Cultural Stress, Emotional well-being, and Health Risk Behaviors among Recent Immigrant Latinx families: The Moderating Role of Perceived Neighborhood Characteristics

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Abstract

Latinx families can experience cultural stressors, which can negatively influence their emotional and behavioral health. Few studies have examined if perceived neighborhood characteristics buffer against or exacerbate the negative effects of cultural stress on adolescent and parent health outcomes. To address this gap in the literature, this study investigated how parent (social cohesion, informal social control, extent of problems) and adolescent (support) perceived neighborhood factors moderated the associations of parent and adolescent cultural stress with parent and adolescent emotional and behavioral well-being. Data came from waves 1 and 3 of a six-wave longitudinal survey with 302 recent immigrant Latinx adolescents (47% female, Mage = 14.51 years) and their parents (74% mothers, Mage = 41.09 years). Results indicated that when parents reported low levels of neighborhood problems, adolescent cultural stress did not predict adolescent

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health risk behaviors. However, adolescent and parent cultural stress predicted higher levels of adolescents' sense of hope when parents perceived low levels of neighborhood problems. Furthermore, adolescent and parent cultural stress predicted higher youth depressive symptoms and health risk behaviors when positive neighborhood factors (informal social control, social cohesion) were high. Similarly, adolescent and parent cultural stress predicted lower adolescents' sense of hope and self-esteem when positive neighborhood factors were high. These findings indicate that efforts to reduce the negative effects of cultural stress on youth emotional and behavioral health may benefit from combating neighborhood problems. Results further indicate that research is needed to clarify unexpected findings. Directions for future research are discussed.

Keywords

Ethnic discrimination; Negative context of reception; Acculturative stress; Neighborhood context; Latina/o; Emotional and behavioral health

Introduction

Adolescence is a time of rapid change and many transitions (Coleman 2011) that can make some adolescents more vulnerable for developing emotional (e.g., depressive symptoms, low self-esteem) and behavioral health (e.g., aggression, substance use) problems (e.g., CDC 2017; Gibson and Miller 2010; Johnston et al. 2015). Rapid changes and transitions in adolescence may result in psychological stress—the experiences appraised by the person as taxing or exceeding his/her resources. Such stress can be a major determinant of adolescent emotional and behavioral health (e.g., Cervantes et al. 2012; Lorenzo-Blanco and Unger 2015). Also, research shows that, psychological stress in adolescence may enhance genetic influences on adolescent emotional and behavioral health, contributing to adolescents' risk for experiencing emotional and behavioral health problems (Dick et al. 2016).

In the United States (US), adolescence may be more stressful for Latinx[1] youth than youth from other racial or ethnic backgrounds. The majority of Latinx youth are first (11%) or second (52%) generation immigrants (Fry and Passel 2009). They are often expected to reconcile their cultural heritage with US American culture (Romero et al. 2018) and they belong to an ethnic group that is often demonized and scapegoated (Chavez 2013). These experiences may negatively influence Latinx youth's emotional and behavioral well-being. Compared to non-Latinx White and Black youth, Latinx adolescents often report higher rates of depressive symptoms (CDC 2017) and health risk behaviors such as cigarette smoking, alcohol use, and aggressive behavior (Gibson and Miller 2010; Johnston et al. 2015). These health disparities are concerning for the nation, given that 25% of children in the US K-12 school system identify as Latinx, and by 2050, 30% of newborn children are likely to be Latinx (U.S. Census Bureau 2017).

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[1]Latinx is a gender-neutral alternative to Latino, Latina, and Latina/o. It is used by scholars, activists, and national associations. It is part of a linguistic revolution to move beyond gender binaries and be inclusive of the intersecting identities of Latin American descendants. In addition to boys, girls, men, and women, Latinx makes room for people who identify as trans, queer, agender, non-binary, gender non-conforming or gender fluid (Santos 2017).

Importantly, adolescent depressive symptoms and health risk behaviors may be influenced by ecological contexts embedded within larger socio-cultural structures (Garcia Coll et al. 1996). For example, some Latinx groups and Spanish language use can be viewed as a threat to other Americans (Chavez 2013). As a result, Latinx families may experience cultural stressors, such as, perceived discrimination (i.e., perceived differential and unfair treatment; Pérez et al. 2008), a negative context of reception (i.e., feeling unwelcome in the U.S.; Schwartz et al. 2014), and acculturative stress (i.e., having to balance different cultural demands; Torres et al. 2012). These three cultural stressors (i.e., discrimination, a negative context of reception, and acculturative stress) have been conceptualized (and analyzed) as one a multifaceted "cultural stress" construct (e.g., Cano et al. 2015; Lorenzo-Blanco et al. 2016a), and cultural stress is an important social determinant of low emotional and behavioral health among Latinx youth and parents (e.g., Cervantes et al. 2012; Gassman-Pines 2015). However, evidence indicates that Latinx immigrant youth and parents often report better emotional and behavioral health than their US-born counterparts (Garcia-Coll and Marks 2012). One possible reason for this immigrant paradox might be that US born immigrant families have had more opportunities to experience cultural stress that may negatively impact their emotional and behavioral health (Garcia-Coll and Marks 2012).

While cultural stress has received considerable attention in the Latinx emotional and behavioral health literatures (e.,g. Cervantes et al. 2012; Lorenzo-Blanco and Unger 2015), few studies have examined how the effects of cultural stress on emotional and behavioral health outcomes might be shaped by adolescents' and parents' perceived neighborhood characteristics (e.g., Garcia Coll et al. 1996). For example, among Latinx adolescents and parents, perceptions of supportive or cohesive neighborhoods might buffer against the negative effects of cultural stress on emotional and behavioral health outcomes (e.g., Nair et al. 2013), whereas neighborhoods low on these characteristics or high in risk and danger might exacerbate the harmful effects of cultural stress (Pearlin et al. 1981). The present study investigated this possibility by testing how neighborhood characteristics moderated the effects of parent and adolescent cultural stress on adolescent and parent emotional and behavioral health outcomes.

Theoretical basis: Ecodevelopmental and social stress process theories

This study was grounded in *ecodevelopmental theories* (Garcia Coll et al. 1996), which posit that adolescent development may be influenced by multiple proximal (i.e., settings in which adolescents directly participate) and distal (i.e., settings in which adolescents do not directly participate) contexts that may interact with each other. One such contextual influence are cultural stressors directed toward and experienced by adolescents and their parents, including perceived discrimination (Lorenzo-Blanco et al. 2017), a negative context of reception (Schwartz et al. 2014), and acculturative stress (Torres et al. 2012).

Additional influences on Latinx youth development may include adolescents' and parents' perceived neighborhood experiences, such as their perceptions of neighborhood problems (e.g., White et al. 2012), social cohesion and support among neighbors (Nair et al. 2013; Vega et al. 2011), and informal social control (i.e., the degree to which neighbors monitor the behaviors and whereabouts of each other's children; Sampson et al. 1997).

As such, according to ecodevelopmental theories, adolescents' and parents' cultural stress and perceived neighborhood characteristics may interact with each other to influence the emotional and behavioral health of youth and parents (Garcia Coll 1996).

Moreover, theories of social stress processes propose that the degree to which cultural stress influences the emotional and behavioral health of youth and parents may depend on individuals' access to or lack of material supports and handicaps (Pearlin et al. 1981). According to these theories, individuals with higher access to material support may be less negatively affected by cultural stress compared to individuals who lack material support or who experience material handicaps. Sources of material support may include neighborhoods perceived by individuals as supportive and/or cohesive (i.e., neighborhood social cohesion and support) and in which neighbors monitor each other's children (i.e., neighborhood informal social control; Sampson et al. 1997). Sources of material handicap may include neighborhoods perceived by individuals as (a) high in risks and problems such as gangs, drugs, graffiti, and violence (e.g., White et al. 2012) and (b) lacking cohesion, support, and informal social control (e.g., Cutrona et al. 2005; Vega et al. 2011). Thus, according to social stress process theories (e.g., Pearlin et al. 1981), negative neighborhood characteristics (i.e., high neighborhood problems/risk) may intensify the harmful effects of cultural stress on emotional and behavioral health outcomes, while positive neighborhood characteristics (i.e., high informal social control, high social cohesion and support, low neighborhood problems/ risk) may buffer against the harmful effects of cultural stress.

Cultural stress, depressive symptoms, and health risk behaviors

Latinx families' cultural stress experiences may affect their emotional and behavioral health (e.g., Cervantes et al. 2012; Nair et al. 2013). For example, in a longitudinal analysis with the same sample of recent immigrant Latinx adolescents (Mage = 14.51 years; Schwartz et al. 2015), higher adolescent cultural stress (i.e., acculturative stress, discrimination, and a negative context of reception) at baseline predicted (after controlling for baseline continuous outcome variables) higher adolescent depressive symptoms, higher aggressive behavior, and increased odds of cigarette smoking and alcohol use six months post-baseline. Moreover, in a related longitudinal analysis using the same sample of recent immigrant Latinx parents (Mage = 41.04 years) and adolescents (Mage = 14.51 years), a cross-lagged analysis based on the first four waves of data (i.e. over a two year period) indicated that higher parent cultural stress (i.e., acculturative stress, discrimination, and a negative context of reception) at earlier timpoints predicted higher symptoms of depression in parents (Lorenzo-Blanco et al. 2016a) at later timepoints but not vice versa. Parent cultural stress and parent depressive symptoms, in turn, predicted increased youth smoking and drinking one year later. In a daily diary study (Gassman-Pines 2015) with Mexican immigrant parents, parents reported that, on days when they experienced workplace discrimination, they themselves experienced lower emotional well-being, and parents observed more internalizing and externalizing behaviors in their children. In all, these studies suggest that parent and adolescent cultural stress may negatively influence the emotional and behavioral health of adolescents and parents.

Perceived neighborhood characteristics, emotional, and behavioral health

Latinx families' neighborhood context may affect many aspects of their lives, including their emotional health (e.g., Behnke et al. 2011), engagement in health risk behaviors (e.g., Lardier et al. 2017), and cultural stress levels (e.g., Cutrona et al. 2005). In a cross-sectional study with Latinx adolescents (Behnke et al. 2011), perceived neighborhood risk was associated with lower adolescent self-esteem and higher symptoms of depression. In a longitudinal study with Mexican American families (White et al. 2012), parents' perceived neighborhood risk predicted higher adolescent symptoms of anxiety and greater risk for mood disorders. In another longitudinal study with Mexican American families (Gonzales et al. 2011), parents' perceived neighborhood risk predicted greater adolescent aggressive behavior, conduct problems, and ADHD symptoms. Additionally, in a three-year longitudinal study with Mexican American youth (Mage = 10.9 years) and parents (Mage mothers = 35.9 years and Mage fathers = 38.8 years; Nair et al. 2013), high levels of year 1 parent perceived neighborhood cohesion buffered against the negative effect of year 1 language hassles on girls' year 3 externalizing symptoms, and year 1 language hassles predicted increased year 3 externalizing symptoms in boys when parents' year 1 perceived neighborhood cohesion was low. Nair et al.'s (2013) findings indicate that parent perceived neighborhood characteristics may indeed moderate the association of cultural stress (i.e., language hassles and discrimination) with externalizing behaviors. However, this study did not assess parent cultural stressors and it focused on the moderating role of parent perceived neighborhood cohesion, leaving out other protective and risk-enhancing neighborhood characteristics such as parent perceived informal social control, adolescent perceived neighborhood support, and perceived neighborhood problems, providing limited insights into aspects of neighborhood factors that may protect against or enhance the harmful effects of cultural stress on emotional and behavioral health outcomes. Also, while several studies have documented the direct relationships of parent perceived neighborhood characteristics with adolescent health outcomes, only one study has examined how perceptions of neighborhood characteristics may have shaped the effects of cultural stress on youth outcomes (Nair et al. 2013). Moreover, most studies with Latinx families have focused on neighborhood risk and danger, and less is known about the influence of social neighborhood factors such as social cohesion, social control, and neighborhood support.

Current study

The primary aim of the present study was to test *whether* and *how* positive and negative parent- and adolescent-perceived neighborhood experiences moderated the associations of parent and adolescent cultural stress with emotional and behavioral health outcomes among recent immigrant Latinx families. As such, based on the literature reviewed above, this study developed the conceptual model depicted in Fig. 1, in which parent and adolescent reported neighborhood factors serve as moderators of the effects of parent and adolescent cultural stress on parent and youth outcomes. The present study tested this conceptual model using waves 1 and 3 of a longitudinal study with recent immigrant Latinx families. This study focuses on recent immigrant families because they have recently settled into their receiving communities, and as such, cultural stress and neighborhood experiences may be more salient for these families. Data from waves 1 and 3 of a six-wave longitudinal

study were used because in prior longitudinal work with the same families, latent growth curves for adolescents (Schwartz et al. 2015) and parents (Lorenzo-Blanco et al. 2016b) indicated that cultural stress for adolescents did not change over time ($\bar{x}_{Slope} = -.29$, $p = .26$; Schwartz et al. 2015) and for parents ($\bar{x}_{Slope} = -.185$, $p < .01$; Lorenzo-Blanco et al. 2016b) cultural stress decreased overtime. Moreover, cultural stress within the early years following immigration appeared to have the greatest negative impact on emotional and behavioral health outcomes. As such, this study aimed at determining how neighborhood factors might reduce or exacerbate the effects of cultural stress at a time when cultural stress may be most salient and have the greatest impact on health outcomes. The focus on the early years following immigration may provide insights about the optimal timing for preventive interventions at the neighborhood level to reduce the negative effects of cultural stress among recent immigrant Latinx families.

The present study included positive (i.e., social cohesion, support, and informal social control) and negative (i.e., risk and danger) neighborhood factors because understanding how positive and negative neighborhood experiences may differentially impact Latinx families can provide vital insights about neighborhood components that require intervention to reduce the harmful effects of cultural stress. For parents, this study included perceptions of social cohesion, informal social control, and neighborhood problems because these neighborhood characteristics can create an environment in which parents share values regarding acceptable youth behaviors within their neighborhood, and parents may work together to supervise and monitor the behaviors and well-being of their children. For adolescents, this study included adolescents' perceived neighborhood support because from an adolescent's perspective, young people are more likely to accurately appraise the support they are receiving than to know about neighborhood social control and cohesion.

Cultural stress was assessed for both adolescents and parents because, according to ecodevelopmental theories discussed above, parent cultural stress may affect adolescent health, and adolescent cultural stress may affect parents' health. A range of emotional (i.e., hope, self-esteem, depressive symptoms) and behavioral health outcomes (i.e., aggressive behaviors, cigarette smoking and alcohol use) were included for adolescents, and depressive symptoms was included for parents. A range of emotional and behavioral health outcomes were included for adolescents because it is important to understand how social processes such as cultural stress and neighborhood factors impact the emotional and well-being of Latinx youth, a group that has been traditionally underrepresented in health research. Parent depressive symptoms were included because among Latinx families, parent depressive symptoms have been linked with adolescent emotional and behavioral health.

Based on the literature reviewed above, and guided by the aims of the study, it was expected that positive neighborhood experiences (i.e., higher T1 parent perceived social cohesion, higher T1 parent perceived informal social control, higher T1 adolescent perceived social support) would buffer against the effects of higher parent and adolescent cultural stress (T1) on lower emotional and behavioral health (i.e., higher T3 youth depressive symptoms, higher T3 youth aggressive behavior, higher T3 youth cigarette smoking, higher T3 youth alcohol use, and higher T3 parent depressive symptoms). Conversely, it was hypothesized

that negative neighborhood experiences (i.e., higher T1 parent perceived neighborhood problems) would exacerbate the effects of higher parent and adolescent cultural stress (T1) with lower emotional and behavioral health (T3) among parents (i.e., higher depressive symptoms) and adolescents (i.e., higher depressive symptoms, higher aggressive behavior, higher cigarette smoking, and higher alcohol use).

Methods

Sample

The present data were taken from a six-wave longitudinal study on acculturation, cultural stress, mental health, and substance use among recent Latinx immigrant families (Schwartz et al. 2014). Because this study aimed to test how neighborhood factors may exacerbate or mitigate the negative effects of cultural stress on health outcomes in the early years of immigration (when cultural stress seems to be highest and have the greatest impact on families), it utilized available data from waves 1 and 3.

The sample consisted of 302 adolescent-caregiver dyads from Los Angeles ($N = 150$) and Miami ($N = 152$). Only adolescent-caregiver dyads who identified as Latinx and had resided in the US for five years or less at baseline were eligible to participate. About 47% of adolescents were female, and the mean adolescent age at baseline was 14.51 years ($SD = .88$; Range = 13–17 years). Each adolescent participated with a primary caregiver (referred to as "parent" for simplicity; 74% mothers, 22% fathers, 2% stepparents, and 2% grandparents/other relatives). The mean parent age was 41.09 years at baseline ($SD = 7.02$; Range = 22–64 years). About 80% of parents reported an annual income of less than $25,000, and 78.6% had graduated from high school. Miami families were primarily from Cuba (61%), the Dominican Republic (8%), Nicaragua (7%), Honduras (6%), and Colombia (6%). Los Angeles families were primarily from Mexico (70%), El Salvador (9%), and Guatemala (6%). Almost all adolescents (98%) and parents (98%) reported Spanish as their "first or usual language"; 82% of adolescents and 87% parents reported "speaking mostly Spanish at home"; and 16% of adolescents and 11% of parents reported speaking "English and Spanish equally at home."

Procedures

School selection and participant recruitment—Families were recruited from randomly selected schools in Miami-Dade and Los Angeles Counties (10 schools in Miami and 13 in Los Angeles). Schools whose student body was at least 75% Latinx were selected to be part of this study. The study was approved by the Institutional Review Boards at the University of Miami, the University of Southern California, and the Research Review Committees for each participating school district.

Assessment procedures—Baseline data were gathered during the summer of 2010 and wave 3 data collection occurred during fall 2011. Assessments were available in Spanish and English and were completed using an audio computer-assisted interviewing (A-CASI) system (Turner et al. 1998). Parents provided informed consent for themselves and for their adolescents, and adolescents provided informed assent. Parents received $40 at baseline,

with incentives increasing by $5 at each subsequent timepoint. Adolescents received a movie ticket voucher at each timepoint.

Measures

Parent cultural stress—Parent cultural stress was assessed at T1. It was treated as a latent variable and measured in terms of perceived discrimination, negative context of reception, and acculturative stress.

Perceived discrimination: Perceived discrimination was measured using the 7-item Perceived Discrimination Scale (Phinney et al. 1998; α = .87; Sample item: "How often do people your age treat you unfairly or negatively because of your ethnic background?"). This measure uses a 5-point Likert response format ranging from 0 (*Not at all*) to 4 (*Almost always*).

Negative context of reception: Negative context of receptions was measured with a 6-item scale developed using the present dataset (Schwartz et al. 2014; α = .83; Sample item: "I don't have the same chances in life as people from other countries). Parents indicated the degree to which they agreed with each statement on a scale ranging from 0 *(Not at all)* to 4 *(Strongly Agree).*

Acculturative stress: Acculturative stress was measured using 24 items from the Multidimensional Acculturative Stress Inventory, which assesses stress that originates from US (sample item: "It bothers me that I speak English with an accent") and Latinx sources (sample item: "I feel pressure to speak Spanish") (MASI; Rodríguez (2012)). Parents indicated, using a Likert Scale, ranging from 0 (*Not at all stressful*) to 4 (*Extremely stressful*), the degree to which they each item applied to them (α = .93).

Adolescent cultural stress—Adolescent cultural stress was assessed at T1. It was treated as a latent variable and measured in terms of perceived discrimination, a negative context of reception, and bicultural stress.

Perceived discrimination: Perceived discrimination was measured using the 7-item Perceived Discrimination Scale (Phinney et al. 1998; α = .87; Sample item: "How often do people your age treat you unfairly or negatively because of your ethnic background?"). This measure uses a 5-point Likert response format ranging from 0 (*Not at all*) to 4 (*Almost always*).

Negative context of reception: Negative context of receptions was measured with a 6-item scale developed using the present dataset (Schwartz et al. 2014; α = .83; Sample item: "I don't have the same chances in life as people from other countries). Adolescents indicated the degree to which they agreed with each statement on a scale ranging from 0 *(Not at all)* to 4 *(Strongly Agree).*

Bicultural stress: Bicultural stress was measured using 20 items from the Bicultural Stress Scale (Romero and Roberts, 2003; α = .89; Sample item: "I feel embarrassed because of my accent). This measure taps into stressors originating from both Latinx and US cultural

streams. Adolescents rated on a scale ranging from 0 *(Never happened to me)* to 4 *(Very stressful)* the extent to which each statement applied to them.

Parents' perceived neighborhood characteristics—Parents' perceived neighborhood characteristics were assessed at T1 in terms of parents' perceived social neighborhood cohesion (Sampson et al. 1997), informal social control (Sampson et al. 1997), and extent of problems (Gorman-Smith et al. 1999).

Social neighborhood cohesion: Parent social neighborhood cohesion was assessed at T1 with five items from the Neighborhood Scale (Sampson et al. 1997; sample items: "People in my neighborhood share the same values" and "People in my neighborhood get along with each other"; α = .65). Parents rated, on a scale ranging from 0 *(Strongly Disagree)* to 4 *(Strongly Agree)*, the degree with which they agreed with each statement.

Informal social control: To assess parent informal social control at T1, this study used four items from the Neighborhood Scale (Sampson et al. 1997; sample items: "My neighbors would get involved if a fight brought out in front of their house" and "My neighbors would get involved if children were skipping school and hanging out on the street corner"; α = .81). Parents rated the likelihood of their neighbors engaging in a list of behaviors on a scale ranging from 0 *(Very Likely)* to 4 *(Very Unlikely)*. The four items were recoded so that higher scores represent higher levels of informal social control.

Extent of problems: Parent extent of problems was assessed at T1 with four questions (Gorman-Smith et al. 1999; sample questions: "How much trouble are gangs/graffiti/drugs/ violent crime in your neighborhood?"; α = .93). Parents indicated on a scale ranging from 0 *(Not at All)* to 5 *(A Serious Problem)* the extent to which crime, drugs, graffiti, and gangs are a problem in the neighborhood.

Adolescents' perceived neighborhood characteristics—Adolescents' perceived neighborhood characteristics were assessed at T1 using four questions about adolescents' perceived neighborhood support. Adolescents rated the degree to which they felt supported by their neighborhood (α = .78). Sample questions included: "How much do you believe that your neighborhood cares about you?" and "How much do you believe that your neighborhood cares about the good things young people do?" Response options ranged from 0 (*Not at All*) to 3 (*A Lot*).

Parent depressive symptoms—Parent depressive symptoms were assessed at T1 and T3 using the Center for Epidemiologic Studies Depression Scale (CES-D; Radloff, 1977); α = .93), sample item: "I felt depressed"). Parents indicated on a scale ranging from 0 (*Strongly disagree*) to 4 (*Strongly agree*), how depressed they have felt during the past week. Higher scores indicate greater depressive symptoms.

Adolescent depressive symptoms—Adolescent depressive symptoms were assessed at T1 and T3 using the Center for Epidemiologic Studies Depression Scale (CES-D; Radloff 1977); α = .93, sample item: "I felt like crying this week"). Adolescents indicated on a

scale ranging from 0 (*Strongly disagree*) to 4 (*Strongly agree*), how depressed they have felt during the past week. Higher scores indicate greater depressive symptoms.

Adolescent hope—Adolescent hope was measured at T1 and T3 with the Children's Hope Scale (Edwards et al. 2007). This measure consists of six items and measures the extent to which young people are optimistic about their future (α = .86; Sample item: "I can think of many ways to get the things in life that are most important to me"). Response options ranged from 0 (*None of the Time*) to 5 (*All of the Time*).

Adolescent self-esteem—Adolescent self-esteem was assessed at T1 and T3 with 10 items (α = .74; Sample item: "I feel that I have a number of good qualities") from the Rosenberg (1968) Self-Esteem Scale. This measure has been used widely with Spanish-speaking populations (Schmitt and Allik (2005)). Response options ranged from (*Strongly Disagree*) to 4 (Strongly Agree).

Adolescent aggressive behavior—Adolescent aggressive behavior was assessed at T1 and T3 with 17 items from the Youth Self-Report (YSR; Achenbach and Rescorla (2002)) (α = .93, sample item: "I am mean to others"). Adolescents rated, on a scale ranging from 0 (*Not true*) to 2 (*Often or very often true*), their behavior in the past six months.

Adolescent cigarette and alcohol use—Adolescent cigarette and alcohol use were assessed at T3 with a modified version of the Monitoring the Future survey (Johnston et al. 2015). Adolescents were asked about the frequency of their lifetime and past 90-day cigarette and alcohol use. A binary variable (1 = *Use* vs. 0 = *Nonuse*) was created at T1 and 3 because of low base rates and the need to control for prior levels of these behaviors. Although it is most common to analyze substance use in the 30 days prior to assessment (Johnston et al. 2015), analyses were conducted using past 90-day cigarette and alcohol use because base rates for past 30-day smoking and drinking were low. Illicit substance use was not included because only eight adolescents reported lifetime use at T3.

Analytic plan

This study utilized a step-wise approach to data analysis. First, it conducted descriptive analyses with SPSS version 22.0 (SPSS IBM, 2012). It then, conducted structural equation analyses in Mplus version 7.2 (Muthén and Muthén 1998–2012) using a sandwich covariance estimator (Kauermann and Carroll 2001) to adjust the standard errors to account for nesting of participants within schools. Cases with missing data were included in analyses using full-information maximum likelihood estimation. A structural equation model (SEM) was tested based on the theoretical model depicted in Fig. 1. The main effects of cultural stress (T1) and neighborhood factors (T1) on health outcomes (T3) were tested in the same SEM model. As such, T1 cultural stress (for adolescents and parents) and T1 neighborhood factors (for adolescents and parents) were allowed to directly influence T3 adolescent and parent outcomes (see Table 3, column 2). Additionally, analyses tested for the moderating effects of T1 neighborhood factors (for parents and adolescents) in the effects of T1 cultural stress (for parents and adolescents) on T3 adolescent and parent health outcomes by adding eight interaction terms to the model (see Table 3, column 5). Fit of the structural equation

model was evaluated by first testing the model without the categorical health outcomes because modeling categorical outcomes in robust maximum likelihood estimation does not produce fit indices (Muthén and Muthén 1998–2012). The categorical health outcomes were added to the model after good model fit had been established. Model fit was evaluated using the comparative fit index (CFI), the root mean square error of approximation (RMSEA), and the Standardized Root Mean Square Residual (SRMR). According to values suggested by Little (2013), good fit is represented as CFI .95, RMSEA .06, and SRMR .06. Although the χ^2 value is reported, it was not used to gauge model fit because it tests a null hypothesis of perfect fit, which is rarely plausible with large samples or complex models (Davey and Savla 2010).

The third step built on the analyses conducted in the first step and used the simple slopes approach to probe for moderation effects that were statistically significant in the first step of analysis (see Table 3, columns 5–7; Hayes 2013). Significant moderation effects were probed by examining whether significant moderation occurred at the following values of the T1 neighborhood factors: low (i.e., two standard deviations below the mean), average (i.e., the mean), and high (i.e., two standard deviations above the mean; Hayes 2013). The probing for significant moderation effects allows for the interpretation of interaction effects (Hayes 2013; see Tables 2 and 3).

All analyses controlled for youth age, gender, years spent in the US, and baseline continuous health outcome variables. Analyses did not control for baseline categorical health outcomes because scores on categorical variables can remain the same over time even when developmental change has occurred (Agresti 2007). Additionally, controlling for prior levels of categorical outcomes can result in inflated standard errors for model parameters, potentially rendering baseline-adjusted results unstable or invalid (Glymour et al. 2005).

Results

Step 1: Descriptive statistics

Table 1 displays descriptive statistics for all study variables. Table 2 shows bivariate correlations among all study variables.

Step 2: Structural equation modeling

The specified model without categorical outcome variables produced good model fit: $\chi^2(20)$ = 33.875, p = .037; CFI = .973; RMSEA = .050, SRMR = .033. The categorical health outcomes were then added to the model.

Main effects of cultural stress (T1) and neighborhood factors (T1) on outcomes (T3)

As shown in Table 3 (columns 2–4), higher adolescent cultural stress predicted higher adolescent depressive symptoms (β = .180, p < .05), lower adolescent hope (β = −.241, p < .001), lower adolescent self-esteem (β = −.200, p < .001), higher aggressive behavior (β = .258, p < .05), and greater odds of adolescent smoking (OR = 1.821, p < .001). Additionally, higher adolescent perceived neighborhood support was associated with higher adolescent hope (β = .128, p < .041), and higher parent perceived neighborhood cohesion

was associated with lower youth alcohol use (OR = .649, $p < .05$) and higher parent depressive symptoms (β = .123, $p < .05$).

Interaction effects of neighborhood factors (T1)—Analyses indicated fourteen significant interaction effects—five interaction effects on the association of parent cultural stress with health outcomes (Fig. 2a–e) and nine interaction effects on the association of adolescent cultural stress with health outcomes (Fig. 2f–n). In terms of the association of parent cultural stress with outcomes, adolescent perceived neighborhood support (T1) was a significant moderator in the effect of parent cultural stress (T1) on adolescent T3 depressive symptoms (Fig. 2a; β = .163, $p < .05$; see columns 5–7 in Table 3; Hayes 2013). Moreover, parent reports of neighborhood cohesion (T1; Fig. 2b; β = −.148; $p < .05$), informal social control (T1; Fig. 2c; β = .116, $p < .05$) and extend of neighborhood problems (T1; Fig. 2d; β = −.145, $p < .05$) qualified as significant moderators in the associations of parent cultural stress (T1) with T3 adolescent hope. Parent perceived neighborhood cohesion (T1) also moderated the effect of parent cultural stress (T1) on T3 adolescent alcohol use (Fig. 2e; OR = 1.654, $p < .05$). In regards to the association of adolescent cultural stress with health outcomes, parent perceived informal social control (T1) significantly moderated the associations of adolescent cultural stress (T1) with adolescent T3 hope (Fig. 2f; β = −.205, $p < .001$), self-esteem (Fig. 2g; β = −.089, $p < .05$), aggressive behavior (Fig. 2h; β = .173, $p < .001$), cigarette smoking (Fig. 2i; OR = 1.564, $p < .05$), and alcohol use (Fig. 2j; OR = 1.497, $p < .05$). Parent extent of problems (T1) also moderated the links from adolescent cultural stress (T1) with T3 adolescent hope (Fig. 2k; β = −.147, $p < .001$), aggressive behavior (Fig. 2l; β = .133, $p < .05$), and cigarette smoking (Fig. 2m; OR = 1.620, $p < .001$). Lastly, adolescent perceived neighborhood support (T1) qualified as significant moderator in the association of adolescent cultural stress (T1) with adolescent self-esteem (Fig. 2n; T3; β = −.148; $p < .05$).

Step 3: Probing of significant interaction effects

As shown in Tables 4 and 5, higher parent cultural stress (T1) predicted lower adolescent depressive symptoms (T3) only when adolescent perceived social support (T1) was low (Fig. 2a; β = −.357, $p < .05$). Additionally, parent cultural stress (T1) predicted higher adolescent hope (T3) when parent neighborhood cohesion (T1) was low (Fig. 2b; β = .267, $p < .05$) and it predicted lower adolescent hope (T3) when parent neighborhood cohesion was high (Fig. 2b; β = −.280, $p < .05$). Parent cultural stress (T1) also predicted lower adolescent hope (T3) when parent perceived informal social control (T1) was low (Fig. 2c; β = −.220, $p < .05$), and it predicted higher adolescent hope (T3) when parent perceived informal social control (T1) was high (Fig. 2c; β = .207, $p < .05$). Moreover, parent cultural stress (T1) predicted higher adolescent hope (T3) when parent extend of neighborhood problems (T1) were low (Fig. 2d; β = .245, $p < .001$), and it predicted lower adolescent hope (T3) when parent extend of neighborhood problems (T1) were high (Fig. 2d; β = −.258, $p < .05$). Additionally, parent cultural stress (T1) predicted higher adolescent alcohol use (T3) only when parent perceived neighborhood cohesion (T1) was high (Fig. 2e; OR = 2.42, $p < .05$), and it predicted lower adolescent alcohol use (T3) when parent perceived neighborhood cohesion (T1) was low (Fig. 2e; OR = .40, $p < .05$). In terms of adolescent cultural stress, adolescent cultural stress (T1) predicted lower adolescent hope (T3) when parent perceived informal social control

(T1) was average (Fig. 2f; β = −.237, $p < .001$) or high (Fig. 2f; β = −.664, $p < .001$) and when parent extend of neighborhood problems (T1) were average (Fig. 2k; β = −.237, $p < .001$) or high (Fig. 2k; β = −.512, $p < .001$). Moreover, adolescent cultural stress (T1) predicted lower self-esteem (T3) when parent perceived informal social control (T1) was average (Fig. 2g; β = −.196, $p < .001$) or high (Fig. 2g; β = −.382, $p < .001$) and when adolescent perceived neighborhood support (T1) was average (Fig. 2n; β = −.196, $p < .001$) or high (Fig. 2n; β = −.464, $p < .001$). Additionally, adolescent cultural stress (T1) predicted lower aggressive behavior (T3) when parent perceived informal social control (T1) was low (Fig. 2h; β = −.158, $p < .05$), but it predicted higher adolescent aggressive behavior (T3) when parent perceived informal social control (T1) was average (Fig. 2h; β = .205, $p < .05$) or high (β = .569, $p < .001$). Adolescent cultural stress (T1) also predicted higher adolescent smoking (T3) only when parent perceived informal social control (T1) was average (Fig. 2i; OR =1.82, $p < .001$) or high (Fig. 2i; OR = 4.45, $p < .001$). Further, adolescent cultural stress (T1) predicted higher adolescent alcohol use (T3) when parent perceived informal social control was high (Fig. 2j; OR = 2.42, $p < .05$). In addition, adolescent cultural stress (T1) predicted higher adolescent aggressive behavior (T3) when parent perceived extent of problems was average (Fig. 2l; β = .205, $p < .001$) or high (Fig. 2l; β = .445, $p < .001$). Lastly, adolescent cultural stress (T1) predicted higher adolescent smoking (T3) when parent perceived extent of problems were average (Fig. 2m; OR = 1.82, $p < .001$) or high (Fig. 2m; OR = 4.78, $p < .000$).

Discussion

Informed by ecodevelopmental (e.g., Garcia Coll et al. 1996) and social stress process theories (e.g., Pearlin et al. 1981), this longitudinal study with recent immigrant Latinx families examined the degree to which parent and adolescent perceived neighborhood characteristics moderated the relationships of adolescent and parent cultural stress with adolescent and parent emotional and behavioral health outcomes. Studies have documented the negative influences of cultural stress on the emotional and behavioral health of Latinx families (e.g., Lorenzo-Blanco et al. 2016a). Studies have also linked neighborhood experiences with the health and well-being of Latinx families (e.g., Behnke et al. 2011). However, few studies, have investigated how positive and negative perceived neighborhood characteristics may buffer against or exacerbate the impact of cultural stress on emotional and behavioral well-being among Latinx families. Thus, the overall goal of the present study was to test whether positive neighborhood experiences (i.e., high neighborhood cohesion, high informal social control, high neighborhood support) buffered against the negative effects of cultural stress on the emotional and behavioral health of families, and whether negative neighborhood experiences (i.e., high extent of neighborhood problems) exacerbated these effects. This study aimed at determining how neighborhood factors might reduce or exacerbate the effects of cultural stress on emotional and behavioral health outcomes in the early years following immigration. It focused on the early years following immigration because in prior work with the same families, cultural stress appeared to be highest during this time and it also appeared to have the greatest negative impact on emotional and behavioral health outcomes during this time (e.g., Schwartz et al. 2015; Lorenzo-Blanco et al. 2016b).

Consistent with the study's hypotheses, adolescent cultural stress predicted higher adolescent aggressive behavior and higher likelihood of adolescent cigarette smoking—but only when parents perceived average or high amounts of neighborhood problems. Also, as expected, adolescent cultural stress predicted lower adolescent hope only when parents perceived average or high amounts of neighborhood problems. These findings indicate that, as perceived by parents, neighborhoods low in crime, drugs, gangs, and graffiti may have buffered against the negative effects of cultural stress on youth hope, aggression and cigarette smoking. Important to note is that the direct effect of adolescent cultural stress on adolescent hope, aggression and cigarette smoking was significant. Moreover, parent cultural stress predicted lower adolescent hope only when parents perceived high amounts of neighborhood problems. Given that the main effect of parent cultural stress on adolescent hope was not significant, this finding indicates that high amounts of parent perceived neighborhood problems might exacerbate the negative effects of parent cultural stress on adolescent hope. Interestingly, parent cultural stress predicted higher adolescent hope when parents perceived low levels of neighborhood problems, suggesting that neighborhoods perceived by parents as low in crime, drugs, and gangs may promote adolescent hope when parents experience cultural stress. Thus, in all, these findings suggest that preventive interventions to reduce the negative effects of cultural stress on adolescent emotional and behavioral well-being may benefit from policies and community efforts to reduce neighborhood crime, graffiti, drugs, and gangs (e.g., Leventhal and Brooks-Gunn 2003).

Moreover, as expected, higher parent cultural stress predicted lower youth hope only when parents reported low levels of informal social control. However, parent cultural stress predicted higher youth hope when parents reported high levels of informal social control. These findings indicate, that parents' perceptions of living in neighborhoods in which adults support and monitor each other's children, may foster adolescent's sense of hope when parents face cultural stress, whereas parents' perceptions of living in neighborhoods low on informal social control appear to exacerbate the negative effects of parent cultural stress on adolescents' sense of hope. This pattern of results may indicate that preventive interventions aimed at fostering adolescent hope and reducing the negative effects of parent cultural stress on adolescent hope could benefit from efforts to improve neighbors' tendency to support and monitor each other's children (Sampson et al. 1997).

Surprisingly, adolescent cultural stress predicted lower adolescent aggressive behavior when parent perceived neighborhood social control was low, whereas adolescent cultural stress predicted higher adolescent aggressive behavior, higher adolescent cigarette smoking, higher adolescent alcohol use, lower adolescent hope, and lower self-esteem when parent perceived informal social control was average or high. These findings are surprising because theory indicates that neighborhoods high on informal social control should promote the emotional well-being of adolescents and prevent adolescents from engaging in health risk behaviors because neighbors will actively support each other and monitor the behaviors of adolescents in the neighborhood (Sampson et al. 1997). As such, it was expected that high parent social control would reduce and low parent social control would maintain or exacerbate the negative effects of cultural stress on youth emotional and behavioral health outcomes. However, the findings suggest the opposite—low informal social control may buffer against

the negative effects of adolescent cultural stress and high informal social control may maintain or exacerbate these effects.

One possible explanation for these unexpected findings might be that parents modify their parenting strategies to be responsive to their perceived neighborhood experiences (e.g., Ceballo et al. 2012). These possible changes in parenting strategies may, in turn, affect adolescents' emotional well-being and health risk behaviors (e.g., Peña et al. 2017). For example, in a qualitative study with poor Latina mothers who faced neighborhood poverty and threat of community violence, mothers coped with these neighborhood risks by engaging in strict monitoring of their children and by establishing strong parent-child communication (Ceballo et al. 2012). It is possible that in the present study, parents who reported lower neighborhood informal social control engaged in more parental monitoring and communication with their adolescents, which, in turn, may have protected youth from the negative effects of adolescent cultural stress, resulting in lower youth aggression. It is also possible that parents who perceived low social control may have encouraged their children to stay in the home, thereby, protecting youth from cultural stressors they may experience outside the home (e.g. discrimination; Garcia Coll et al. 1996). Conversely, it is possible that parents who reported higher perceived informal social control, maintained or engaged in less parental monitoring and communication with their children, thereby, not protecting youth from the negative effects of cultural stress (e.g., Peña et al. 2017). Future research could benefit from further unpacking these relationships through in-depth qualitative interviews that would allow parents and youth to describe how parents may adjust their parenting behaviors to be responsive to the needs created by cultural stress and low perceived informal social control.

Also contrary to the hypotheses, the findings suggest that neighborhoods perceived by adolescents and parents as highly supportive or cohesive may exacerbate the negative effects of cultural stress on adolescents emotional and behavioral health, whereas neighborhoods perceived as low on support or cohesion appear to promote adolescent well-being when adolescents and parents experience cultural stress. In the present study, higher parent cultural stress predicted lower adolescent depressive symptoms when adolescent perceived neighborhood social support was low. Moreover, adolescent cultural stress predicted lower adolescent self-esteem when adolescent perceived neighborhood support was average or high. Additionally, higher parent cultural stress predicted higher adolescent hope and lower alcohol use when parent perceived neighborhood cohesion was low, but it predicted lower adolescent hope and higher adolescent alcohol use when parent perceived neighborhood cohesion was high. These findings were unexpected because social stress process and social disorganization theories (Sampson et al. 1997; Pearlin et al. 1981) predict that neighborhoods high on support for adolescents and parent perceived social cohesion would buffer against the negative effects of parent cultural stress, whereas neighborhoods low on these characteristics would maintain or exacerbate the negative effects of cultural stress.

One possibility for the first finding might be that when parents experience cultural stress and youth perceive low neighborhood support, families may cope with these experiences by becoming more cohesive as a family, which, in turn, may protect youth from the harmful effects of parent cultural stress (e.g., Perreira et al. 2006). It is further possible that,

although adolescents and parents may perceive themselves as residing in neighborhoods that are generally supportive to young people and in which neighbors generally maintain cohesive relationships, adolescents and parents in the present study *themselves* may not feel supported or included in their neighborhood (maybe because they experience cultural stressors in their neighborhood). This potential disconnect between families' general perceived neighborhood support/cohesion and families' subjective experiences of feeling supported/included may negatively impact youth depressive symptoms, youth self-esteem, youth hope, and youth alcohol use when adolescents and/or parents experience cultural stress (Suárez-Orozco et al. 2009). In other words, it is possible that when families perceive to live in a supportive and cohesive neighborhood but families nonetheless experience hostility and isolation, that this hostility and isolation more strongly affects adolescents' emotional and behavioral well-being. Future research might be strengthened by assessing families' overall perceptions of neighborhood support/cohesion (e.g., "How much do you think your neighborhood cares about the good things *young people* do?" and "*People in my neighborhood* feel supported) *and* families' subjective experience of how they *themselves* feel supported/included (e.g., "How much do you think *your* neighborhood cares about *you* or the good things *you* do?" and "*I* feel supported in my neighborhood"). Research is also needed that replicates the study's findings and examines the reasons for why low adolescent reported neighborhood support and low parent reported neighborhood cohesion promoted the emotional and behavioral well-being of adolescents when families experience cultural stress.

Another possibility for the unexpected findings might be the present's study use of perceived neighborhood measures that were originally developed for use with non-Latinx urban youth and parents (Sampson et al. 1997). As such, it is possible that the study's measures of perceived social neighborhood cohesion, informal social control, and neighborhood support did not accurately capture perceptions of neighborhood social cohesion, informal social control, and neighborhood support among this sample of recent immigrant Latinx families. Readers should keep this in mind when interpreting unexpected findings. Future neighborhood research with recent immigrant Latinx families could be strengthened by employing measures validated for use with recent immigrant Latinx families or by conducting cognitive interviews to see if and how survey questions require modification to accurately capture neighborhood perceptions among recent immigrant Latinx families (e.g., Willis 2005).

The findings of the present study should be interpreted in light of some important limitations. First, the results may not generalize to all Latinx families in the US Data were collected in relatively well-established Latinx receiving communities with ethnic enclaves that may buffer against cultural stress experiences. As such, the results may not generalize to families who move into new settlement communities (e.g., Deep South, Pacific Northwest); communities that have less experience interacting with newcomers and where sources of support might not be available (Rodríguez 2012). The findings may also not generalize to Latinx families who are well-established in their receiving communities (e.g., long-term immigrants, US born families, etc.). Also, because the majority of participants reported low cigarette smoking, alcohol use, aggressive behavior, and depressive symptoms, while reporting high levels of hope and self-esteem, the findings may not generalize to

adolescents and/or parents with more emotional and behavioral health problems. Second, the present study did not gather descriptive information about the neighborhoods in which families resided which prevented us from including objective measures of neighborhood characteristics and describing families in relation to their neighborhoods. As such, future research on the moderating role of neighborhood factors in the association of cultural stress with health outcomes could be strengthened by gathering descriptive and objective information about families' neighborhoods and including these variables in conceptual and statistical models. Third, although, this study included adolescent and parent reports of cultural stress, neighborhood factors, and health, not all of the adolescent variables matched the parent variables. Future studies should aim at replicating the results of this study by using the same variables for adolescents and parents. Fourth, although the inclusion of both adolescent and parent data represents a strength of the current study, future studies could also include data from additional sources such as teachers, siblings, and peers. Collecting data from additional informants could provide a more complete understanding of the multiple contexts that can influence how cultural stress impacts the health and well-being of families. Fifth, given the correlational design of the present study, it is not possible to make causal inferences about its findings. Sixth, although this study included well-established neighborhood measures, adolescents and parents reported on overall perceptions of their neighborhood and future studies may benefit from subjective measures of adolescents' and parents' neighborhood perceptions. Lastly, the results from the present study do not provide information about the mechanisms by which some neighborhood perceptions appear to buffer against the negative effects of cultural stress on emotional and behavioral health, while others appear to exacerbate these effects. Future research could provide a better understanding of these processes.

Conclusion

Adolescence is a time of rapid change and many transitions (Coleman 2011) that can make some adolescents more vulnerable for developing emotional (e.g., depressive symptoms, low self-esteem) and behavioral health (e.g., aggression, substance use) problems (e.g., CDC 2017; Gibson and Miller 2010; Johnston et al. 2015). This might be particularly true for Latinx adolescents, who in addition to normative developmental stressors, can also experience cultural stress (e.g., Cano et al. 2015). Few studies have investigated how neighborhood characteristics may protect or increase Latinx youth risk for developing emotional and behavioral health problems. As such, the present study contributes to the understanding of how positive and negative neighborhood characteristics may buffer, maintain, or exacerbate the negative effects of cultural stress on the emotional and behavioral health of recent immigrant Latinx adolescents and parents. Importantly, this study indicates that for recent immigrant Latinx families, efforts to reduce the negative effects of cultural stress could benefit from combating neighborhood problems (i.e., reducing crime, graffiti, drugs, gangs) and this might be especially beneficial in the early years of immigration. Also, as one of very few studies that have investigated the moderating role of neighborhood characteristics in the effects of parent and adolescent cultural stress on parent and adolescent emotional health outcomes, findings from the present study can guide future research with recent immigrant Latinx adolescents and parents.

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Acknowledgements

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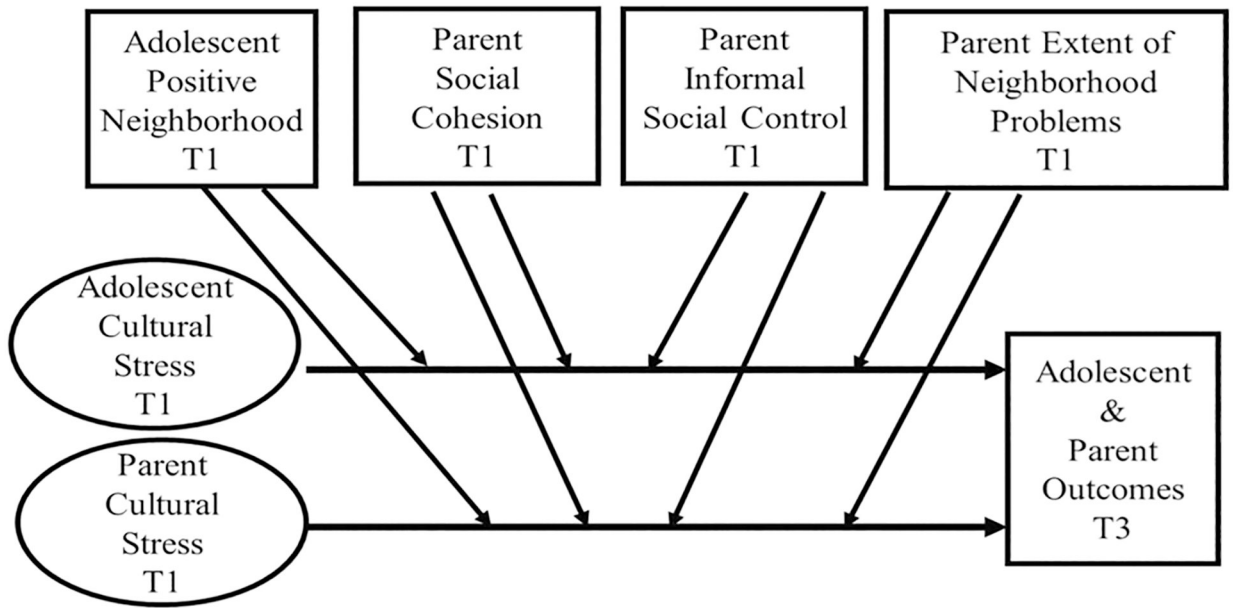
Fig. 1.
Theoretical model
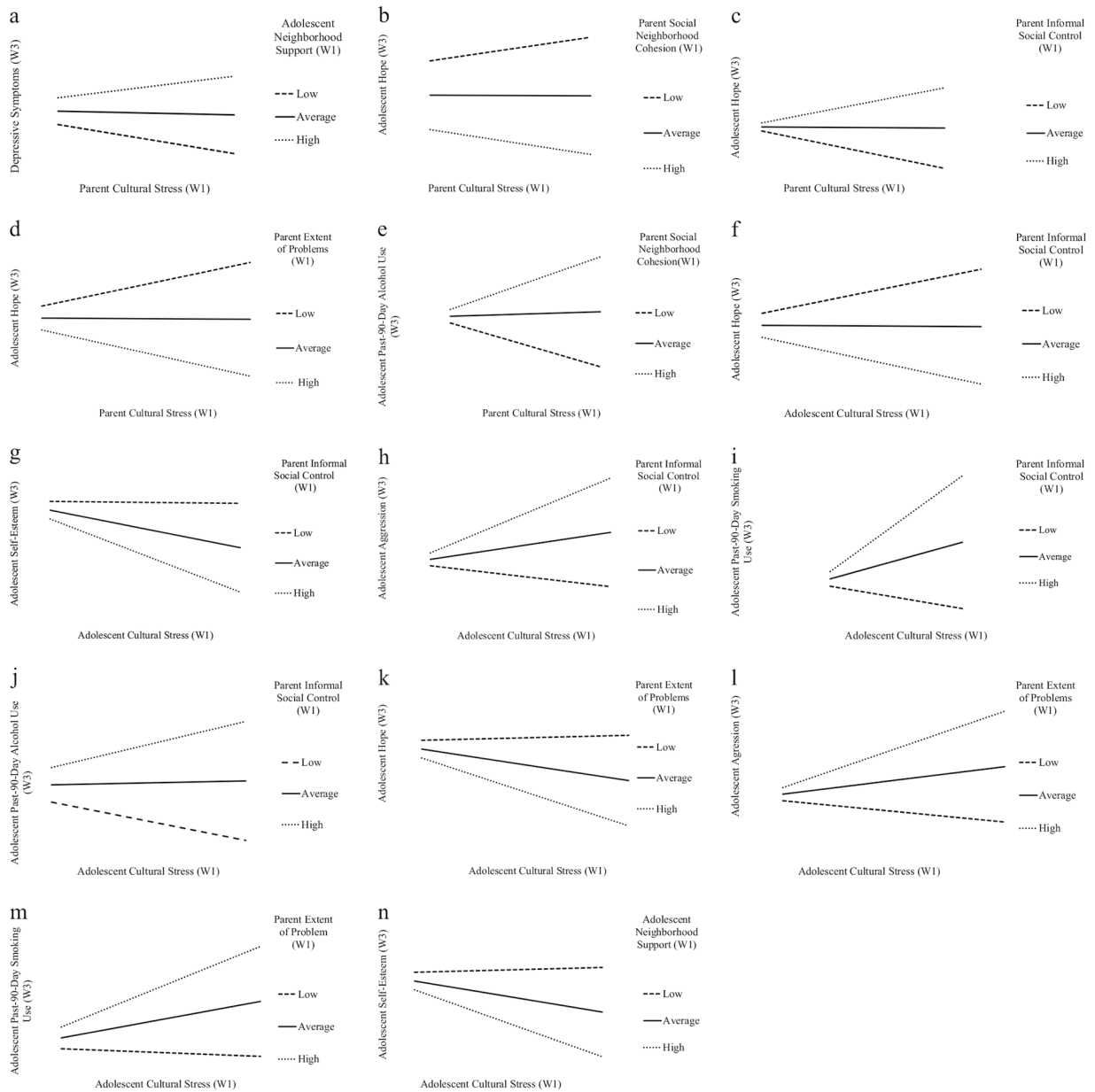
Fig. 2.

a Interaction between parent cultural stress and adolescent perceived neighborhood support predicting adolescent depressive symptoms. **b** Interaction between parent cultural stress and parent perceived social neighborhood cohesion predicting adolescent hope. **c** Interaction between parent cultural stress and parent perceived informal social control predicting adolescent hope. **d** Interaction between parent cultural stress and parent perceived extent of problems predicting adolescent hope. **e** Interaction between parent cultural stress and parent perceived social neighborhood cohesion predicting adolescent alcohol use. **f** Interaction between adolescent cultural stress and parent informal social control predicting adolescent hope. **g** Interaction between adolescent cultural stress and parent informal social control predicting adolescent self-esteem. **h** Interaction between adolescent cultural stress and

parent informal social control predicting adolescent aggressive behavior. **i** Interaction between adolescent cultural stress and parent informal social control predicting adolescent cigarette smoking. **j** Interaction between adolescent cultural stress and parent informal social control predicting adolescent alcohol use. **k** Interaction between adolescent cultural stress and parent extent of problems predicting adolescent hope. **l** Interaction between adolescent cultural stress and parent extent of problems predicting adolescent aggressive behavior. **m** Interaction between adolescent cultural stress and parent extent of problems predicting adolescent cigarette smoking. **n** Interaction between adolescent cultural stress and adolescent perceived neighborhood support predicting adolescent self-esteem

Table 1

Summary statistics for independent and dependent variables

Variable	*N* (%) or *M* (SD)	Range
Cultural stress (P)	7.69 (3.64)	21.00
Cultural stress (A)	10.88 (6.58)	41.00
Social neighborhood cohesion (P)	11.23 (3.89)	20.00
Informal social control (P)	10.49 (3.60)	16.00
Extent of problems (P)	13.42 (6.85)	20.00
Neighborhood support (A)	6.93 (3.28)	12.00
Depressive sx (A)	29.77 (15.94)	74.00
Hope (A)	21.85 (5.42)	24.00
Self-esteem (A)	28.62 (5.26)	24.00
Aggressive behavior (A)	4.89 (5.30)	33.00
Past-90-day smoking (A)	12 (5.00)	-
Past-90-day drinking	20 (6.60)	-
Depressive symptoms (P)	26.21 (11.29)	55.00

Table 2

Bivariate correlations between study variables

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1 Age (A)	1															
2 Gender (A)	−.00	1														
3 Years in the US (A)	−.04	−.03	1													
4 Cultural stress (P)	−.01	−.06	.20*	1												
5 Cultural stress (A)	.07	−.10	.10	.19*	1											
6 Social neighborhood cohesion (P)	.03	−.06	−.08	−.16*	−.03	1										
7 Informal social control (P)	−.02	.05	.16*	.00	−.01	.20*	1									
8 Extent of problems (P)	−.04	.00	−.08	−.22*	−.09	.05	.03	1								
9 Neighborhood support (A)	.07	−.02	−.07	−.11	−.03	.04	.11	.04	1							
10 Depressive symptoms (A)	.06	.05	.09	.02	.30*	−.06	.06	.04	−.10	1						
11 Hope (A)	.03	−.08	−.05	−.04	−.27*	.00	.04	−.01	.17*	−.42*	1					
12 Self-esteem (A)	−.04	−.08	−.06	−.07	−.34*	−.03	−.05	−.06	.08	−.55*	.63*	1				
13 Aggressive behavior (A)	.05	.08	.09	.01	.30*	−.08	.01	.04	−.12	.49*	−.45*	−.45*	1			
14 Past-90-day smoking (A)	.06	.01	.03	−.02	.15**	−.14**	.01	−.06	−.02	.14**	−.14**	−.14**	.31*	1		
15 Past-90-day drinking (A)	.00	.09	.04	.03	.05	−.16**	.02	−.00	−.04	.16**	−.21*	−.16**	.27*	.46*	1	
16 Depressive symptoms (P)	.02	−.12	.05	.19*	.10	.11	−.05	−.10	−.05	.08	−.05	−.07	.09	.01	.02	1

Note: Categorical variables: gender, past-90-day smoking, past-90-day drinking

*
$p < 0.01$

**
$p < 0.05$

Table 3

Direct and interaction effects on health outcomes

Outcomes (T3)	Direct effects (T1)	Estimate	p	Interaction effects	Estimate	p
Depressive Sx (A)	Depressive Sx	.243	.000	CSP × PCOHESION	.093	.139
	CSP	−.047	.348	CSA × PCOHESION	−.025	.565
	CSA	.180	.001	CSP × PCONTROL	−.033	.586
	PCOHESION	−.066	.205	CSA × PCONTROL	.106	.121
	PCONTROL	.097	.096	CSP × ASUPPORT	.163	.009
	PPROBLEM	.085	.175	CSA × ASUPPORT	.043	.364
	ASUPPORT	−.074	.090	CSP × PPROBLEM	−.027	.643
				CSA × PPROBLEM	−.020	.784
Hope (A)	Hope	.271	.000	CSP × PCOHESION	−.148	.003
	CSP	−.007	.906	CSA × PCOHESION	−.090	.102
	CSA	−.241	.000	CSP × PCONTROL	.116	.006
	PCOHESION	−.059	.177	CSA × PCONTROL	−.205	.000
	PCONTROL	.024	.516	CSP × ASUPPORT	.009	.865
	PPROBLEM	−.069	.253	CSA × ASUPPORT	−.027	.764
	ASUPPORT	.128	.041	CSP × PPROBLEM	−.145	.001
				CSA × PPROBLEM	−.147	.002
Self-esteem (A)	Self-esteem	.321	.000	CSP × PCOHESION	−.101	.060
	CSP	−.037	.455	CSA × PCOHESION	.052	.236
	CSA	−.200	.000	CSP × PCONTROL	.092	.119
	PCOHESION	−.048	.421	CSA × PCONTROL	−.089	.047
	PCONTROL	−.047	.406	CSP × ASUPPORT	−.063	.253
	PPROBLEM	−.131	.079	CSA × ASUPPORT	−.148	.011
	ASUPPORT	.031	.629	CSP × PPROBLEM	−.068	.459
				CSA × PPROBLEM	−.100	.063
Aggressive Beh (A)	Aggress. Beh.	.258	.012	CSP × PCOHESION	.012	.872
	CSP	−.070	.177	CSA × PCOHESION	.032	.566
	CSA	.208	.000	CSP × PCONTROL	−.093	.193
	PCOHESION	−.074	.191	CSA × PCONTROL	.173	.000

Outcomes (T3)	Direct effects (T1)	Estimate	p	Interaction effects	Estimate	p
	PCONTROL	.049	.222	CSP × ASUPPORT	.053	.378
	PPROBLEM	.062	.284	CSA × ASUPPORT	.028	.601
	ASUPPORT	−.064	.312	CSP × PPROBLEM	.037	.439
				CSA × PPROBLEM	.133	.020
Past-90-day smoking (A)	CSP	.710	.175	CSP × PCOHESION	1.507	0.080
	CSA	1.821	.000	CSA × PCOHESION	1.037	.827
	PCOHESION	.632	.067	CSP × PCONTROL	1.086	.551
	PCONTROL	1.425	.102	CSA × PCONTROL	1.564	.010
	PPROBLEM	.656	.083	CSP × ASUPPORT	.904	.695
	ASUPPORT	.996	.988	CSA × ASUPPORT	1.073	.590
				CSP × PPROBLEM	1.130	.621
				CSA × PPROBLEM	1.620	.000
Past-90-day drinking (A)	CSP	1.098	.555	CSP × PCOHESION	1.654	.004
	CSA	1.077	.612	CSA × PCOHESION	1.129	.505
	PCOHESION	.649	.031	CSP × PCONTROL	.777	.201
	PCONTROL	1.392	.155	CSA × PCONTROL	1.497	.023
	PPROBLEM	1.107	.581	CSP × ASUPPORT	.957	.828
	ASUPPORT	.951	.853	CSA × ASUPPORT	.830	.349
				CSP × PPROBLEM	1.283	.110
				CSA × PPROBLEM	1.160	.430
Depressive symptoms (P)	Depres. Sx. (P)	.362	.000	CSP × PCOHESION	−.032	.564
	CSP	.049	.467	CSA × PCOHESION	.012	.856
	CSA	.013	.752	CSP × PCONTROL	−.021	.657
	PCOHESION	.123	.032	CSA × PCONTROL	−.047	.334
	PCONTROL	−.081	.161	CSP × ASUPPORT	−.060	.360
	PPROBLEM	−.053	.429	CSA × ASUPPORT	.012	.795
	ASUPPORT	−.042	.166	CSP × PPROBLEM	−.010	.836
				CSA × PPROBLEM	.005	.934

Note: The table shoes standardized path estimates for continuous variables and odds ratios for categorical outcome variables

CSP = parent cultural stress, CSA = adolescent cultural stress, PCOHESION = parent social neighborhood cohesion, PCONTROL = parent informal social control; PPROB = parent extent of problem, ASUPPORT = adolescent supportive neighborhood

Table 4

Probed Interaction effects at the mean and two standard deviations below/above the above the mean

Outcomes T3	Predictor T1	Moderator T1	Interaction term	Low (−2 SD)		Average		High (+2 SD)	
				Estimate	p	Estimate	p	Estimate	p
Depressive symptoms (A)	CSP	ASUPPORT	CSP × ASUPPORT	−.357	.002	−.046	.341	.264	.061
Hope (A)	CSP	PCOHESION	CSP × PCOHESION	.267	.001	−.007	.906	−.280	.038
Hope (A)	CSP	PCONTROL	CSP × PCONTROL	−.220	.027	−.007	.906	.207	.024
Hope (A)	CSP	PPROB	CSP × PPROB	.245	.001	−.007	.906	−.258	.029
Hope (A)	CSA	PCONTROL	CSA × PCONTROL	.190	.067	−.237	.000	−.664	.000
Hope (A)	CSA	PPROB	CSA × PPROB	.038	.705	−.237	.000	−.512	.000
Self esteem (A)	CSA	ASUPPORT	CSA × ASUPPORT	.072	.482	−.196	.000	−.464	.000
Self esteem (A)	CSA	PCONTROL	CSA × PCONTROL	−.010	.911	−.196	.000	−.382	.001
Aggressive behavior (A)	CSA	PCONTROL	CSA × PCONTROL	−.158	.030	.205	.002	.569	.000
Aggressive behavior (A)	CSA	PPROB	CSA × PPROB	−.043	.744	.205	.002	.454	.000
Past-90-day smoking (A)	CSA	PCONTROL	CSA × PCONTROL	.74	.476	1.82	.000	4.45	.000
Past-90-day smoking (A)	CSA	PPROB	CSA × PPROB	.69	.188	1.82	.000	4.78	.000
Past-90-day drinking (A)	CSA	PCONTROL	CSA × PCONTROL	.48	.070	1.08	.611	2.42	.032
Past-90-day drinking (A)	CSP	PCOHESION	CSP × PCOHESION	.40	.034	1.10	.559	3.00	.006

Note: The table shows standardized path estimates for continuous variables and odds ratios for categorical outcome variables

CSP = parent cultural stress, CSA = adolescent cultural stress, PCOHESION = parent social neighborhood cohesion, PCONTROL = parent informal social control; PPROB = parent extent of problem, ASUPPORT = adolescent neighborhood support

Table 5

Significant probed interaction effects on outcomes

CSP	CSA	ASUPPORT	PCOHESION	PCONTROL	PPROB	Outcome	Expected findings	Unexpected findings
X		Low				Lower depressive sx (A)		X
	X	High				Lower self-esteem (A)		X
X			Low			Higher hope (A)		X
X			Low			Lower alcohol use (A)		X
X			High			Lower hope (A)		X
X			High			Higher alcohol use (A)		X
X				Low		Lower hope (A)	X	
	X			Low		Lower aggressive behavior (A)		X
	X			Low		Lower alcohol use (A)		X
X				High		Higher hope (A)	X	
	X			High		Lower hope (A)		X
	X			High		Lower self-esteem (A)		X
	X			High		Higher aggressive behavior (A)		X
	X			High		Higher cigarette smoking (A)		X
	X			High		Higher alcohol use (A)		X
X					Low	Higher hope (A)	X	
	X				Low	Higher hope (A)	X	
	X				High	Lower hope (A)	X	
X					High	Lower hope (A)	X	
	X				High	Higher aggressive behavior (A)	X	
	X				High	Higher cigarette smoking (A)	X	

Note: The table shows significant probed interaction effects and provides information about which effects were expected and unexpected

CSP = parent cultural stress, CSA = adolescent cultural stress, PCOHESION = parent social neighborhood cohesion, PCONTROL = parent informal social control; PPROB = parent extent of problem, ASUPPORT = adolescent neighborhood support