Latinos (n = 375)	Non-Latino Whites (n = 222)		
<i>Risk Behaviours</i>									
Any drinking in lifetime	47	46	47	47	47	46	46	46	0.89(0.67,1.18)
Drinking in past month	14	14	16	16	14	13	13	13	0.84(0.56,1.25)
Heavy drinking in past month	3	3	4	4	4	2	2	2	1.05(0.48,2.29)
Riding with drunk driver	29	34	26	26	30	27	27	27	1.09(0.76,1.57)
Any smoking in lifetime	22	24	21	21	25	14	14	14	1.30(0.91,1.84)
Smoking in past month	9	9	9	9	10	7	7	7	1.02(0.61,1.69)
Regular smoking	4	5	4	4	5	2	2	2	1.16(0.54,2.48)
Marijuana use	8	8	9	9	8	6	6	6	0.93(0.54,1.59)
Other illicit drug use	2	3	2	2	2	1	1	1	1.06(0.34,3.24)
Weapon carrying in past month	9	12	9	9	6	2	2	2	1.67(0.89,3.14)
Injury/threat in past 12 months	5	11	13	13	7	6	6	6	0.93(0.52,1.65)
Fighting in past 12 months	25	39	31	31	17	15	15	15	1.01(0.68,1.51)
Academic Failure	12	19	8	8	18	5	5	5	2.93(1.80,4.75)
Multi-risk behaviour	14	17	17	17	13	11	11	11	0.93(0.63,1.38)
<i>Health Behaviours</i>									
Healthy eating	32	38	31	31	30	29	29	29	1.32(0.95,1.83)
Physical activity	66	62	75	75	57	76	76	76	0.52(0.37,0.73)
Sunscreen Use	23	13	23	23	23	37	37	37	0.58(0.40,0.84)
<i>Mental health outcomes</i>									
Optimism	62	66	63	63	59	65	65	65	1.02(0.76,1.38)
Depression	15	13	10	10	19	19	19	19	0.93(0.63,1.37)

Note: Odds ratios of Latinos reporting the behavioural risk factor compared with non-Latino Whites, adjusted for sex, age, and social class. Referents for ethnicity and gender were non-Latino Whites and females, respectively. If the odds ratio does not include 1.00 there are statistically significant differences in these groups ($p < .05$).

Latino-specific Findings

Mexican American (62%) was the largest specific Latino sub-group identified by the respondents. Thirteen per cent of all Latinos indicated they were first generation immigrants, 40% indicated they second generation, 26% indicated they were third generation, and 21% indicated they were fourth generation or higher. Of all Latinos, 8% completed Spanish surveys. *Relationships between acculturation and related variables* Categorisation in the acculturation groups was significantly associated with generational status ($\chi^2_{(12)} = 66.9, p < 0.001$) and selection of the Spanish version of the survey ($\chi^2_{(3)} = 19.5, p < 0.001$). Of the four groups, Latino-focused participants were most likely to be first or second generation and to complete the Spanish survey, and the Other-focused participants were most likely to be third or later generation and to complete the English survey. Thus our acculturation classification was significantly associated with these more widely used but conceptually limited measures of cultural orientation. Additionally, acculturation was significantly related to social class ($\eta = 0.32, p < 0.01$). Latino-focused youth reported the lowest social class level ($m = 2.07$; CI = 1.92–2.22), followed by the bicultural group ($m = 2.37$; CI = 2.22–2.52). Highest reported social class was indicated in the other-focused group ($m = 2.78$; CI = 2.65–2.92), followed by the marginalised group ($m = 2.56$; 2.40–2.73).

Associations of acculturation and demographics to health outcomes The proportions of Latino students who reported the selected behaviours, by acculturation group, are presented in Table 2. No differences in the health behaviours were observed, though there were significant differences regarding both mental health indicators. Relative to all other acculturation groups, adolescent Latinos in the marginalised group showed more depressive symptomatology. Further, compared to those in the bicultural group, students in the marginalised group were less likely to have an optimistic outlook.

The Latino boys were significantly more likely to report some risk behaviours than Latinas. Latino boys were more likely to carry a weapon (OR 2.30, CI = 1.18–4.49), fight (OR 3.22, CI = 1.99–5.21) and report multiple risk behaviours (OR 1.64, CI = 1.05–2.58). There were also gender differences in health behaviours, where Latino boys were less likely to use sunscreen (OR 0.47, CI = 0.28–0.77), but they were more likely to report healthy eating (OR 1.49, CI = 1.02–2.19). For all models within Latinos, social class was only related one health outcome, where those of higher social class were at decreased risk for other drug use (OR 0.51, CI = 0.26–0.99).

DISCUSSION

This study compared behavioural risk factors, protective health behaviours and mental health indicators in a Latino and non-Latino White early-mid adolescent sample that varied in social class. The findings suggest that Latinos, relative to non-Latino Whites, exhibited lower academic orientation (a key risk factor in many models of adolescent risk behaviour or delinquency), were less physically active, and used sunscreen less consistently. Latino boys were most likely to eat five or more fruits and vegetables per day than the other groups. Gender and social class differences were also found. Boys were more likely to engage in violence-related behaviours and exhibit a multi-risk behaviour pattern; while they were less likely to use sunscreen. Girls were at significantly higher risk for depressive symptomatology. Higher social class was related to less reported substance use and violence consistent with the adolescent health risk behaviour literature,¹⁹ though social class was unrelated to the other health indicators when ethnicity was simultaneously considered.

These findings on the ethnic differences in the prevalence of the behavioural risk and protective health behaviours are generally consistent with those found with the most

TABLE 2. Percentages of behavioural risk and protective factors among Latino adolescent boys and girls, by acculturation group

	Marginal (n = 114)		Latino-focused (n = 151)		Other-focused (n = 151)		Bicultural (n = 168)	
	(%)	OR (CI)	(%)	OR (CI)	(%)	OR (CI)	(%)	OR (CI)
<i>Risk Behaviours</i>								
Any drinking in lifetime	41	1.0	52	1.42(0.84,2.41)	47	1.34(0.80,2.24)	51	1.49(0.89,2.49)
Drinking in past month	13	1.0	19	1.63(0.78,3.41)	10	0.71(0.32,1.59)	15	1.24(0.60,2.58)
Heavy drinking in past month	4	1.0	4	1.39(0.33,5.78)	3	0.81(0.17,3.90)	5	1.73(0.45,6.62)
Riding with drunk driver	35	1.0	35	1.14(0.59,2.21)	25	0.71(0.37,1.36)	33	1.00(0.54,1.85)
Any smoking in lifetime	18	1.0	28	1.63(0.86,3.10)	22	1.45(0.76,2.78)	25	1.44(0.76,2.70)
Smoking in past month	9	1.0	11	1.28(0.50,3.33)	11	1.64(0.65,4.14)	7	0.80(0.30,2.14)
Regular smoking	4	1.0	5	1.77(0.45,6.95)	5	1.86(0.46,7.50)	5	1.72(0.45,6.58)
Marijuana use	6	1.0	10	1.06(0.26,4.38)	10	2.06(0.53,8.07)	8	1.65(0.41,6.72)
Other illicit drug use	3	1.0	3	1.29(0.22,7.50)	3	1.60(0.27,9.40)	2	1.25(0.22,7.04)
Weapon carrying in past month	9	1.0	8	0.86(0.32,2.34)	8	0.82(0.30,2.21)	10	1.30(0.53,3.20)
Injury/threat in past 12 months	12	1.0	10	0.92(0.33,2.57)	6	0.46(0.15,1.41)	10	0.93(0.36,2.40)
Fighting in past 12 months	41	1.0	29	0.69(0.34,1.41)	25	0.58(0.29,1.14)	22	0.46(0.24,0.90)
Academic failure	21	1.0	15	0.72(0.37,1.42)	17	0.75(0.39,1.45)	18	0.82(0.43,1.55)
Multi-risk behaviour	18	1.0	21	1.27(0.66,2.45)	13	0.75(0.38,1.51)	17	0.95(0.49,1.82)
<i>Health behaviours</i>								
Healthy eating	38	1.0	37	1.05(0.59,1.86)	31	0.72(0.41,1.28)	30	0.72(0.41,1.27)
Physical activity	57	1.0	60	1.12(0.65,1.95)	60	1.02(0.59,1.75)	60	1.16(0.68,1.99)
Sunscreen use	16	1.0	15	0.87(0.39,1.92)	25	1.69(0.82,3.45)	16	1.08(0.52,2.26)
<i>Mental health outcomes</i>								
Optimism	58	1.0	58	0.97(0.57,1.66)	59	0.93(0.55,1.57)	71	1.86(1.09,3.18)
Depression	28	1.0	15	0.47(0.25,0.89)	13	0.39(0.20,0.75)	17	0.52(0.29,0.96)

Note: Median splits were used to determine the four acculturation groups. All odds ratios are relative to marginalised persons (referent), adjusted for sex, age, and social. Referents for gender and acculturation grouping were females, and bicultural persons, respectively. If the odds ratio does not include 1.00 there are statistically significant differences in the relevant groups ($p < 0.05$).

comparable national surveys. As in the most recent Monitoring the Future study—a US national survey targeting youth funded by the National Institute of Drug Abuse, Latinos and non-Latino whites were not different in their reports of most substance use behaviours (though in MTF these two groups were consistently at highest risk for substance use of the major ethnic groups studied).⁵ While the lifetime and past 30-day prevalence of substance use outcomes reported here range from 20% (lifetime alcohol use) to 85% (other illicit drug use) lower than those reported in MFS, this would be expected, as the most comparable MFS students are in 1–2 grades levels higher than those surveyed here. Also, the findings that Latinos are less physically active than non-Latinos and that boys report more violence-related behaviours than girls are consistent with reports from the most recent national Youth Risk Behavior Survey data collected by the US Centers for Disease Control and Prevention.⁴ Further, with the exception of weapon carrying (18% nationally for 9th graders relative to 9% in the current sample), the prevalence estimates for the youngest YRBS participants (9th graders) are relatively similar to the following estimates from the current study: for riding with a driver who had been drinking, 33%; fighting, 45%; injured/threatened, 10%; eating five or more fruits and vegetables per day, 29%; for vigorous physical activity, 73%. Though not a substitute for expanding national studies to include some of the current study's measures, these consistencies suggests the findings may be relevant to similar multi-ethnic populations.

Differences were also observed in the health indicators within the Latino sub-sample. Latinos were generally less likely to engage in risk behaviours and more likely to use sunscreen than Latino boys. Latinos of lower social class were at higher risk for drug use. Interestingly, the only differences that were found by acculturation level were for the mental health variables. Perhaps however the higher level of optimism in the bicultural group relative to the marginalised group is a marker for differences in their health status that will be apparent later in adolescence or in adulthood.^{21, 28} These finding on the higher risk status of marginalised Latinos thus are in part consistent with recent research suggesting that persons with weak attachment to both their host and new culture may be at the highest risk for negative physical as well as mental health outcomes.²⁹ Also, despite the marginalised group overall being the second highest of the four acculturation groups in the social class indicator, the marginalised youth were significantly higher in depressive symptomatology than all other groups. Thus acculturation factors appear to be important sociocultural variables to consider in efforts to target and implement mental health services to Latino adolescents.

A limitation, as with the similar national surveys, is that the data were from self-reports. However, fewer and generally inconsequential biases have been documented for using similar questionnaire methods (biases were more prevalent and more extensive for person-to-person interviews) to assess adolescents health behaviours that do not have extensive social and legal sanction (e.g. in contrast to greater self-report biases on questions on such topics as having sex with prostitutes, same-sex sexual behaviour, injecting drugs, etc.).³¹ Also, despite attempts to be truthful, there could be problems associated with accurate recall. For instance, inaccuracy of food choice reporting has been apparent, and has been associated with demographic characteristics.³² However, measures of food choice similar to those assessed in the current study have been found to be highly related to more extensive and costly measures (e.g. 24-hour recalls),³³ suggesting their adequacy for the current research purposes.

There are other important limitations that should be considered as well. Though the CES-D has been found to be an adequate indicator of depressive symptomatology across many groups, there is some evidence its factor structure differs for adult Latino males relative to other groups.³⁴ Whether the lower reported prevalence of depressive symptomatology for Latino boys compared to Latinas correspond to equivalently differential rates of major depression can not be determined from our study. Also, it should be noted

that though we used more extensive measures of acculturation and social class than many previous related studies neither measure would be considered comprehensive. Facets of acculturation we did not assess include cultural values, cultural attitudes, and perceived discrimination.^{14, 25} As previous work has shown discrimination can account for some of the associations between social class or ethnicity and health in many contexts²⁰ the inclusion of perceived discrimination facets of acculturation would appear to be especially promising for future work. Likewise though social class was derived from reports of both parental education and perceived SES, future work could more fully describe social class by including precise reports of income—though this would likely require a study design including the youths parent’s reports to produce such data that would be valid.^{19, 23} Finally, though our response rate is higher than that achieved for comparable surveys,⁴ our inability to collect data on all potential participants is a limitation. However, because our sample was relatively young we do not suspect it is susceptible to the particularly problematic issue in adolescent research of the exclusion of school dropouts.³⁵

To be maximally effective, school and community-based health promotion programmes need to consider sociocultural characteristics of their target population.³⁶ Some of the key results suggest that programmes aimed at Latinos adolescents should include an emphasis on exercise and also increasing academic orientation. In addition to serving as a more direct motivator to avoid risk behaviour, increasing academic skills and aspirations could also positively impact future health status by furthering upward social class mobility. Parents, schools and other youth services should also be aware that Latino students without a strong cultural identity are at high risk for depressive symptomatology and the most consistent indicators of mental well-being were for those with a bicultural orientation. Further, in our study we were only able to identify the reported mental health differences between bicultural and marginalised persons through independent examination of cultural orientation toward Latinos and other groups. Future studies examining the impact of cultural change on any group, especially minorities representing immigrant and indigenous groups, but also perhaps dominant groups as they may be influenced by minority groups, may benefit from an orthogonal, bicultural, perspective.

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