



# Stress and Resilience: Key Correlates of Mental Health and Substance Use in the Hispanic Community Health Study of Latino Youth

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## Abstract

This study examined associations of immigrant generation, acculturation, and sources of stress and resilience with four outcomes—depression symptoms, anxiety symptoms, alcohol susceptibility, and smoking susceptibility. We used data from 1466 youth (ages 8–16) enrolled in the Hispanic Community Health Study of Latino Youth (SOL Youth), a probability sample of Hispanic/Latino youth living in Chicago (IL), Miami (FL), Bronx (NY), and San Diego (CA). We found no evidence of an immigrant paradox. Greater children’s acculturative stress was associated with depression/anxiety symptoms; greater parent’s acculturative stress was associated with smoking susceptibility. Family functioning and children’s ethnic identity were associated with fewer depression/anxiety symptoms and lower alcohol/smoking susceptibility. Although acculturation-related stressors increase youths’ risks for poor mental health and substance use, the development of positive ethnic identities and close, well-functioning family support systems can help protect Latino/Hispanic children from the negative behavioral and health-related consequences of stress.

**Keywords** Latino/Hispanic adolescent immigrant acculturation · Mental health and substance use · Depression/anxiety and smoking/alcohol · Immigrant paradox

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## Introduction

Hispanic/Latino youth have high rates of sadness/hopelessness (35%), current alcohol use (34%) and current tobacco use (34%) according to the 2015 Youth Risk Behavior Survey but these rates can vary by nativity [1, 2]. Early research on Hispanic/Latino adolescent mental health and substance use identified a paradox—foreign-born youth and adults often had better mental health and lower substance use than their U.S.-born peers despite the stresses of migration and their poorer socio-economic circumstances [2, 3].

Critical reviews have questioned the immigrant paradox [4, 5]. They note that previous epidemiological studies have examined the paradox using rough demographic proxies (e.g., immigrant generation, language spoken at home, or years in the U.S.) which may not accurately reflect the adoption of U.S. cultural traditions, maintenance of Hispanic/Latino traditions, development of ethnic identifications, or experience of acculturative stress.

Additionally, though conceptually distinct, effects of acculturation on health have rarely been examined together

with effects of ethnic identification. Acculturation refers to overt changes in attitudes, behaviors, and customs resulting from cross-cultural contact; whereas ethnic identity refers to the more internal development of a sense of self as a member of an ethnic group [6]. Because they may operate differently, examinations of both together are essential.

Finally, the effects of cultural stressors (e.g., discrimination) have rarely been examined controlling for the effects of other sources of stress (e.g., economic stress) or resilience (e.g., family functioning). As a result, we do not know whether cultural stressors are the driving force underlying poor mental health and substance use among Hispanic/Latino youth or whether other sources of stress or resilience are more instrumental and should serve as intervention targets.

Using newly available data, this study examines associations of immigrant generation, acculturation, and sources of stress and resilience with four key mental health and substance use outcomes—depression symptoms, anxiety symptoms, alcohol susceptibility, and smoking susceptibility. We focus on Hispanic/Latino youth ages 8–16 to capture the onset of mental health problems and substance use during the critical life stages of middle childhood and early adolescence [7, 8]. We hypothesize that cultural stressors, rather than acculturation or immigrant generation, will be the primary factors associated with poor mental health and substance use susceptibility even after accounting for other sources of stress. Additionally, we hypothesize that ethnic identity, parental closeness, and family functioning will be primary sources of resilience associated with better mental health and lower substance use susceptibility.

## Methods

### Data and Procedures

HCHS/SOL is a cohort study of 16,415 Hispanic/Latino adults (ages 18–74) selected from Chicago (IL), Miami (FL), Bronx (NY), and San Diego (CA) using a two-stage probability sample [9, 10]. In 2012–2014, SOL Youth identified a random sample of children ages 8–16 of HCHS/SOL participants and enrolled 1466 (82%). For each child interviewed, one parent—a mother, father, step-parent, or legal guardian—was also interviewed. Youth and their parents completed the interview-administered survey in their preferred language (English or Spanish). Details about the aims and methodology are published elsewhere [11, 12]. The SOL youth study was reviewed and approved by institutional review boards at the five participating universities. After deleting missing observations on dependent (< 5%) and independent (7%) variables, the analytic sample varied by outcome—depression (N = 1330), anxiety (N = 1280),

alcohol susceptibility (N = 1343), smoking susceptibility (N = 1348).

The sample includes mostly first- (21%) and second-generation (68%) children of low-income Hispanic/Latino families. With an average age of 12, the majority were male (51%), preferred English (79%) and self-identified as Mexican (52%). Parents interviewed were primarily children's biological mothers (85%) or fathers (10%), foreign-born (86%), and preferred Spanish (80%). The majority were married (53%) with at least one employed parent (83%), at least one parent who had education beyond high school (39%), household incomes of \$20,000 or less (53%), and receiving some public assistance (57%) for themselves or their children.

### Measures

All measures utilized in HCHS/SOL were previously validated in both English and Spanish [11]. For all multi-item measures, we report Cronbach alphas for continuous-item scales and the KR-20 coefficient for dichotomous-item scales calculated for the SOL Youth sample.

### Mental Health Outcomes

We measured depressive symptoms using the Children's Depression Inventory Short form (CDI-S,  $\alpha = .75$ ) and anxiety symptoms using the Multidimensional Anxiety Scale for Children (MASC-10,  $\alpha = .68$ ) [13–15]. T-scores range from 0 to 100 with a score of 65 or over indicating at-risk children with above average symptoms of depression or anxiety.

### Substance Use Susceptibility

The onset of alcohol and tobacco use increase with age but youth susceptibility can begin before age 12 [16]. We measured alcohol and smoking susceptibility using previously validated algorithms [17, 18]. Youth who had consumed alcohol in the past 30 days *or* reported that they *might try* alcohol soon, in the next year, or if a friend offered it to them were classified as susceptible to alcohol use. Similarly, youth were classified as susceptible to smoking if they reported smoking in the past 30 days, *or* reported that they *might try* a cigarette soon, in the next year, or if a friend offered it. Those who reported ever using alcohol or smoking but did not indicate current use or an intent to try again were classified as not susceptible.

### Acculturation

We used three indicators of acculturation. First, we classified parents as U.S. born, foreign-born aged 0–19 at migration, or foreign-born aged 20+ at migration. Foreign-born refers

to individuals born abroad or in a U.S. territory (e.g., Puerto Rico). Second, based on parent reports of the focal child's place of birth and parents' place of birth, we defined immigrant generations—first (foreign-born with foreign-born parents), second (U.S.-born with at least one foreign-born parent), and third (U.S.-born with two U.S.-born parents). Third, based on the Acculturation, Habits, and Interests Multicultural Scale for Adolescents (AHIMSA), we generated four orientation scores—integrated (KR-20 = .68), assimilated (KR-20 = .65), separated (KR-20 = .57), or marginalized (KR-20 = .42)—and classified youth based on the subscale with the highest score [19]. Integrated youth have both strong U.S. and strong Hispanic/Latino orientations. Assimilated youth have strong U.S. but weak Hispanic/Latino orientations. Separated/Marginalized youth have weak U.S. orientations but may have either strong (Separated) or weak (Marginalized) Latino/Hispanic orientations. Due to small numbers of marginalized ( $N=2$ ), we combined this category with separated youth.

### Stress

We measured six sources of stress for youth—discrimination, acculturation conflicts within the family (i.e. intergenerational conflict), language conflict, language consonance/dissonance, economic stress, and neighborhood disorder. Racial/ethnic discrimination, intergenerational conflict, and language conflict were measured as part of a 9-item acculturative-stress index ( $\alpha_{\text{child}} = .73$ ,  $\alpha_{\text{adult}} = .76$ ) which consisted of two language-conflict items ( $r_{\text{child}} = .52$ ,  $r_{\text{adult}} = .80$ ), four intergenerational-conflict items ( $\alpha_{\text{child}} = .64$ ,  $\alpha_{\text{adult}} = .67$ ), and three discrimination items ( $\alpha_{\text{child}} = .63$ ,  $\alpha_{\text{adult}} = .68$ ) asked of both youth and their parent [20]. Calculated as the average across all items, scores ranged from 1 (low) to 5 (high). Language consonance measured whether parents and youth both preferred English, both preferred Spanish, or preferred different languages. To measure economic stress (KR-20<sub>adult</sub> = .65), parents indicated whether they had experienced any of the five following hardships in the past 12 months: lack of phone service, inability to make rent/mortgage payments, evictions, inability to make utility payments, or food insecurity [21]. To measure neighborhood disorder ( $\alpha_{\text{adult}} = .88$ ), parents indicated whether five factors (e.g., assaults or muggings, gangs, or drug use) were (1) not a problem, (2) somewhat of a problem, or (3) a big problem [22]. Averaged across items, scores ranged from 1 to 3.

### Resilience

Based on youth self-reports, we measured four sources of resilience for youth—own ethnic identity, parental closeness, family functioning, and social support. Our ethnic identity measure consisted of eight items—five items measuring

ethnic affirmation and belonging from the Multigroup Ethnic Identity Measure (MEIM) and three items measuring ethnic centrality and regard from the Multidimensional Model of Racial Identity (MMRI) [23, 24]. Factor analysis (not shown) confirmed that all items identified a single factor. Therefore, we averaged all 8-items to create a single ethnic identity index ( $\alpha_{\text{child}} = .80$ ), ranging from 1 (low) to 5 (high). Parental closeness ( $\alpha_{\text{child}} = .57$ ) consists of an average of 3-items measuring the primary parent's closeness, caring, and warmth [21]. The 12-item General Functioning scale from the McMaster Family Assessment Device assessed family functioning with questions regarding communication and understanding [25]. Items were averaged to create an index ranging from 1 to 4, with higher scores indicating better family functioning ( $\alpha_{\text{child}} = .77$ ). Social support ( $\alpha_{\text{child}} = .76$ ) was calculated as the average of the four-item friendship subscale from the Multidimensional Scale of Perceived Social Support [26].

Based on the parents' self-reports, we measured an additional three sources of resilience—parental ethnic identity, parenting style, and parental familism. The parental ethnic identity ( $\alpha_{\text{adult}} = .86$ ) measure utilized the same questions and scoring as the youth's ethnic identity measure. Parenting style was measured along two dimensions—demandingness ( $\alpha_{\text{adult}} = .78$ ) and responsiveness ( $\alpha_{\text{adult}} = .73$ ) using the Authoritative Parenting Index [27]. Items from the 7-item responsiveness and 7-item demandingness subscales were each averaged separately and ranged from 1 (low) to 4 (high). The 5-item Familial Support subscale ( $\alpha_{\text{adult}} = .66$ ) from the Attitudinal Familism Scale assessed beliefs about obligations to emotionally and financially support immediate and extended family members [28]. Items were averaged to compute a score ranging from 1 (low) to 5 (high).

### Covariates

We controlled for Hispanic/Latino background (Mexican, Other Central American, Dominican, Puerto Rican, Cuban, and other Hispanic/Latino or South American), sex, age, parents' marital status, parents' highest education, household income, household size, and child's language preference. To better account for poverty, we also controlled for any public assistance use (e.g., TANF) by parents or their child in the past 12 months. Control variables for location of residence were never significant and were excluded from the analysis for parsimony.

### Analysis

We began our analysis examining differences in depression and anxiety symptoms and alcohol and smoking susceptibility by child's sex, Hispanic/Latino background, immigrant generation and parent's nativity. We then evaluate

differences in social/behavioral acculturation, sources of stress, and sources of resilience by child's immigrant generation. Next, we estimated partially adjusted OLS regression models for depression and anxiety symptoms and logistic regression models for alcohol and smoking susceptibility. Adjusted for only age, sex, and child's language preference, these models provided bivariate associations between each of our dependent variables and each source of stress and resilience. Finally, we estimated fully adjusted models to assess which sources of stress and resilience predicted each of our four outcomes. For parsimony, fully-adjusted models only included those sources of stress and resilience associated with one or more outcomes in our partially-adjusted models as well as age, sex, child's language preference, parents' marital status, parents' highest education, household income and size, and any public assistance use. All analyses were performed using STATA, accounting for sampling weights and clustering. Few data were missing (< 1%) on any one independent variable. Models imputing missing data revealed no meaningful differences in our results.

## Results

### Mental Health and Substance Use Susceptibility

Among Hispanic/Latino youth, 5.70% were at risk of depression, 11.20% were at risk of anxiety, 18.87% had ever drunk alcohol, and 8.55% had ever smoked (Table 1). Though females reported significantly higher symptoms of depression than males, neither anxiety symptoms nor the susceptibility to alcohol or smoking differed by sex. Additionally, we identified few differences by Hispanic background.

Depression symptoms, alcohol susceptibility, and smoking susceptibility did not vary by immigrant generation. However, we observed greater symptoms of anxiety among first- and second-generation youth compared to the third-generation. Additionally, children with a foreign-born parent had significantly more symptoms of anxiety and higher susceptibility to alcohol use.

### Social/Behavioral Acculturation and Sources of Stress and Resilience

We found substantial variations in social/behavioral acculturation and sources of stress and resilience by immigrant generation (Table 2). First-generation youth were most likely to have integrated/bicultural orientations. Third- and, to a lesser extent, second-generation youth were more likely to be assimilated. In all generations, few youth reported separated/marginalized orientations.

We also identified higher levels of acculturative stress among both foreign-born youth and their parents than among

the U.S.-born third-generation. For both children of immigrants and their parents, acculturation-related intergenerational and language conflicts emerged as primary stressors. Reports of discrimination were relatively low and did not vary substantially across immigrant generations. Highlighting language conflict as a source of stress, 34% of first-generation and 19% of second-generation youth reported dissonant language preferences from their parents. Finally, parent economic stress and neighborhood disorder were greater among the families of third- versus first- or second-generation youth.

Though sources of stress varied across immigrant generation, sources of resilience remained relatively stable. In comparison to third-generation youth, we found only that first-generation youth reported more social support, the parents of first- and second-generation youth reported greater familism, and the parents of second-generation youth were significantly less demanding. Children's and parents' ethnic identity, parental closeness, and family functioning did not vary across immigrant generation.

### Partially-Adjusted Associations with Sources of Stress and Resilience

Adjusted only for age, sex, and child's language preference, we found that second-generation youth experienced greater symptoms of anxiety and that assimilated and separated/marginalized youth had higher symptoms of depression (Table 3). In contrast, we found strong positive associations between each outcome and both youth's and parent's acculturative stress. Furthermore, depressive symptoms were associated with economic stress and neighborhood disorder. Stronger ethnic identities, greater parental closeness, better family functioning, and more social support were each negatively associated with one or more outcomes (i.e. depression, anxiety, alcohol susceptibility and/or smoking susceptibility). Among parental sources of resilience, parenting responsiveness was the only measure significantly associated with any outcome.

### Fully-Adjusted Associations with Sources of Stress and Resilience

In our fully-adjusted models, we continued to observe significantly more anxiety symptoms among second-generation youth than among third-generation youth (Table 4). We also continued to observe significant positive associations between *youth's* acculturative stress and both depression and anxiety symptoms. However, associations between social/behavioral acculturation and depression symptoms and between *parents'* acculturative stress and anxiety symptoms were no longer significant in the fully-adjusted models.

**Table 1** Mean depression and anxiety T-scores and alcohol and smoking susceptibility, by sex, child's Hispanic background, and parent's and child's nativity

	Sample (%)	Depression (CDI-10) (N = 1330)		Anxiety (MASC10) (N = 1280)		Alcohol susceptibility (N = 1343)		Smoking susceptibility (N = 1348)	
		M/%	95% CI	M/%	95% CI	M/%	95% CI	M/%	95% CI
<b>Full sample</b>									
Total T-score	–	47.33	(46.74–47.93)	51.31	(50.51–52.11)	–	–	–	–
T-score > 65 (%)	–	5.70	(4.18–7.21)	11.20	(8.74–13.66)	–	–	–	–
Susceptibility (%)	–	–	–	–	–	40.12	(36.27–44.09)	19.66	(16.92–22.71)
Ever use (%)	–	–	–	–	–	18.87	(15.94–22.20)	8.55	(6.44–11.28)
Used in past 30 days (%)	–	–	–	–	–	5.84	(3.79–7.90)	2.20	(1.08–3.33)
<b>Youth's sex (%)</b>									
Females	49.12	48.41	(47.52–49.31)	51.17	(50.02–52.32)	39.5	(34.65–44.35)	19.77	(15.75–23.79)
Males	50.88	46.29	(45.56–47.02)***	51.45	(50.35–52.56)	40.72	(35.32–46.11)	19.54	(15.67–23.41)
<b>Youth's Hispanic background (%)</b>									
Mexican (ref)	51.88	47.46	(46.57–48.35)	51.96	(50.75–53.17)	39.25	(33.84–44.67)	22.31	(17.76–26.87)
Other central American	7.87	47.90	(46.19–49.62)	50.74	(48.51–52.97)	30.76	(20.20–41.33)	22.30	(14.62–29.98)
Dominican	14.35	47.50	(45.72–49.28)	49.56	(47.59–51.54)*	53.89	(42.22–65.56)*	12.27	(5.98–18.57)*
Puerto Rican	12.15	48.09	(46.63–49.55)	50.81	(48.85–52.76)	39.42	(27.30–51.54)	18.93	(12.74–25.13)
Cuban	6.19	45.14	(43.45–46.83)*	50.73	(48.42–53.05)	32.27	(20.69–43.86)	11.07	(3.69–18.45)*
Other Hispanic	7.56	46.17	(44.93–47.41) <sup>a</sup>	52.16	(50.13–54.20)	36.95	(25.93–47.97)	20.88	(12.51–29.25)
<b>Youth's immigrant generation (%)</b>									
U.S.-born (3rd + generation, ref)	10.97	47.88	(46.32–49.45)	47.88	(45.40–50.37)	32.19	(21.95–42.43)	16.35	(8.82–23.88)
U.S.-born (2nd generation)	67.79	47.49	(46.77–48.22)	51.98	(51.04–52.92)**	40.16	(35.45–44.86)	18.70	(15.33–22.07)
Foreign-born (1st generation)	21.25	46.54	(45.40–47.68)	51.00	(49.43–52.56)*	44.14	(34.88–53.40) <sup>a</sup>	24.43	(16.92–31.93)
<b>Parents' nativity (%)</b>									
U.S.-born (ref)	14.00	47.30	(46.01–48.59)	48.86	(46.67–51.05)	30.25	(21.63–38.88)	16.01	(9.59–22.42)
<b>Foreign born</b>									
Age 0–19 at migration	31.33	47.67	(46.51–48.83)	51.41	(49.96–52.85) <sup>a</sup>	42.37	(35.29–49.46)*	16.16	(11.40–20.92)
Age 20+ at migration	54.67	47.15	(46.37–47.93)	51.90	(50.83–52.96)*	41.38	(36.44–46.32)*	22.58	(18.38–26.77) <sup>a</sup>

All estimates are weighted to adjust sampling probabilities for non-response and age-standardized to the year 2010 Census population in each data collection location. Standard errors are adjusted for clustering by location. Puerto-Rican's born in the territory of Puerto Rico are treated as foreign-born in this analysis

<sup>a</sup>p < 10; \* p ≤ .05; \*\*p ≤ .01; \*\*\*p ≤ .001

Although we found no association between youth's acculturative stress and substance use susceptibility in fully-adjusted models, we did find a positive association between parents' acculturative stress and youth's smoking susceptibility. At the same time, economic stress and neighborhood disorder were no longer significantly associated with any outcome after controlling for acculturative stress and other measures of socio-economic status.

Among the sources of resilience measured, family functioning had the most consistent association with lower depression symptoms, anxiety symptoms, alcohol susceptibility and smoking susceptibility. Parental closeness also contributed to lower depression symptoms, alcohol susceptibility, and smoking susceptibility. Youth's ethnic identity

contributed to lower depression (but not anxiety) symptoms and smoking (but not alcohol) susceptibility. Social support contributed to lower anxiety symptoms. Among the sources of resilience from parents, we found that low demandingness and high responsiveness—an authoritative parenting style commonly associated with healthy child development [27]—reduced depression symptoms.

## Discussion

Previous research on Hispanic/Latino youth identified a paradox—foreign-born youth had better mental health and lower substance use than their U.S.-born peers despite the

**Table 2** Explanatory variables, by child's immigrant generation

	Total		U.S.-born 3rd + genera- tion (ref)		U.S. -born 2nd generation		Foreign-born 1st genera- tion	
	M/%	(95% CI)	M/%	(95% CI)	M/%	(95% CI)	M/%	(95% CI)
Child's social acculturation (%)								
Integrated	59.33	(56.01–62.57)	47.35	(36.60–58.35)	57.92	(53.80–61.94) <sup>a</sup>	70.01	(62.78–76.36) <sup>***</sup>
Assimilated	32.39	(29.12–35.84)	46.73	(36.96–56.75)	34.24	(30.33–38.38) <sup>*</sup>	19.05	(13.98–25.43) <sup>***</sup>
Separated/Marginalized	8.28	(6.45–10.58)	5.92	(2.79–12.15)	7.83	(5.74–10.61)	10.94	(7.01–16.68)
Sources of stress								
Child's acculturative stress								
Total index	1.60	(1.56–1.65)	1.48	(1.38–1.59)	1.60	(1.55–1.65) <sup>a</sup>	1.68	(1.59–1.78) <sup>**</sup>
Discrimination	1.46	(1.41–1.50)	1.44	(1.29–1.59)	1.46	(1.40–1.52)	1.47	(1.38–1.56)
Intergenerational conflict	1.74	(1.69–1.80)	1.60	(1.47–1.73)	1.74	(1.68–1.81) <sup>a</sup>	1.81	(1.68–1.94) <sup>*</sup>
Language conflict	1.55	(1.49–1.61)	1.32	(1.20–1.43)	1.52	(1.45–1.59) <sup>**</sup>	1.76	(1.61–1.90) <sup>***</sup>
Parent's acculturative stress								
Total index	1.74	(1.69–1.80)	1.37	(1.26–1.47)	1.76	(1.69–1.82) <sup>***</sup>	1.90	(1.79–2.00) <sup>***</sup>
Discrimination	1.69	(1.63–1.75)	1.68	(1.48–1.87)	1.66	(1.59–1.74)	1.77	(1.65–1.88) <sup>a</sup>
Intergenerational conflict	1.57	(1.52–1.63)	1.28	(1.16–1.40)	1.59	(1.52–1.66) <sup>***</sup>	1.67	(1.56–1.78) <sup>***</sup>
Language conflict	2.18	(2.07–2.28)	1.09	(1.01–1.16)	2.23	(2.10–2.36) <sup>***</sup>	2.56	(2.36–2.76) <sup>***</sup>
Parent-child lang. consonance (%)								
Both prefer English	19.45	(16.07–23.36)	80.72	(68.88–88.79)	14.01	(10.55–18.37) <sup>***</sup>	5.21	(2.88–9.26) <sup>***</sup>
Both prefer Spanish	60.04	(55.71–64.23)	13.05	(6.48–24.55)	67.28	(62.10–72.06) <sup>***</sup>	61.22	(53.57–68.36) <sup>***</sup>
Dissonant language preferences	20.50	(16.86–24.70)	6.23	(2.47–14.81)	18.72	(14.52–23.78) <sup>***</sup>	33.56	(26.64–41.28) <sup>***</sup>
Economic stress (P)	0.88	(0.78–0.97)	1.21	(0.90–1.53)	0.82	(0.71–0.94) <sup>*</sup>	0.88	(0.72–1.04) <sup>a</sup>
Neighborhood disorder (P)	1.55	(1.50–1.61)	1.74	(1.59–1.90)	1.56	(1.49–1.63) <sup>*</sup>	1.44	(1.34–1.54) <sup>**</sup>
Sources of resilience								
Child Ethnic Identity Index	4.30	(4.26–4.34)	4.34	(4.23–4.45)	4.26	(4.21–4.31)	4.42	(4.34–4.50)
Parental closeness	4.67	(4.63–4.70)	4.72	(4.63–4.80)	4.66	(4.62–4.70)	4.67	(4.60–4.73)
Family functioning	3.08	(3.05–3.11)	3.06	(2.96–3.16)	3.07	(3.03–3.11)	3.12	(3.05–3.19)
Social support	3.18	(3.14–3.22)	3.10	(2.98–3.23)	3.17	(3.12–3.22)	3.26	(3.18–3.34) <sup>*</sup>
Parent Ethnic Identity Index (P)	4.48	(4.43–4.53)	4.37	(4.21–4.53)	4.49	(4.42–4.55)	4.52	(4.43–4.61)
Parenting: demandingness (P)	3.58	(3.54–3.61)	3.69	(3.61–3.76)	3.55	(3.51–3.60) <sup>**</sup>	3.59	(3.52–3.65) <sup>a</sup>
Parenting: responsiveness (P)	3.12	(3.09–3.15)	3.19	(3.11–3.27)	3.11	(3.07–3.15) <sup>a</sup>	3.12	(3.07–3.17)
Parental familism (P)	4.10	(4.03–4.17)	3.92	(3.76–4.07)	4.10	(4.01–4.18) <sup>*</sup>	4.19	(4.09–4.29) <sup>**</sup>
Total N	1348		148		914		286	

All estimates are weighted to adjust sampling probabilities for non-response and age-standardized to the year 2010 Census population in each data collection location. Standard errors are adjusted for clustering by location. (P) indicates parent report

<sup>a</sup> $p < .10$ ; <sup>\*</sup> $p \leq .05$ ; <sup>\*\*</sup> $p \leq .01$ ; <sup>\*\*\*</sup> $p \leq .001$

stresses of migration and their poorer socio-economic circumstances [2]. We found no evidence of an immigrant paradox among participants in the SOL Youth study. First- and second-generation Hispanic/Latino children of immigrants and their parents experienced greater acculturative stress than third-generation youth and this stress was associated with poorer mental health and susceptibility to both alcohol use and smoking.

Previous research regarding the immigrant paradox in youth has often assumed that measures such as immigrant generation, years in the U.S., and language use adequately reflected the acculturation process [29–33]. Yet these

measures do not distinguish U.S.-culture acquisition from Hispanic/Latino culture retention or social/behavioral acculturation from ethnic identification [5]. Additionally, previous research has often conflated acculturative stress with “other sources of stress unrelated to acculturation [4]”.

In the present study, we adopted a more nuanced approach to acculturation and acculturative stress showing that acculturation to U.S. cultural traditions can occur both with and without the loss of Hispanic/Latino cultural traditions as well as with the maintenance of strong ethnic identities across immigrant generations. Across generations, youth acculturative stress due to racial/ethnic discrimination, parent–youth

**Table 3** Partially adjusted regressions of depression or anxiety T-scores (OLS) and alcohol and smoking susceptibility (logistic)

	Depression (CDI-10) (N = 1330)		Anxiety (MASC10) (N = 1280)		Alcohol susceptibil- ity (N = 1343)		Smoking suscepti- bility (N = 1348)	
	Beta	(95% CI)	Beta	(95% CI)	OR	(95% CI)	OR	(95% CI)
Youth's immigrant generation								
U.S.-born (3rd + generation, ref)	–	–	–	–	–	–	–	–
U.S.-born (2nd generation)	–0.13	(–1.85 to 1.59)	3.91	(1.29–6.53)***	1.28	(0.72–2.29)	1.06	(0.56–1.99)
Foreign-born (1st generation)	–0.86	(–2.84 to 1.11)	2.68	(–0.28 to 5.64)	1.18	(0.59–2.36)	1.27	(0.63–2.55)
Youth's social acculturation								
Integrated (ref)	–	–	–	–	–	–	–	–
Assimilated	1.29	(0.12–2.47)*	0.94	(–0.65 to 2.53)	1.00	(0.71–1.42)	0.86	(0.59–1.24)
Separated/Marginalized	3.07	(0.34–5.80)*	1.75	(–1.48 to 4.98)	0.84	(0.42–1.67)	0.98	(0.43–2.24)
Sources of stress								
Child's acculturative stress								
Total index	3.82	(2.49–5.15)***	4.06	(2.70–5.42)***	1.60	(1.18–2.17)**	1.53	(1.10–2.13)*
Discrimination	3.57	(2.52–4.63)***	1.97	(0.86–3.09)***	1.41	(1.12–1.77)**	1.16	(0.88–1.53)
Intergenerational conflict	1.91	(1.02–2.81)***	2.46	(1.32–3.61)***	1.34	(1.08–1.66)**	1.35	(1.06–1.72)*
Language conflict	1.05	(0.09–2.01)*	–0.40	(1.11–3.13)***	1.11	(0.91–1.35)	1.19	(0.96–1.48)
Parent's acculturative stress								
Total index	0.88	(–0.03 to 1.79)	1.65	(0.57–2.73)**	1.27	(0.99–1.64) <sup>a</sup>	1.51	(1.16–1.95)**
Discrimination	0.41	(–0.29 to 1.11)	0.58	(–0.31 to 1.48)	1.15	(0.95–1.39)	1.24	(1.00–1.54)*
Intergenerational conflict	0.73	(–0.09 to 1.55)	1.56	(0.57–2.54)**	1.40	(1.11–1.77)**	1.45	(1.15–1.84)**
Language conflict	0.38	(–0.14 to 0.91)	0.70	(–0.01 to 1.42)*	1.00	(0.86–1.16)	1.16	(1.00–1.34)*
Parent–child language consonance								
Both prefer English (ref)	–	–	–	–	–	–	–	–
Both prefer Spanish	0.15	(–1.28 to 1.58)	1.05	(–1.33 to 3.43)	1.19	(0.77–1.86)	1.28	(0.80–2.06)
Dissonant language preferences	0.90	(–0.87 to 2.67)	1.33	(–1.49 to 4.14)	0.88	(0.49–1.57)	1.27	(0.70–2.31)
Economic stress (P)	0.51	(0.03–0.99)*	0.32	(–0.39 to 1.02)	0.96	(0.84–1.10)	1.19	(1.03–1.37)*
Neighborhood disorder (P)	1.07	(0.05–2.08)*	0.32	(–0.89 to 1.52)	1.25	(0.95–1.65)	1.13	(0.84–1.52)
Sources of resilience								
Child Ethnic Identity Index	–2.41	(–3.41 to –1.41)***	–0.46	(–1.59 to 0.67)	0.69	(0.52–0.91)**	0.62	(0.45–0.84)**
Parental closeness	–3.88	(–5.26 to –2.50)***	0.15	(–1.69 to 1.99)	0.44	(0.31–0.62)***	0.46	(0.33–0.63)***
Family functioning	–5.42	(–6.84 to –4.00)***	–3.59	(–5.31 to –1.87)***	0.47	(0.33–0.67)***	0.40	(0.28–0.56)***
Social support	–1.75	(–2.76 to –0.75)***	–1.65	(–3.02 to –0.29)*	0.79	(0.60–1.05)	0.88	(0.68–1.15)
Parent Ethnic Identity Index (P)	–1.03	(–2.06 to 0.01) <sup>a</sup>	–0.55	(–1.66 to 0.55)	0.91	(0.70–1.17)	0.80	(0.63–1.01) <sup>a</sup>
Parenting: demandingness (P)	–0.15	(–1.44 to 1.13)	0.47	(–1.35 to 2.29)	0.85	(0.59–1.23)	0.72	(0.48–1.07)
Parenting: responsiveness (P)	–2.11	(–3.56 to –0.66)**	–0.72	(–2.77 to 1.32)	0.90	(0.60–1.35)	0.84	(0.53–1.32)
Parental familism (P)	–0.06	(–0.98 to 0.86)	–0.70	(–1.86 to 0.45)	1.16	(0.91–1.48)	1.05	(0.79–1.39)

Estimates are weighted to adjust sampling probabilities for non-repose and age-standardized to the year 2010 Census population in each data collection location. Standard errors are adjusted for clustering by location. All estimates control for age, sex (male = 1), and child's language preference (Spanish = 1). Regressions on parent–child language consonance do not include child's language preference as a control variable. (P) indicates parent report

<sup>a</sup> $p < .10$ ; \*  $p \leq .05$ ; \*\*  $p \leq .01$ ; \*\*\*  $p \leq .001$

intergenerational conflicts, and language conflicts were the primary contributors to depression and anxiety in youth. Parents' acculturative stress contributed to youth's smoking (but not alcohol) susceptibility. Importantly, these associations persisted after controlling for economic stress and neighborhood disorder.

Ethnic identity provided a critical source of resilience to youth, protecting them from both poor mental health and substance use even after accounting for social/behavioral acculturation and acculturative stress. These results underscore the importance of considering ethnic identification, social/behavioral acculturation, and acculturative stress

**Table 4** Fully adjusted regressions of depression or anxiety T-scores (OLS) and alcohol and smoking susceptibility (logistic)

	Depression (CDI-10) (N = 1330)		Anxiety (MASC10) (N = 1280)		Alcohol susceptibil- ity (N = 1343)		Smoking suscepti- bility (N = 1348)	
	Beta	95% CI	Beta	95% CI	OR	95% CI	OR	95% CI
Youth's immigrant generation								
U.S.-born (3rd + generation, ref)	–	–	–	–	–	–	–	–
U.S.-born (2nd generation)	–0.51	(–2.13 to 1.11)	3.69	(1.15–6.24)**	1.30	(0.71–2.37)	0.83	(0.42–1.62)
Foreign-born (1st generation)	–1.02	(–2.83 to 0.78)	1.89	(–1.04 to 4.82)	1.19	(0.58–2.45)	1.07	(0.50–2.27)
Youth's social acculturation								
Integrated (ref)	–	–	–	–	–	–	–	–
Assimilated	0.18	(–0.96 to 1.32)	0.41	(–1.13 to 1.95)	0.82	(0.56–1.22)	0.70	(0.47–1.03)
Separated/Marginalized	1.45	(–0.85 to 3.76)	0.23	(–2.72 to 3.17)	0.69	(0.34–1.40)	0.77	(0.37–1.60)
Sources of Stress								
Child's Acculturative Stress Total Index	2.56	(1.15–3.96)***	3.59	(2.13–5.04)***	1.34	(0.94–1.91)	1.17	(0.84–1.63)
Parent's Acculturative Stress Total Index	0.20	(–0.73 to 1.13)	0.87	(–0.26 to 2.00)	1.23	(0.94–1.61)	1.37	(1.05–1.81)*
Economic Stress (P)	0.35	(–0.10 to 0.79)	0.53	(–0.18 to 1.25)	0.95	(0.82–1.11)	1.07	(0.92–1.26)
Neighborhood disorder (P)	0.12	(–0.90 to 1.15)	–0.21	(–1.43 to 1.01)	1.27	(0.94–1.71)	0.91	(0.65–1.27)
Sources of resilience								
Child Ethnic Identity Index	–1.08	(–2.06 to –0.09)*	0.75	(–0.52 to 2.01)	0.81	(0.60–1.10)	0.68	(0.49–0.95)*
Parental closeness	–2.18	(–3.51 to 0.84)***	1.87	(–0.03 to 3.77) <sup>a</sup>	0.52	(0.36–0.77)***	0.56	(0.39–0.80)***
Family functioning	–2.74	(–4.09 to –1.38)***	–2.73	(–4.69 to –0.77)**	0.66	(0.45–0.98)*	0.58	(0.38–0.88)**
Social support	–0.19	(–1.13 to 0.76)	–1.33	(–2.63 to –0.02)*	0.97	(0.72–1.31)	1.23	(0.89–1.70)
Parent Ethnic Identity Index (P)	–0.68	(–1.62 to 0.27)	–0.67	(–1.73 to 0.39)	0.92	(0.70–1.20)	0.85	(0.66–1.10)
Parenting: demandingness (P)	1.77	(0.38–3.17)**	1.67	(–0.30 to 3.63) <sup>a</sup>	0.91	(0.60–1.36)	0.84	(0.52–1.38)
Parenting: Responsiveness (P)	–1.77	(–3.28 to –0.26)*	–0.35	(–2.38 to 1.68)	1.17	(0.72–1.89)	1.28	(0.75–2.19)
Model R <sup>2</sup>	0.20		0.10		–		–	
Model F-statistic	8.13		3.33		6.44		4.82	

Estimates are weighted to adjust sampling probabilities for non-response and age-standardized to the year 2010 Census population in each data collection location. Standard errors are adjusted for clustering by location. All estimates control for age, gender (male = 1), child's language preference (Spanish = 1), parents' marital status, parents' highest education, household income, household size, and any public assistance use. (P) indicates parent report

<sup>a</sup>p < .10; \* p ≤ .05; \*\* p ≤ .01; \*\*\* p ≤ .001

separately when ascertaining the links between acculturation and youth outcomes [5].

Similarly, family functioning and closeness provided a consistent source of resilience across all mental health and substance use outcomes considered. Living in sometimes disordered or impoverished communities, the Hispanic/Latino children of immigrants may have few sources of support in their schools and neighborhoods. Thus, the capacity to obtain this support from within their families becomes critical.

Though this study allows for a more comprehensive consideration of acculturation processes than have previous studies of mental health and substance use among Hispanic/Latino youth, some important limitations remain. The current data are cross-sectional and can only be generalized to youth ages 8–16 residing in the four cities included in

the sample. They do not reflect youth living in emerging Latino/Hispanic settlement communities. They also do not contain information on parents' legal immigration status or on early-childhood stressful life exposures that have been found to affect children's risk for mental health problems and substance use [32, 34, 35]. Additionally, we had insufficient power to conduct analyses disaggregated by Hispanic background or to evaluate differences by location of residence. To make new strides in understanding the health of Hispanic/Latino youth, future research is needed with larger, multi-site and multi-ethnic Hispanic/Latino samples, longitudinal designs, and more detailed comprehensive measures of acculturation and associated stressors.

Hispanic/Latino children of immigrants and their parents experience a variety of acculturation-related stressors. Although these stressors increase youths' risks for poor



mental health and substance use, the development of positive ethnic identities and close, well-functioning family support systems can help protect children from the negative behavioral and health-related consequences of stress. Programs to help Hispanic/Latino children of immigrants and their parents cope with acculturative stress should focus on helping children develop positive ethnic identities and helping their parents to develop skills in nurturing their children through the complexities of growing up in the United States.

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### Compliance with Ethical Standards

**Conflict of interest** The authors declare no conflicts of interest.

**Informed Consent** Informed consent was obtained from all individual participants included in this study.

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