Neighborhood Influences on Behavior Problems among Low-Income, Mexican American Children

by

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ABSTRACT

Latino children are more than twice as likely to live in poverty than their non-Latino, White peers (Kids Count Data Center, 2017), yet limited work has aimed to understand neighborhood influences on pathways of mental health among Latino children. Substantial work documents the deleterious effects of living in a disadvantaged neighborhood on mental health outcomes throughout the lifespan (Leventhal & Brooks-Gunn, 2000). Parental and familial variables may explain neighborhood influences on children's mental health during the first few years of life (May, Azar, & Matthews, 2018). The current study evaluated the influence of three neighborhood indicators (concentrated disadvantage, residential instability, and the percentage of residents identifying as Hispanic/Latino) on maternal postpartum depressive symptoms and child behavior problems at 3 and 4.5 years via mediation and moderated mediation models among a sample of 322 low-income, Mexican American mother-child dyads. Contrary to hypotheses and existing literature, concentrated disadvantage and residential instability were not predictive of maternal or child mental health outcomes. The percentage of residents identifying as Hispanic/Latino emerged as a protective neighborhood factor for both mothers and children. The neighborhood ethnocultural context may be especially relevant to understanding pathways of mental health specific to Mexican American families. More research is needed to understand specific parental and familial mechanisms underlying this protective effect.

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INTRODUCTION

As early as the preschool period, Latino children exhibit a higher prevalence of internalizing and externalizing problems (Isasi, Rastogi, & Molina, 2016; Lavigne et al., 1996). Additionally, Latino children experience higher rates of unmet need for mental health care (having a need for mental health evaluation but not using services in a 1-year period) compared to their non-Latino white peers, further perpetuating discrepancies in mental health problems (Kataoka, Zhang, & Wells, 2002). Traditional models of the development of early-onset internalizing and externalizing problems often stop at the child- and family-level contexts. However, Bronfenbrenner's seminal approach to child development, ecological systems theory, extends an individual's environmental context beyond the family (Bronfenbrenner, 1977). Greater societal and cultural systems also have the potential to greatly influence a child's immediate context and subsequent development throughout the lifespan (Bronfenbrenner, 1977). Recently, researchers have aimed to better understand contexts beyond the familial environment, implicating the neighborhood as another important context contributing to an individual's mental health. Disadvantaged neighborhoods are commonly identified as an impactful context increasing a child's risk of developing a variety of maladaptive behavioral and emotional outcomes.

Understanding the neighborhood context of mental health problems is important for several reasons. Neighborhood residents and nonresidents may ignore the environmental context of an adverse neighborhood, and therefore blame the residents themselves for elevated rates of mental health problems. However, from a public health

perspective, it is more efficient to deal with mental health on a community, neighborhood level, rather than solely at the individual level (Cutrona, Wallace, & Wesner, 2006). Additionally, the study of neighborhoods has the potential to provide insight into existing socioeconomic, racial, and ethnic disparities in mental health and help reveal why these disparities exist. Latino children are more likely to live in poor neighborhoods than their non-minority peers (Spencer, 1990; Kids Count Data Center, 2017). According to the U.S. Census Bureau's 2016 American Community Survey, 28% of Latino children lived in poverty, compared to 12% of non-Latino white children (Kids Count Data Center, 2017). Perhaps, differential rates of exposure to various neighborhood contexts are a contributor to these early discrepancies.

Three broader models have been proposed to explain neighborhood-related mental health outcomes: the structural characteristics model, the neighborhood disorder model, and the environmental stress model (Wandersman & Nation, 1998). The *structural characteristics* approach to neighborhoods studies census-based neighborhood characteristics related to prevalence of mental health problems, often examining the causal pathways through which these neighborhood mechanisms operate (Wandersman & Nation, 1998). A neighborhood's structural factors include the collective sociodemographic characteristics of its residents (i.e. poverty status, educational attainment, unemployment, racial/ethnic characteristics, etc.) (Freisthler & Maguire-Jack, 2015). These structural factors are simply descriptive characteristics of a neighborhood's makeup. The *neighborhood disorder* model emphasizes the contributions of physical and social signs of neighborhood decline (i.e. abandoned buildings or street harassment) to

feelings of safety and mental health (Wandersman & Nation, 1998). The *environmental stress* approach studies environmental stressors, or aspects of the ambient and built environment (i.e. pollution or crowding), in relation to mental health outcomes (Wandersman & Nation, 1998).

The current study takes a *structural characteristics* approach to understanding the impact of neighborhoods on mental health outcomes. Researchers have used a variety of structural neighborhood characteristics to understand neighborhood influences on mental health. Concentrated disadvantage, an indicator of a community's broader socioeconomic status, is the most frequently implicated structural characteristic in the neighborhood literature. Sampson et al.'s (1997) commonly used approach conceptualizes concentrated disadvantage as the composite of six census-level metrics: percentage of residents below the poverty line, percentage of residents on public assistance, percentage of female-headed households, percentage of residents unemployed, percentage of residents less than 18, and percentage of African American residents. Originally included as a proxy measure of segregation, the appropriateness of including the percentage of African American residents in the composite has been questioned, and more recent calculations of concentrated disadvantage do not include it (Stampfel, 2013). Concentrated disadvantage is thought to be a better indicator of neighborhood socioeconomic status than the individual metrics themselves, by capturing the synergistic influences of a variety of characteristics in a disadvantaged neighborhood (Stampfel, 2013).

Residential instability, another structural characteristic, is a commonly used indicator of a neighborhood's social makeup. According to social disorganization theory,

high levels of concentrated disadvantage and residential instability contribute to a socially disorganized neighborhood, in which neighbors are not strongly tied to each other and there is little collective efficacy (Sampson & Groves, 1989; Sampson, Morenoff, & Gannon-Rowley, 2002). Residential instability can be conceptualized as a proxy measure of a neighborhood's social climate, or the likelihood and types of interactions between residents. Residential instability captures the degree to which individuals are moving in and out of the neighborhood by taking into account the percentage of residents renting property (instead of owning) and the percentage of residents who have moved in the last 5 years. Sampson et al. (1997) posits that the formation of social ties within one's neighborhood takes time. Stronger social ties with neighbors promote better mental health by offering residents a sense of social support outside of the familial environment and a sense of autonomy in the creation of their situational environment. Neighborhoods with high residential instability may be perpetuating the existing stressors contributing to residents' poorer mental health.

Although neighborhood research tends to focus on the risk associated with various disadvantageous neighborhood characteristics, potentially protective aspects of cultural or ethnic neighborhood contexts are also worthy of consideration. For example, ethnic minority groups, despite living in disadvantaged neighborhoods at a higher rate, may possess a shared cultural identity or set of values contributing to increased neighborhood social cohesion (Rios, Aiken, & Zautra, 2012). Living in an *ethnic enclave*, a neighborhood in which the majority population identifies as the same ethnic minority group, may be associated with increased social ties and subsequently greater collective

efficacy and better mental health (Vega, Ang, Rodriguez, & Finch, 2011). For example, *familismo*, a traditional Mexican American cultural value that emphasizes social ties with one's immediate and extended family and putting the family before oneself, has been found to be protective against individual mental health problems (Campos, Ullman, Aguilera, & Dunkel Schetter, 2014). Living in a neighborhood in which *familismo* is a commonly shared value may be similarly protective on a broader, community level (Gonzales et al., 2011). Perhaps, the shared values and norms of communities with a higher percentage of Latino residents counteract the traditional association between neighborhood concentrated disadvantage and poorer mental health. Gaining a better understanding of the protective aspects of disadvantaged neighborhoods may help illuminate potential areas for neighborhood-level prevention and intervention efforts targeting community mental health, especially in the context of ethnic minority groups.

Depression is the most commonly implicated mental health outcome in neighborhood-level research across all age groups (Roux & Mair, 2010). In a review of 45 studies, 37 found an association between neighborhood characteristics and residents' depressive symptoms (Mair, Roux, & Galea, 2008). Stress plays a fundamental role in theories associating neighborhood characteristics with depression. Cutrona et al. (2006) proposes three pathways for understanding how disadvantaged neighborhoods affect depression: (1) level of daily stress, (2) vulnerability to negative events, and (3) disrupted social ties. Disadvantaged neighborhoods may contribute to an individual's daily stress through the physical features of the neighborhood and fear of victimization by other residents. Residents of disadvantaged neighborhoods are more likely to develop

depression in response to negative life events than those living in more advantaged neighborhoods, perhaps as a result of limited resources, the absence of role models, and communal norms promoting ineffective coping strategies (Cutrona et al., 2006). Conversely, neighborhood characteristics affect how residents associate with and support one another (Sampson et al., 2002), potentially offering opportunities through which residents can serve as a protective factor against developing mental health problems.

Prior research demonstrates the importance of the neighborhood context in understanding mental health, but much remains to be learned. A majority of existing research focuses on adults, adolescents, or older children. Little is known about how the neighborhood context influences children's mental health, especially during the earliest years of life. Considering neighborhood effects on young children's mental health might seem counterintuitive given limited exposure to and interaction with their neighborhoods. Additionally, children might possess limited understanding of the characteristics of their neighborhood. However, preliminary evidence suggests that neighborhood effects may be even stronger for children, compared to adults (Mair et al., 2008), perhaps due to the developing brain and body's elevated susceptibility to influence from environmental contexts (Shonkoff, Phillips, & National Research Council, 2000; Evans, 2006). Neighborhood effects, specifically differences between neighborhoods, have been suggested to account for a substantial proportion of variance in children's mental health problems (Xue et al., 2005). Understanding the neighborhood factors influencing childhood mental health will help elucidate why low-income and ethnic minority children

are more susceptible to developing psychopathology in childhood and throughout subsequent development.

Studies with older children and adolescents suggest that neighborhoods can have a critical influence across a variety of domains, including the development of behavioral and emotional problems, problem drinking, drug use, and involvement in criminal activity (Aneshensel & Sucoff, 1996; Leventhal & Brooks-Gunn, 2000). Research with younger children suggests neighborhoods to influence a variety of outcomes related to school readiness and behavioral and emotional problems in the first few years of life (Leventhal & Brooks-Gunn, 2000). Lower neighborhood SES has been linked to lower scores on developmental tests as early as age 3 (Klebanov, Brooks-Gunn, McCarton, & McCormick, 1998). Among children ages 5 to 6, high neighborhood SES was associated with higher IQ, verbal ability, and reading achievement scores (Chase-Lansdale & Gordon, 1996; Leventhal & Brooks-Gunn, 2000).

Despite increased neighborhood-level understanding of academic outcomes, limited research has focused on neighborhood influences in relation to the development of internalizing and externalizing mental health problems in young children. In a sample of 3-year-olds, living in a neighborhood with fewer managerial or professional employees was associated with more internalizing and externalizing problems (Brooks-Gunn, Duncan, Klebanov, & Sealand, 1993). In a more recent study, Xue and colleagues (2005) examined the effects of structural neighborhood characteristics (concentrated disadvantage, immigrant concentration, and residential stability) on internalizing outcomes in 5- to 11-year-old children. Direct effects of neighborhoods on internalizing

problems were found, even after accounting for a variety of family and individual risk factors (including maternal depression and prior childhood mental health scores), underscoring the importance of studying neighborhood influences on childhood mental health.

Another gap in the literature is an understanding of the mechanisms underlying neighborhood influences on child mental health. As suggested earlier, it may not be obvious why neighborhood influences would have an impact on early childhood mental health, given children's limited direct interaction with their neighborhoods. However, young children interact frequently with their parents, who interact frequently with the neighborhood (Kohen, Leventhal, Dahinten, & McIntosh, 2008; Villanueva et al., 2016). Indirect neighborhood effects on child mental health are commonly understood through a family stress model, in which stressors external to the family environment lead to parental mental health problems, increasing the likelihood of maladaptive parenting behaviors, and subsequently negatively impacting child development (White, Liu, Nair, & Tein, 2015). Despite substantial direct interaction with the neighborhood during adolescence, the familial context has still been demonstrated to mediate the relationship between neighborhood influences and adolescent mental health (White & Roosa, 2012). May et al. (2018) conceptualize maternal and familial variables as the means through which "neighborhood context 'comes through the door'" and influences young children. Maternal perception of neighborhood has been shown to influence how mothers interact with their children (Dahl, Ceballo, & Huerta, 2010), suggesting neighborhood-related stress to alter mother-child interactions. For example, living in a disadvantaged

neighborhood with little external social support may cause a single mother to feel additionally taxed in her interactions with her child.

The current study proposes maternal postpartum depression (PPD) as a family-level mediator of the relationship between the neighborhood context and child mental health. The effects of maternal depression on child maladjustment, especially child behavior problems, are well documented and vast (Goodman et al., 2011). Earlier exposure to maternal depression is especially harmful for children, underscoring the importance of studying maternal depression during the postpartum period (Goodman & Gotlib, 1999). Children of depressed mothers are predisposed to develop internalizing and externalizing problems at a higher rate by middle childhood (Goodman et al., 2011), due to a combination of genetic, biological, and environmental influences. In the Xue et al. (2005) study, maternal depression had significant influences on child internalizing symptoms across all neighborhood contexts. Similarly, in a sample of low-income African American preschoolers living in disadvantaged neighborhoods, lower levels of maternal depressive symptoms predicted lower levels of childhood internalizing and externalizing problems (Koblinsky, Kuvalanka, & Randolph, 2006). Kohen et al. (2008) found neighborhood structural disadvantage to be associated with lower neighborhood social cohesion and higher rates of maternal depression, implicating the importance of understanding maternal depression within the neighborhood context. Additional research on the intergenerational transmission of mental health problems is especially needed in the context of disadvantaged neighborhoods. The added environmental stress of a disadvantaged neighborhood may increase the likelihood of this transmission.

The postpartum period is a particularly compelling period during which to consider neighborhood influences on maternal depressive symptoms. Although postpartum depression affects women from all demographics, higher rates of postpartum depression have been documented in women of ethnic minority groups (Rich-Edwards et al., 2006). Perhaps, the arrival of a new baby increases maternal awareness of salient neighborhood characteristics, especially in the context of disadvantaged neighborhoods. An evolutionary perspective on a variety of empirically documented behaviors during pregnancy, including nesting, disease pathogen avoidance, odor preference, and in-group preference, suggests the arrival of a new baby to be a period during which mothers are innately more aware of their environment and its potential threats (Hahn-Holbrook, Holbrook, & Haselton, 2011). In a disadvantaged neighborhood, an increased awareness of the negative aspects of the neighborhood context may especially increase maternal stress and subsequent depressive symptoms during the postpartum period.

Studying neighborhood influences on childhood mental health, specifically, has the potential to illuminate when socioeconomic, ethnic, and racial disparities are first evident. Methodologically, the vast majority of research on neighborhood influences on mental health is cross-sectional (Mair et al., 2008); existing longitudinal studies in this area of research rarely extend beyond 1-2 years. A prospective, longitudinal approach to studying neighborhood influences on early childhood mental health is essential in discerning when and how neighborhood characteristics first affect child mental health. Residents of disadvantaged neighborhoods often live in these environments for the duration of their childhood (Quillian, 2003), setting the stage for potential cumulative

effects (Wodtke, Harding, & Elwert, 2011). Even so, individuals who experienced poverty during preschool and early school years have lower rates of school completion than those who experienced poverty during later developmental periods (Brooks-Gunn & Duncan, 1997), suggesting neighborhood influences during the first few years of life may be the most impactful for subsequent development.

A final gap in the research on neighborhoods involves their unique influences on ethnic minority groups, specifically children of Hispanic/Latino ethnicity. The majority of neighborhood research on children's mental health involves samples of European American or African American families (White & Roosa, 2012). As discussed previously, evidence suggests disparities in mental health are already evident as early as the preschool period, with Latino children exhibiting a higher prevalence of internalizing and externalizing problems (Isasi, Rastogi, & Molina, 2016; Lavigne et al., 1996). In the context of neighborhood research, it is especially important to understand neighborhood influences on childhood mental health outcomes given a Latino family's higher risk of living in a disadvantaged neighborhood.

Current Study

The current study aimed to extend existing literature on neighborhood influences on children's mental health by investigating three structural neighborhood characteristics (concentrated disadvantage, residential instability, and percentage of residents identifying as Hispanic/Latino) and their influence on behavior problems (total internalizing and externalizing problems) in children at 3 and 4.5 years of age. By investigating these phenomena in a sample of low-income Mexican American mothers and children, this

study aimed to provide insight on neighborhood influences on mental health in Latino children, an underrepresented group in the existing literature.

The second aim was to understand the role of maternal PPD symptoms as a potential mediator of the impact of structural neighborhood characteristics on child behavior problems (see Figure 1). A final aim was to elucidate when neighborhood influences on mental health are first apparent during childhood. Very few studies have explored neighborhood influences on mental health in children before the age of 5. Identifying when early neighborhood influences are first evident will better inform which developmental timepoints are most critical for effective prevention or intervention.

I evaluated two models of neighborhood influence on maternal PPD symptoms and child behavior problems; one tested the direct effects of concentrated disadvantage and residential instability (see Figure 1) and one tested a moderated effect of the percentage of residents identifying as Hispanic/Latino (see Figure 2). I hypothesized that neighborhood concentrated disadvantage and neighborhood residential instability would be associated with higher maternal PPD symptoms across the first six months after birth and predict more child behavior problems at 3 and 4.5 years of age. A greater percentage of individuals in a neighborhood identifying as Hispanic/Latino was expected to moderate the impact of neighborhood concentrated disadvantage and residential instability on maternal PPD symptoms across the first six months (see Figure 3). I hypothesized that high levels of concentrated disadvantage and residential instability would be more strongly associated with PPD symptoms among women who live in neighborhoods with a lower percentage of Hispanic/Latino residents. Further, I

hypothesized that maternal PPD symptoms across the first six months would mediate the relation between structural neighborhood characteristics and child behavior problems at 3 and 4.5 years of age.

METHODS

Participants

The sample included 322 mother-child dyads participating in the *Las Madres Nuevas* study of low-income, Mexican American mothers and their children. Women were recruited from a hospital-based, community prenatal clinic. Eligibility criteria included: (1) self-identification as Mexican or Mexican American, (2) English or Spanish fluency, (3) at least 18 years of age, (4) low-income status (defined as family income below $25,000 or eligibility for Medicaid or Federal Emergency Services coverage for the childbirth), and (5) anticipated delivery of a singleton birth with no prenatal evidence of health or developmental problems.

At the time of enrollment, women were between 18 and 42 years of age (M = 27.8) and had completed, on average, 10 years of education. The majority of women were born in Mexico (86.0%), spoke Spanish as their primary language (82.0%), and were unemployed (83.5%). On average, women had lived in the United States for approximately 12 years (range 0-32). The modal family income was $10,001 - $15,000 for an average household of four people. Most women were unmarried but living with a romantic partner (45.7%). Most women were not first-time mothers (77.8%); of those women, the number of other biological children ranged from one to nine.

Procedures

Data for the current analyses were collected at a prenatal home-visit, postpartum home visits at 6, 12, 18, and 24 weeks, phone calls at 9, 15, and 21 weeks, and laboratory visits when children were 3 and 4.5 years of age. During a prenatal care appointment, women were approached by a bilingual interviewer who explained the study and evaluated eligibility. The interviewer obtained informed consent at the prenatal visit in the women's homes between 26-38 weeks gestation. The prenatal interview and the postpartum interviews were conducted in participants' homes and lasted approximately 2 hours. Telephone assessments lasted approximately 10 minutes. Interviews were conducted in participants' choice of Spanish (85%) or English (15%). Survey questions were read aloud to all participants given variability in literacy. Participants were also given visual aids with written and graphic descriptions of item response formats. At the prenatal and 6-week, 12-week, 18-week, and 24-week postpartum interviews, participants were compensated $50 and small gifts for the baby (e.g. rattles, bibs). Participants were compensated $10 for each phone interview.

The 36-month and 54-month visits were conducted in the laboratory at Arizona State University. At these visits, mothers completed several questionnaires and interaction tasks with their children. Children also participated in several self-regulation tasks and a variety of other assessments of executive functioning, vocabulary skills, comprehension, etc. Participants were compensated $100, and up to $50 for travel expenses, for each laboratory visit.

Attrition

The study employed a "planned missingness" design in order to minimize participant burden and promote retention. The entire sample completed the prenatal and 6-week visits, but participants were randomly assigned to miss either the 12-, 18-, or 24-week postpartum visit. Of the 322 women who consented at the prenatal visit, 312 (97%) completed the 6-week visit, 307 (95%) completed the 9-week phone call, 203 (99% of those randomly assigned) completed the 12-week visit, 302 (94%) completed the 15-week phone call, 209 (96% of those randomly assigned) completed the 18-week visit, 299 (94%) completed the 21-week phone call, and 209 (93% of those randomly assigned) completed the 24-week visit. Two hundred sixteen (67%) completed the 3-year lab visit and 230 (71%) completed the 4.5-year lab visit.

Measures

Neighborhood structural characteristics. Neighborhood structural characteristics were gathered using data from the 2010 U.S. Census and 2012 American Community Survey (ACS; U.S. Census Bureau, 2011). Census tract information for each participant was compiled using addresses at the time of the prenatal visit (26-38 weeks gestation), ranging from 2010-2012. Although census tracts are the most common neighborhood unit in research, some researchers have used smaller units to classify a neighborhood, such as block groups or face blocks. Sampson et al. (2002) suggests that neighborhood influences on mental health do not depend largely on the unit of neighborhood measurement used. Therefore, in the context of this study, a participant's census tract was considered the neighborhood in which they live.

Neighborhood concentrated disadvantage was calculated as a commonly used composite of various standardized census-level metrics: percentage of residents living below the poverty line, percentage of residents on public assistance, percentage of female-headed households, percentage of unemployed residents, and percentage of residents under the age of 18 years (Sampson et al., 1997). Neighborhood residential instability was calculated as the composite of two standardized census-level metrics: the percentage of renter-occupied residences and the percentage of residents who have moved in the 5 years prior. Percentage of residents identifying as Hispanic/Latino was retrieved directly from the American Community Survey.

Maternal postpartum depressive symptoms. The Edinburgh Postnatal Depression Scale (EPDS; Cox, Holden, & Sagovsky, 1987) was administered at each home and phone interview from 6 weeks to 6 months (at 6, 9, 12, 15, 18, 21, and 24 weeks). The EPDS is a 10-item measure of perinatal depressive symptoms experienced in the last week. Each answer is given a score from 0 to 3, with higher scores indicating more severe depressive symptoms. The EPDS has been validated in both English and Spanish (Garcia-Esteve, Escaso, Ojuel, & Navarro, 2003). Cronbach's alpha ranged from .817 to .868 across the seven measurement timepoints.

To capture maternal depression across the postpartum period, depressive symptoms from 6 weeks to 6 months were calculated as area under the curve with respect to ground (AUCg). An AUCg calculation of symptoms is advantageous over other measures of maternal PPD symptoms, such as average or total symptoms, by capturing

the overall extent of symptoms across multiple time points throughout the entire postpartum period (Pruessner, Kirschbaum, Meinlschmid, & Hellhammer, 2003).

Child behavior problems. At the 3- and 4.5-year lab visits, children's internalizing and externalizing problems were assessed via maternal report using the Child Behavior Checklist (CBCL/1.5-5; Achenbach, 2001). The CBCL is a 113-item measure of children's internalizing, externalizing, and total behavior problems. Total behavior problems include internalizing behaviors, externalizing behaviors, sleep and other problems. Respondents rate each behavior on a 3-point scale (*not true*, *somewhat or sometimes true*, and *very true or often true*); each behavior is rated as it occurs now or within the past two months. Scale scores are created by summing individual item responses corresponding to the scales. The CBCL has been validated in both English and Spanish (Rubio-Stipec, Bird, Canino, & Gould, 1990). This study used the composite of total problem behaviors, including both internalizing and externalizing problems, as a measure of child behavior problems. Internal consistency at 3 years, Cronbach's alpha = .955, and 4.5 years, Cronbach's alpha = .954, was good.

Potential covariates. Child gender and date of birth, birth outcomes, maternal age, and maternal country of birth were obtained at the prenatal visit or through medical record review at the hospital of birth. These variables were evaluated as potential covariates. Variables with a statistically significant relation to primary study variables were included in final statistical models.

Data Analysis

Missing data. Of the 322 cases, 107 (33.2%) and 92 (28.6%) were missing on the measure of child behavior problems at 3 and 4.5 years respectively. Mothers with missing data on child behavior problems at 3 years were more likely to be younger at the prenatal visit, $t(319) = 2.70$, $p = .007$. Participants with missing data on child behavior problems at 4.5 years did not differ from those without missing data. All primary analyses were conducted with Mplus v. 8 (Muthen & Muthen, 1998-2017), which uses all available values and maximum likelihood estimation for cases with missing data. This approach has been considered superior to pairwise or listwise deletion (Enders & Bandalos, 2001).

Outliers on primary study variables. Potential outliers were identified by standardizing primary study variables. Cases more than 3 standard deviations from the mean on any primary study variable were identified as potential outliers. No potential outliers were identified on concentrated disadvantage, residential instability, or percentage residents identifying as Hispanic/Latino. One case was identified as a potential outlier on maternal PPD symptoms (AUCg). Two cases were identified as potential outliers on child behavior problems at 3 years. Two separate cases were identified as potential outliers on child behavior problems at 4.5 years. One case was identified as a potential neighborhood outlier based on the number of residents in the census tract. The pattern of results did not change when these cases were excluded from analyses; therefore, they were included in all analyses presented here.

Preliminary analyses. Preliminary analyses included descriptive statistics for primary study variables and unstandardized neighborhood characteristic variables, in

order to construct the concentrated disadvantage and residential instability composites. Correlations between primary study variables were also calculated.

Despite 322 participants in the sample, there were only 152 unique census tracts. The intraclass correlation coefficient (ICC) and design effect (DEFF) were calculated for each dependent variable (maternal PPD symptoms, child behavior problems at 3 years, and child behavior problems at 4.5 years) based on census tract to determine whether clustering was affecting the significance of primary findings.

Primary analyses. Primary analyses tested four sets of models of neighborhood characteristics to child behavior problems at 3 and 4.5 years. The first set of models tested the direct effect of each individual neighborhood characteristic on child behavior problems at 3 and 4.5 years, including covariates. The second set of models tested the direct effects of neighborhood characteristics on child behavior problems at 3 and 4.5 years. The third set of models included mediation models testing neighborhood concentrated disadvantage and residential instability on child behavior problems at 3 and 4.5 years as mediated through maternal PPD symptoms across the first six months. Single mediator models were evaluated using multiple regression analysis (Mackinnon, 2008) to evaluate the statistical significance of the indirect path parameters and direct path parameter. The fourth set of models included moderated mediation models evaluating the moderation of the effect of concentrated disadvantage and residential instability on maternal PPD symptoms by percentage residents identifying as Hispanic/Latino. Mediation models were tested by examining the statistical significance of the indirect effect using 2000 bootstrap confidence intervals, which has been demonstrated to be a

better statistical test of mediation than using p-values (Mackinnon, 2008; Mackinnon, Lockwood, & Williams, 2004). If the 95% confidence interval does not include zero, the path is statistically significant.

Two sets of analyses were conducted for the second, third, and fourth set of models. The first set of analyses (i.e., the base models) included primary study variables, but excluded covariates. The second set of analyses included covariates identified during preliminary analyses.

RESULTS

Preliminary results.

Descriptive statistics. Table 1 presents descriptive statistics for the unstandardized neighborhood characteristic variables entering the concentrated disadvantage and residential instability composites. Table 2 and Table 3 present zero-order correlations for the standardized neighborhood characteristic variables entering each composite. Table 4 presents descriptive statistics for primary study variables. Table 5 presents zero-order correlations for primary study variables.

Several potential covariates (maternal age at prenatal visit, maternal country of birth, number of other biological children) were correlated with primary study variables. Maternal age was correlated with maternal PPD symptoms, $r = .121$, $p = .030$, and with child behavior problems at 3 years, $r = -.181$, $p = .008$. Maternal country of birth was correlated with child behavior problems at 3 years, $r = -.231$, $p = .001$, and with child behavior problems at 4.5 years, $r = -.183$, $p = .005$: Mothers who were born in the United

States reported more child behavior problems. Mothers with more biological children reported fewer child behavior problems at 3 years, r = -.141, p = .040.

Concentrated disadvantage was positively correlated with residential instability, r = .178, p = .001, and with the percentage of residents identifying as Hispanic/Latino, r = .674, p < .001. Maternal PPD symptoms were positively correlated with child behavior problems at 3 years, r = .161, p = .018, and with child behavior problems at 4.5 years, r = .282, p < .001. The percentage of residents identifying as Hispanic/Latino was negatively correlated with maternal PPD symptoms, r = -.146, p = .009, and with child behavior problems at 4.5 years, r = -.171, p = .010.

Based on 95% confidence intervals, the ICC estimates were 0.21 for maternal PPD symptoms, 0.02 for child behavior problems at 3 years, and 0.28 for child behavior problems at 4.5 years. Typically, ICC values of .10 are considered high enough to account for clustering (Hox, 1998). A better test for clustering effects in non-multilevel analyses is the design effect. The DEFF estimates were 1.09 for maternal PPD symptoms, 1.01 for child behavior problems at 3 years, and 1.12 for child behavior problems at 4.5 years. DEFF values below 1.4 are considered acceptable to model without adjusting for clustering (Muthen & Satorra, 1995; Lai & Kwonk, 2015).

Primary results.

Table 6, Table 7, and Table 8 present the direct effects of individual neighborhood characteristics on child behavior problems at 3 and 4.5 years, adjusting for covariates (maternal age at prenatal visit, maternal country of birth, number of other

biological children). The direct effect of concentrated disadvantage on child behavior problems was not statistically significant at 3 years (p = .40) or 4.5 years (p = .08). The direct effect of residential instability on child behavior problems was not statistically significant at 3 years (p = .68) or 4.5 years (p =.70). The direct effect of percentage residents Hispanic/Latino on child behavior problems was not statistically significant at 3 years (p = .77). The direct effect of percentage residents Hispanic/Latino on child behavior problems at 4.5 years was statistically significant (Est = -0.189, SE Est = 0.069, p = .006).

Tables 9 and 10 present the base models predicting the direct effects of neighborhood characteristics on child behavior problems, without the mediated effect of maternal PPD symptoms. Concentrated disadvantage was a significant predictor of child behavior problems at 3 years (Est = 5.153, SE Est = 2.537, p = .042). Percentage residents Hispanic/Latino was a significant predictor of child behavior problems at 4.5 years (Est = -0.237, SE Est = 0.090, p = .009). After controlling for covariates, concentrated disadvantage was no longer a significant predictor of child behavior problems at 3 years (p = .12). Percentage residents Hispanic/Latino remained a significant predictor of child behavior problems at 4.5 years (Est = -0.201, SE Est = 0.089, p = .023).

Tables 11 and 12 present the base models predicting the direct effects of neighborhood characteristics, including interactions terms, on child behavior problems, without the mediated effect of maternal PPD symptoms. The interaction of concentrated disadvantage and percentage residents Hispanic/Latino was not a statistically significant

predictor of child behavior problems at 3 years (p = .88) or 4.5 years (p = .35). The interaction of residential instability and percentage residents Hispanic/Latino was not statistically significant predictor of child behavior problems at 3 years (p = .47) or 4.5 years (p = .18).

Mediation models predicting child behavior problems. Table 13 presents the set of models predicting child behavior problems at 3 and 4.5 years from concentrated disadvantage and residential instability mediated through maternal PPD symptoms, without covariates included. Concentrated disadvantage (p = .10) and residential instability (p = .96) were not statistically significant predictors of maternal PPD symptoms. Child behavior problems at 3 years were significantly predicted by maternal PPD symptoms, Est = 0.188, SE Est = 0.070, 95% CI: [0.056, 0.305], p = .007. The sum of the indirect effects from concentrated disadvantage to child behavior problems at 3 years via maternal PPD symptoms was not statistically significant, 95% bootstrap CI: [-1.433, 0.111]. The sum of the indirect effects from residential instability to child behavior problems at 3 years via maternal PPD symptoms was not statistically significant, 95% bootstrap CI: [-0.711, 0.597]. Child behavior problems at 4.5 years were significantly predicted by maternal PPD symptoms, Est = 0.290, SE Est = 0.067, 95% CI: [0.163, 0.424], p < .001. The sum of the indirect effects from concentrated disadvantage to child behavior problems at 4.5 years via maternal PPD symptoms was not statistically significant, 95% bootstrap CI: [-2.049, 0.156]. The sum of the indirect effect from residential instability to child behavior problems at 4.5 years via maternal PPD symptoms was not statistically significant, 95% bootstrap CI: [-0.970, 0.955].

Table 14 presents the set of mediation models predicting child behavior problems at 3 and 4.5 years, adjusting for covariates (maternal country of birth, maternal age at prenatal visit, number of other biological children). Child behavior problems at 3 years was predicted by maternal depressive symptoms, Est = 0.182, SE Est = 0.073, 95% CI: [0.044, 0.355]**,** p = .010, and maternal country of birth, Est = -12.504, SE Est = 5.609, 95% CI: [-23.988, -1.932], p = .026. Child behavior problems at 4.5 years was similarly predicted by maternal depressive symptoms, Est = 0.281, SE Est = 0.069, 95% CI: [0.150, 0.420], $p < .001$, and maternal country of birth, Est = -10.397, SE Est = 4.912, 95% CI: [-23.843, -1.112], p = .034. None of the mediation models were significant for either time point.

Moderated mediation models predicting child behavior problems. Table 15 presents a second set of models predicting child behavior problems at 3 and 4.5 years from concentrated disadvantage, residential instability, percentage residents identifying as Hispanic/Latino, the interaction effect of concentrated disadvantage and percentage residents Hispanic/Latino, the interaction effect of residential instability and percentage residents Hispanic/Latino, and maternal PPD symptoms. Child behavior problems at 3 years were significantly predicted by maternal PPD symptoms, Est = 0.187, SE Est = 0.073, 95% CI: [0.050, 0.344], p = .011, and concentrated disadvantage, Est = 5.285, SE Est 2.635, 95% CI: [0.665, 10.930], p = .045. The sum of the indirect effect from percentage residents Hispanic/Latino to child behavior problems at 3 years via maternal PPD symptoms was not statistically significant, 95% bootstrap CI: [-0.061, 0.012]. The sum of the indirect effect from the interaction effect of concentrated disadvantage and

percentage residents Hispanic/Latino to child behavior problems at 3 years via maternal PPD symptoms was not statistically significant, 95% bootstrap CI: [-0.007, 0.083]. The sum of the indirect effect from the interaction effect of residential instability and percentage residents Hispanic/Latino to child behavior problems at 3 years via maternal PPD symptoms was not statistically significant, 95% bootstrap CI: [-0.083, 0.010].

Child behavior problems at 4.5 years were significantly predicted by maternal PPD symptoms, Est = 0.269, SE Est = 0.072, 95% CI: [0.132, 0.407], $p < .001$, and percentage residents Hispanic/Latino, Est = -0.291, SE Est = 0.111, 95% CI: [-0.534, -0.087], $p = .009$. The sum of the indirect effect from percentage residents Hispanic/Latino to child behavior problems at 4.5 years via maternal PPD symptoms was not statistically significant, 95% CI: [-0.085, 0.015]. The sum of the indirect effect from the interaction effect of concentrated disadvantage and percentage residents Hispanic/Latino to child behavior problems at 4.5 years via maternal PPD symptoms was not statistically significant, 95% bootstrap CI: [-0.010, 0.104]. The sum of the indirect effect from the interaction effect of residential instability and percentage residents Hispanic/Latino to child behavior problems at 4.5 years via maternal PPD symptoms was not statistically significant, 95% bootstrap CI: [-0.102, 0.014].

Table 16 presents the set of moderated mediation models predicting child behavior problems at 3 and 4.5 years, adjusting for covariates (maternal country of birth, maternal age at prenatal visit, number of other biological children). Maternal PPD symptoms remained a significant predictor of child behavior problems at 3 years, Est = 0.191, SE Est = 0.076, 95% CI: [0.049, 0.349], $p = .012$. Concentrated disadvantage was

no longer a significant predictor of child behavior problems at 3 years, 95% CI: [-0.734, 9.691], $p = .133$. Child behavior problems at 3 years was significantly predicted by maternal country of birth, Est = 12.854, SE Est = 5.562, 95% CI: [-24.589, -2.134], $p = .021$. Maternal depressive symptoms, Est = 0.265, SE Est = 0.073, 95% CI: [0.129, 0.409], $p < .001$ and percentage residents Hispanic/Latino, Est = -0.250, SE Est = 0.107, 95% CI: [-0.472, -0.047], $p = .020$, remained significant predictors of child behavior problems at 4.5 years. None of the moderated mediation models were significant for either time point.

Exploratory analyses. Exploratory analyses reevaluated primary models accounting for clustering based on census tract. Table 17 presents the set of mediation models predicting child behavior problems at 3 and 4.5 years from concentrated disadvantage and residential instability mediated through maternal PPD symptoms, adjusting for covariates and clustering. Adjusting for clustering did not alter the model results. Maternal PPD symptoms and maternal country of birth remained significant predictors of child behavior problems at both 3 and 4.5 years. Maternal country of birth and maternal age at the prenatal visit remained significant predictors of maternal PPD symptoms.

Table 18 presents the set of moderated mediation models predicting child behavior problems at 3 and 4.5 years from concentrated disadvantage, residential instability, percentage residents identifying as Hispanic/Latino, the interaction effect of concentrated disadvantage and percentage residents Hispanic/Latino, the interaction effect of residential instability and percentage residents Hispanic/Latino, and maternal

PPD symptoms, adjusting for covariates and clustering. Maternal PPD symptoms and percentage residents Hispanic/Latino remained significant predictors of child behavior problems at 4.5 years. After adjusting for clustering, maternal country of birth significantly predicted child behavior problems at 4.5 years, Est = -9.303, SE Est = 4.697, 95% CI: [-18.535, -0.067]**,** p = .048. Maternal PPD symptoms and maternal country of birth remained significant predictors of child behavior problems at 3 years. Maternal country of birth and maternal age at the prenatal visit remained significant predictors of maternal PPD symptoms.

Given the results of moderated mediation models, a final set of models were tested evaluating the percentage residents identifying as Hispanic/Latino on child behavior problems at 3 and 4.5 years as mediated through maternal PPD symptoms. Figure 6 presents the mediation model, adjusting for covariates. The sum of the indirect effects from percentage of residents identifying as Hispanic/Latino to child behavior problems at 3 years via maternal PPD symptoms was statistically significant, Est = -0.026, SE Est = 0.015, 95% bootstrap CI: [-0.058, -0.001]. The sum of the indirect effects from percentage of residents identifying as Hispanic/Latino to child behavior problems at 4.5 years via maternal PPD symptoms was statistically significant, Est = -0.042, SE Est = 0.022, 95% bootstrap CI: [-0.089, -0.005].

DISCUSSION

A growing body of work supports the notion that neighborhoods play a crucial role in the emergence of mental health disparities throughout development. Latino children are far more likely to live in disadvantaged neighborhoods than their non-minority peers (Kids Count Data Center, 2017), yet the majority of neighborhood research involves adolescent and adult samples of European American or African American families (White & Roosa, 2012). The current study evaluated the direct and indirect (via maternal PPD symptoms) influences of structural neighborhood characteristics (concentrated disadvantage, residential instability, and percentage of residents identifying as Hispanic/Latino) on children's behavior problems at 3 and 4.5 years. I hypothesized that living in a neighborhood with higher concentrated disadvantage and higher residential instability would predict greater maternal PPD symptoms and child behavior problems. The percentage of residents identifying as Hispanic/Latino was expected to moderate the effects of concentrated disadvantage and residential instability on maternal PPD symptoms and child behavior problems, such that living in a neighborhood with a higher percentage of residents identifying as Hispanic/Latino would be protective against poor mental health outcomes. Although concentrated disadvantage and residential instability were not found to be significant neighborhood predictors of child behavior problems, results supported the notion that the neighborhood cultural context (percentage of residents identifying as Hispanic/Latino) may be operating protectively.

Contrary to hypotheses, living in a neighborhood with more concentrated disadvantage did not predict higher maternal PPD symptoms or child behavior problems at 3 or 4.5 years. Substantial work consistently documents the deleterious effects of living in a neighborhood with high levels of concentrated disadvantage on depressive symptoms throughout development (Mair et al., 2008; Xue et al., 2005), prompting discussion of why this effect does not replicate in the current study. From a social disorganization theoretical perspective, living in a neighborhood with high concentrated disadvantage is associated with low neighborhood social capital, weakened social ties between neighbors, and less collective efficacy (Sampson et al., 1997), which is theorized to put individuals at increased risk for maladaptive mental health outcomes (Sampson et al., 2002; Cutrona et al., 2006).

Given the high percentage of first-generation immigrant mothers (86%) in the current study, one potential explanation for the lack of an effect of concentrated disadvantage on maternal PPD symptoms may be a "dual frame of reference" hypothesis. Suárez-Orozco & Suárez-Orozco (1995) suggest that this "dual frame of reference" enables first-generation immigrants to view their current life as substantially better than their old life. Perhaps, despite living in neighborhoods of high concentrated disadvantage in the United States, recent immigrants perceive less disadvantage relative to the neighborhoods from which they moved. Recent work among adolescents suggests immigrant generational status to be a distinguishing individual characteristic relevant to understanding neighborhood effects on internalizing symptoms (Lara-Cinisomo, Xue, Brooks-Gunn, 2013). Future work may aim to address this "dual frame" hypothesis by

evaluating immigrant generation status, or number of years in the U.S., as a moderator of the relation between concentrated disadvantage on mental health outcomes. Post hoc analyses explored this hypothesis in the current study, but the number of years in the U.S. did not moderate the effect of concentrated disadvantage on maternal PPD symptoms in this sample.

Measures of subjective neighborhood experiences may also be relevant to understanding the lack of concentrated disadvantage finding. The current sample is disadvantaged at the family-level (modal family income was $10,001 - $15,000 for an average household of four people). Additionally, the current sample of families is living in neighborhoods that are, on average, more disadvantaged than the broader Maricopa County, Arizona average (see Table 19). The lack of observed effect of concentrated disadvantage on maternal and child mental health outcomes may indicate a floor effect or reflect the current study's evaluation of disadvantage in the context of disadvantage. Perhaps, in the context of significant familial-level disadvantage, concentrated disadvantage may have less of an effect on mental health. Among a sample of disadvantaged families, perceptions of neighborhood disadvantage may distinguish neighborhood experiences and contribute to multifinality in mental health outcomes.

The residential instability mediation models followed a pattern of results similar to the concentrated disadvantaged mediation models. Higher residential instability was not associated with more maternal PPD symptoms or children's behavior problems at either timepoint. Statistical and theoretical perspectives may explain the lack of residential instability effects. The residential instability composite is traditionally

comprised of the percentage of residents who have moved in the last five years and the percentage of residents renting (vs. owning). These two variables were not highly correlated in this sample of neighborhoods (r = .178), raising questions about the measurement utility of this composite predictor in the current study. Social disorganization theory and the traditional residential instability composite were largely developed from investigations of Chicago neighborhoods (Shaw & McKay, 1942; Sampson & Groves, 1989). There may be aspects of Chicago neighborhoods that do not generalize to Phoenix. According to recent American Community Survey data, of the twenty largest metropolitan areas in the United States, Phoenix exhibited the highest percentage of residents who moved in the last year (U.S. Census Bureau, 2015). Perhaps, residential instability is more prevalent in Phoenix, regardless of whether you are renting vs. owning a home, and that contributes to the low correlation between neighborhood indicators entering the residential instability composite.

Although residential instability is frequently theorized to be a proxy measure of weakened social ties and collective efficacy among a neighborhood's residents, stability may not necessarily be protective in the context of disadvantage (Ross, Reynolds, & Geis, 2000; Drukker, Kaplan, & van Os, 2005; Anderson, Leventhal, Newman, & Dupéré, 2014). Residential instability might actually indicate opportunities for mobility out of disadvantaged neighborhoods. On the contrary, stability in the context of impoverished neighborhoods may be associated with longer and more consistent exposure to disadvantage, which places individuals at greater risk for maladaptive outcomes (Chetty & Hendren, 2015). However, lower residential instability was not

associated with more maternal PPD symptoms or child behavior problems either. In a sample of children of all ages (mean age = 10 years), family support reduced the effects of residential instability on parent-child conflict for Hispanic/Latino families (Riina, Lippert, & Brooks-Gunn, 2016). A more nuanced approach to understanding the effects of residential instability, contingent on other neighborhood- and family-level indicators, on mental health outcomes may be beneficial to determining when and whether stability is protective.

Also contrary to predictions, higher maternal PPD symptoms did not mediate the relation between neighborhood structural characteristics (concentrated disadvantage, residential instability) and child behavior problems at 3 or 4.5 years, failing to support a family stress hypothesis. As previously described, I did not find effects of neighborhood concentrated disadvantage or residential instability on maternal PPD symptoms, precluding the possibility of mediation. A previous study reported direct effects of neighborhood concentrated disadvantage and residential instability on children's mental health as early as five years of age, above and beyond maternal depressive symptoms (Xue et al., 2005), raising the question of why these neighborhood indicators were not predictive of children's mental health outcomes in this sample. The current study is the first to my knowledge to examine neighborhood-level influences among 3- and 4.5-year-old Latino children. Direct effects of concentrated disadvantage and residential instability may not emerge until an older age in this population. In the Xue et al. (2005) study, children of all ages were grouped together for neighborhood analyses. During the first few years of life, more proximal indicators of risk may be more powerful predictors of

children's behavior problems. Only 38% of the 5- to 11-year-olds in the Xue et al. (2005) sample were of Mexican-origin ethnic identity, compared to 100% of the current sample. The mean family income-to-needs ratio in the Xue et al. (2005) study was twice the poverty threshold, notably different from the current sample of low-income families. These demographic differences may explain inconsistent findings across studies.

Recent work with older Mexican American youth suggests that concentrated disadvantage may be a less relevant predictor of mental health outcomes for this ethnic group (White, Deardorff, & Gonzales, 2011; White, Zeiders, & Safa, 2018). Communities living in neighborhoods with high levels of concentrated disadvantage may possess protective factors or develop strategies for promoting adaptive mental health outcomes; in other words, opportunities may still exist in the context of risk. With this perspective, I hypothesized that for participants living in more disadvantaged neighborhoods, a higher percentage of Hispanic/Latino residents would be protective against poor mental health outcomes for mothers and children. However, the results did not support the hypotheses. There was a high positive correlation between neighborhood concentrated disadvantage and the percentage of residents identifying as Hispanic/Latino in this sample (r = .674). A limited number of families in this sample were living in neighborhoods with below-average concentrated disadvantage and above-average Hispanic/Latino concentration (n = 50; 15.5%) or neighborhoods with above-average concentrated disadvantage and below-average Hispanic/Latino concentration (n = 20; 6.2%) (see Figure 7).

A greater number of families living in neighborhoods with high concentrated disadvantage and low percentage Hispanic/Latino, or neighborhoods with low concentrated disadvantage and a high percentage Hispanic/Latino would allow for a stronger test of moderated effects. For example, women living in neighborhoods with higher concentrated disadvantage (1+ SD above the mean) reported the same number of depressive symptoms regardless of their neighborhood's ethnic concentration (see Figure 8). Among women living in neighborhoods with lower concentrated disadvantage (1+ SD below the mean), women living in neighborhoods with a low percentage of Hispanic/Latino residents (1+ SD below the mean) reported greater depressive symptomatology (M = 24.77) than those living in neighborhoods with a high percentage of Hispanic/Latino residents (1+ SD above the mean; M = 17.75). Perhaps, women are more likely to reap the mental health benefits of living in an ethnic enclave only in less disadvantaged environments.

Similarly, women living in neighborhoods with high concentrated disadvantage and a high percentage of Hispanic/Latino residents reported fewer behavior problems for their 4.5-year-old children (M = 20.00) than women living in neighborhoods with low concentrated disadvantage and a low percentage of Hispanic/Latino residents (M = 26.57). However, contrary to maternal PPD symptoms, the effects of neighborhood ethnic concentration on 4.5-year-old children seem to exist in the context of disadvantage (see Figure 9). Among only neighborhoods with high concentrated disadvantage, women living in neighborhoods with a high percentage of Hispanic/Latino residents reported

fewer behavior problems in their 4.5-year-old children (M = 20.00) than women living in neighborhoods with a low percentage of Hispanic/Latino residents (M = 32.83).

Although results did not support evidence of moderated effects, the percentage of residents identifying as Hispanic/Latino emerged as a significant predictor of both maternal PPD symptoms and children's behavior problems at 4.5 years, even when controlling for other neighborhood characteristics and covariates (maternal age at prenatal visit, maternal country of birth, number of other biological children). Women living in neighborhoods with a higher percentage of residents identifying as Hispanic/Latino reported fewer PPD symptoms and fewer behavior problems in their children at 4.5 years of age. Additionally, maternal PPD symptoms significantly mediated the effect of the percentage of residents identifying as Hispanic/Latino on children's behavior problems at 3 and 4.5 years. When taken together, these findings support the notion that the ethnocultural neighborhood context may be protective against poor mental health outcomes among Mexican American mothers and children.

Future work should aim to understand *why* and *how* the neighborhood ethnocultural context might be operating protectively among Latino samples. White et al. (2018) highlight the importance of uniting a social disorganization perspective and a segmented assimilation perspective in examinations of neighborhood influences among Latino families. In line with both perspectives, shared ethnic and cultural identity among neighbors may promote stronger social support at the neighborhood level, greater collective efficacy, and greater social capital (Sampson et al., 1997; Vega et al., 2011; White et al., 2018), even in the context of socioeconomic disadvantage. Higher

neighborhood Hispanic/Latino concentration has also been associated with more maternal warmth and neighborhood familism (Gonzales et al., 2011). By affecting maternal support, mental health, and behavior, neighborhood Hispanic/Latino concentration has the potential to indirectly influence children's adaptive functioning. Familism values, central to traditional Mexican culture, promote loyalty, mutual-support, and the importance of placing the needs of your family above your own (Castillo & Cano, 2007). Neighborhoods with a greater concentration of Mexican American families may exhibit community-wide familism values, or family-like social networks among non-biological family members (Gonzales et al., 2011).

In addition to promoting an adaptive and organized social climate, higher Hispanic/Latino concentration may be associated with decreased risk of negative life events related to individual ethnic identity. Latinos living in a neighborhood with majority Hispanic/Latino concentration may experience less ethnic-racial discrimination and higher ethnic-racial identity resolution (White et al., 2018), both of which promote more adaptive mental health (Araújo & Borrell, 2006; Priest et al., 2013). Evaluating potential mechanisms underlying the effect of neighborhood cultural context on mental health will be critical to progressing our understanding of protective neighborhood factors, especially in the context of neighborhood- and individual-level risk.

The current findings should be interpreted considering several limitations. As discussed in the methods section, neighborhood-level data were gathered for families already enrolled in the longitudinal *Las Madres Nuevas* (LMN) project. Because LMN was not originally intended for neighborhood-level analyses, subjective neighborhood-

level data were not obtained. A growing body of research emphasizes the importance of understanding the interplay between individuals' subjective experiences of their neighborhoods and objective neighborhood characteristics. Subjective experiences are often understood as potential mediators and moderators of the impact of objective neighborhood characteristics on mental health outcomes. Given this study is the first, to my knowledge, to evaluate neighborhood influences in a sample of Latino children before age 5, future work may aim to build on objective evaluations of neighborhood influence by incorporating subjective measures among mothers and children.

The current study also cannot evaluate the effects of moving to higher or lower advantaged neighborhoods after the prenatal visit. Neighborhoods continuously and concurrently influence pathways of mental health, however the current study is limited by the assumption that the prenatal neighborhood is independently influential to subsequent mental health. Given that residents of disadvantaged neighborhoods often live in neighborhoods of similar type for the duration of their childhood (Quillian, 2003), it is important to explore this latter assumption.

However, by focusing on the prenatal neighborhood context as a predictor of subsequent maternal and child mental health, the current study offers a unique, longitudinal perspective. Prenatal programming research provides evidence suggesting environmental influences to first occur in utero via maternal stress (King, Kane, Scarbrough, Hoyo, & Murphy, 2016). Perinatal environmental exposure can predispose fetuses towards differential outcomes evident in later development. Preliminary work implicates the neighborhood context, specifically neighborhood disadvantage, in the

prenatal programming of adult cancer risk via increased DNA methylation (King et al., 2016). Although the current study does not evaluate genetic altercations relevant to children's mental health, findings support the notion that the prenatal neighborhood context is predictive of children's mental health outcomes 3 and 4.5 years later. Given theoretical perspectives and recent evidence suggesting greater neighborhood Hispanic/Latino concentration to be associated with increased neighborhood-level social support, the prenatal neighborhood ethnic concentration may be especially relevant to maternal stress during the perinatal period.

The current study possesses several strengths and addresses gaps in existing literature. This study is the first to my knowledge to extend our understanding of neighborhood influences on children's mental health as early as the preschool period among a sample of Mexican American children. In addition to evaluating the direct effects of neighborhoods on children's behavior problems, this study assessed maternal PPD symptoms as a potential mechanism underlying neighborhood influences on child mental health. By evaluating the neighborhood ethnic makeup in addition to typical indicators of risk (concentrated disadvantage and residential instability), findings from the current study suggest traditional indicators of neighborhood risk may not be as relevant to mental health outcomes among low-SES Mexican American mothers and children as they are to other racial or ethnic groups. Instead, the neighborhood Hispanic/Latino concentration may be an important indicator of protective neighborhood processes, even in the context of disadvantage. Given that the current study provided preliminary support for the protective influence of neighborhood ethnic composition on

young children's mental health outcomes, future work may aim to understand alternative familial mechanisms underlying neighborhood ethnocultural influence. Perhaps, measures of parenting behavior will be more informative indicators of mechanistic processes than psychopathology symptoms.

The results from the current study have several implications. Primarily, the results highlight the importance of understanding neighborhood influences on children's mental health, even during the first several years of life. The results provided evidence of prenatal neighborhood influence on children's behavior problems at 3 and 4.5 years of age, directly and indirectly via maternal PPD symptoms. Although traditional neighborhood indicators of risk, concentrated disadvantage and residential instability, were not predictive of maternal or child mental health outcomes, a higher neighborhood Hispanic/Latino concentration emerged as a protective factor for mothers and their children. These results correspond with recent literature among older children and adolescents highlighting the need for a more nuanced and culturally relevant approach to understanding neighborhood influences among Latino samples. The neighborhood ethnocultural context may operate protectively in pathways of Mexican American maternal and child mental health, even in the context of neighborhood- and individual-level risk. Identifying protective neighborhood resources within disadvantaged contexts has important implications for policy related to neighborhood intervention and child outcomes. By taking a strengths-based approach, we can aim to understand and support existing protective mechanisms within communities. A recent Pew Research Center projection predicted the Latino share of the U.S. population to reach 24% by 2065 (Pew

Research Center, 2017). There is and will continue to be a great need for an evidence-based, contextual understanding of mental health specific to Latino families.

Figure 1. Conceptual Model

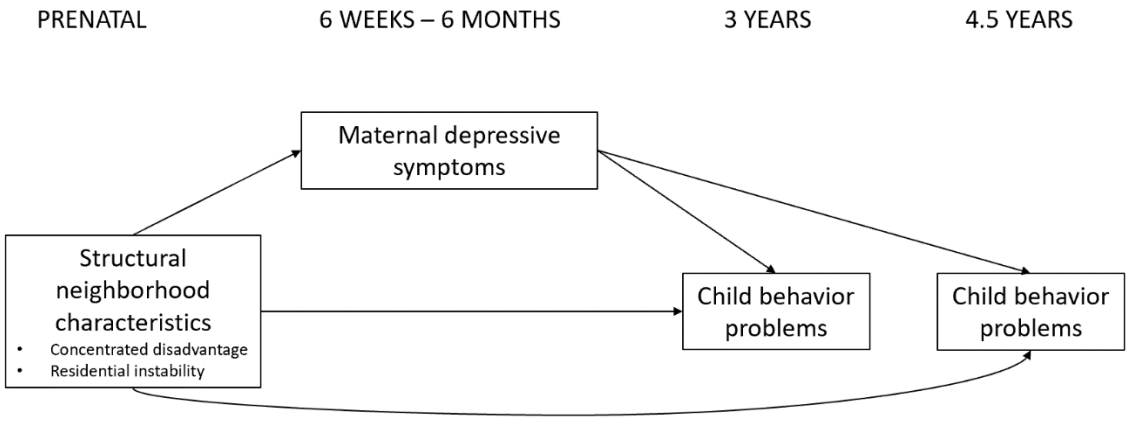


Figure 2. Conceptual Model with Moderated Effect

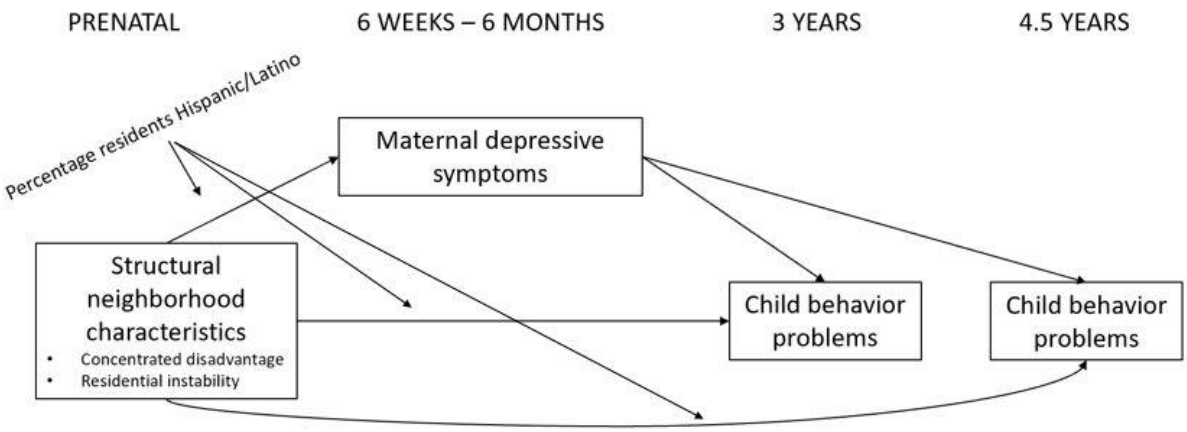


Figure 3. Hypothesized Moderated Effect

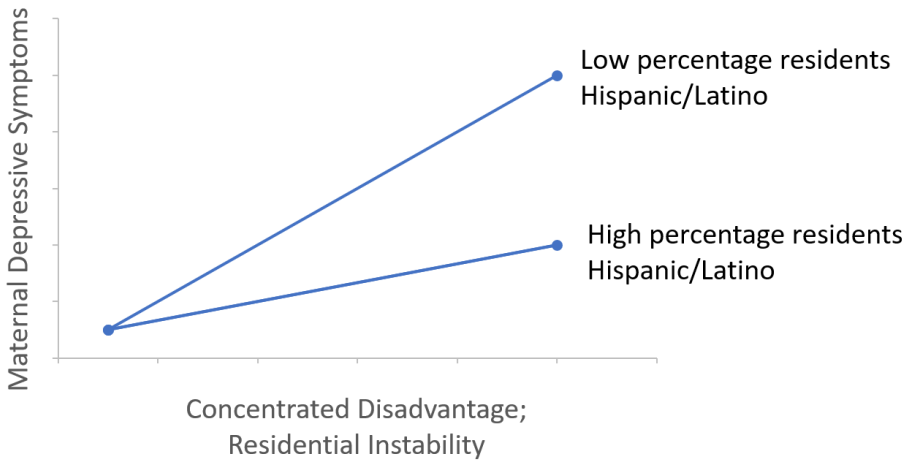


Table 1.

Descriptive Statistics of Unstandardized Neighborhood Characteristics Entering Composite Variables ($N_{families}$ = 322; $N_{neighborhoods}$ = 152)

	Mean	SD	Skewness	Kurtosis	Range
Percentage residents living in poverty	36.74	15.39	0.24	-0.35	3.20, 75.50
Percentage residents unemployed	11.83	7.50	5.37	58.86	1.90, 100.00
Percentage residents living in female-headed households	19.90	6.24	1.78	6.83	3.40, 50.70
Percentage residents under eighteen	32.07	7.40	-0.879	0.89	0.90, 47.20
Percentage residents on public assistance	44.25	16.62	0.34	0.07	1.75, 100.00
Percentage residents who have moved in the last year	20.83	8.68	0.80	0.68	0, 49.13
Percentage residents renting vs. owning	59.21	19.25	-0.48	-0.24	8.60, 95.70

Table 2.

Zero-order Correlations among Variables Comprising Concentrated Disadvantage Composite

		1	2	3	4
1.	Percentage residents living in poverty	---			
2.	Percentage residents unemployed	**.325**	---		
3.	Percentage residents living in female-headed households	**.561**	**.207**	---	
4.	Percentage residents under eighteen	**.643**	-.003	**.596**	---
5.	Percentage residents on public assistance	**.840**	**.503**	**.569**	**.338**

Note. Correlation coefficients presented in bold are statistically significant, $p < .05$.

Table 3.

Zero-order Correlations among Variables Comprising Residential Instability Composite

	1	2
1. Percentage residents who have moved in the last year	---	
2. Percentage residents renting (vs. owning)	**.178**	---

Note. Correlation coefficients presented in bold are statistically significant, $p < .05$.

Table 4.

Descriptive Statistics of Primary Study Variables

	N	Mean	SD	Skewness	Kurtosis	Range
Concentrated disadvantage	322	0.00	0.73	0.58	1.32	-1.70, 2.61
Residential instability	322	0.00	0.85	0.17	0.45	-2.51, 2.58
Percentage residents Hispanic/Latino	322	63.63	19.15	-0.75	-0.33	12.40, 92.60
Maternal depressive symptoms from 6 weeks to 6 months (AUCg)	322	21.95	20.98	1.16	0.67	0, 100.50
Child behavior problems at 3 years	215	28.25	21.27	1.34	2.26	1.00, 131.00
Child behavior problems at 4.5 years	230	30.72	21.78	1.03	0.74	0, 105.00

Table 5.

Zero-order Correlations among Primary Study Variables

		1	2	3	4	5
1.	Concentrated disadvantage	---				
2.	Residential instability	**.178**	---			
3.	Percentage residents Hispanic/Latino	**.674**	-.032	---		
4.	Maternal depressive symptoms from 6 weeks to 6 months (AUCg)	-.102	-.015	**-.146**	---	
5.	Child behavior problems at 3 years	.069	-.003	-.027	**.161**	---
6.	Child behavior problems at 4.5 years	-.095	-.024	**-.171**	**.282**	**.603**

Note. Correlation coefficients presented in bold are statistically significant, $p < .05$.

Table 6.

Direct Effects of Concentrated Disadvantage Predicting Child Behavior Problems at 3 and 4.5 Years, Adjusting for Covariates

DV	IV	B	SE B	p	R^2
Child behavior problems at 3 years					0.087
	Concentrated disadvantage	1.569	1.870	0.401	
	Maternal country of birth	-13.892	5.340	**0.009**	
	Maternal age at prenatal visit	-0.318	0.285	0.264	
	Number of other biological children	-0.407	1.219	0.738	
Child behavior problems at 4.5 years					0.057
		-3.512	2.010	0.081	
	Concentrated disadvantage	-11.845	4.617	**0.010**	
	Maternal country of birth	-0.015	0.277	0.958	
	Maternal age at prenatal visit	-0.651	1.213	0.592	
	Number of other biological children				

Note. * indicates statistically significant, $p < 0.05$.

Table 7.

Direct Effects of Residential Instability Predicting Child Behavior Problems at 3 and 4.5 Years, Adjusting for Covariates

DV	IV	B	SE B	p	R^2
Child behavior problems at 4.5 years					0.041
	Residential instability	-0.617	1.596	0.699	
	Maternal country of birth	-11.127	4.637	**0.016**	
	Maternal age at prenatal visit	-0.003	0.280	0.990	
	Number of other biological children	-0.735	1.211	0.544	
Child behavior problems at 3 years					0.087
	Residential instability	-0.599	1.437	0.677	
	Maternal country of birth	-14.533	5.172	**0.005**	
	Maternal age at prenatal visit	-0.321	0.287	0.263	
	Number of other biological children	-0.329	1.238	0.790	

Note. * indicates statistically significant, $p < 0.05$.

Table 8.

Direct Effects of Percentage Residents Hispanic/Latino Predicting Child Behavior Problems at 3 and 4.5 Years, Adjusting for Covariates

DV	IV	B	SE B	p	R^2
Child behavior problems at 4.5 years					0.067
	Percentage residents Hispanic/Latino	-0.189	0.069	**0.006**	
	Maternal country of birth	-10.774	4.511	**0.017**	
	Maternal age at prenatal visit	-0.019	0.273	0.946	
	Number of other biological children	-0.576	1.194	0.630	
Child behavior problems at 3 years					0.086
	Percentage residents Hispanic/Latino	-0.019	0.066	0.768	
	Maternal country of birth	-14.449	5.171	**0.005**	
	Maternal age at prenatal visit	-0.337	0.287	0.241	
	Number of other biological children	-0.229	1.230	0.853	

Note. * indicates statistically significant, $p < 0.05$.

Table 9.

Base Models Predicting Child Behavior Problems at 3 and 4.5 Years

DV	IV	B	SE B	p	R^2
Child behavior problems at 4.5 years					0.033
	Concentrated disadvantage	1.364	2.400	0.570	
	Residential instability	-0.951	1.668	0.569	
	Percentage residents Hispanic/Latino	-0.237	0.090	**0.009**	
Child behavior problems at 3 years					0.017
	Concentrated disadvantage	5.153	2.537	**0.042**	
	Residential instability	-1.327	1.519	0.382	
	Percentage residents Hispanic/Latino	-0.165	0.090	0.068	

Note. * indicates statistically significant, $p < 0.05$.

Table 10.

Base Models Predicting Child Behavior Problems at 3 and 4.5 Years, Adjusting for Covariates

DV	IV	B	SE B	p	R^2
Child behavior problems at 4.5 years					0.067
	Concentrated disadvantage	0.419	2.572	0.871	
	Residential instability	-0.842	1.642	0.608	
	Percentage residents Hispanic/Latino	-0.201	0.089	**0.023**	
	Maternal country of birth	-10.642	4.539	**0.019**	
	Maternal age at prenatal visit	-0.020	0.276	0.941	
	Number of other biological children	-0.622	1.201	0.604	
Child behavior problems at 3 years					0.090
	Concentrated disadvantage	4.077	2.591	0.116	
	Residential instability	-1.216	1.494	0.416	
	Percentage residents Hispanic/Latino	-0.124	0.088	0.161	
	Maternal country of birth	-13.069	5.373	**0.015**	
	Maternal age at prenatal visit	-0.333	0.286	0.244	
	Number of other biological children	-0.383	1.215	0.753	

Note. * indicates statistically significant, $p < 0.05$.

Table 11.

Base Models Predicting Child Behavior Problems at 3 and 4.5 Years with Interaction Terms

DV	IV	B	SE B	p	R^2
Child behavior problems at 4.5 years					0.048
	Concentrated disadvantage	2.787	2.472	0.259	
	Residential instability	-2.543	1.797	0.157	
	Percentage residents Hispanic/Latino	-0.339	0.107	**0.002**	
	CD x residents Hispanic/Latino	-0.100	0.104	0.339	
	RI x residents Hispanic/Latino	-0.143	0.088	0.104	
Child behavior problems at 3 years					0.018
	Concentrated disadvantage	5.123	2.616	**0.050**	
	Residential instability	-1.086	1.920	0.572	
	Percentage residents Hispanic/Latino	-0.166	0.109	0.129	
	CD x residents Hispanic/Latino	-0.008	0.106	0.942	
	RI x residents Hispanic/Latino	0.020	0.085	0.817	

Note. * indicates statistically significant, $p < 0.05$.

Table 12.

Base Models Predicting Child Behavior Problems at 3 and 4.5 Years with Interaction Terms, Adjusting for Covariates

DV	IV	B	SE B	p	R^2
Child behavior problems at 4.5 years					0.077*
	Concentrated disadvantage	1.740	2.704	0.520	
	Residential instability	-2.913	1.738	0.207	
	Percentage residents Hispanic/Latino	-0.295	0.106	**0.005**	
	CD x residents Hispanic/Latino	-0.100	0.106	0.345	
	RI x residents Hispanic/Latino	-0.118	0.089	0.184	
	Maternal country of birth	-10.102	4.548	**0.026**	
	Maternal age at prenatal visit	-0.010	0.280	0.970	
	Number of other biological children	-0.650	1.208	0.590	
Child behavior problems at 3 years					0.096*
	Concentrated disadvantage	3.751	2.690	0.163	
	Residential instability	-0.494	1.831	0.787	
	Percentage residents Hispanic/Latino	-0.110	0.110	0.316	
	CD x residents Hispanic/Latino	-0.015	0.105	0.884	
	RI x residents Hispanic/Latino	0.063	0.088	0.474	
	Maternal country of birth	-13.734	5.337	**0.010**	
	Maternal age at prenatal visit	-0.344	0.294	0.241	
	Number of other biological children	-0.345	1.243	0.782	

Note. * indicates statistically significant, $p < 0.05$.

Table 13.

Mediation Model Predicting Child Behavior Problems at 3 and 4.5 Years, Without Covariates

DV	IV	B	SE B	p	R^2
Child behavior problems at 4.5 years					0.088*
	Maternal depressive symptoms	0.290	0.067	**0.000**	
	Concentrated disadvantage	-1.820	1.902	0.339	
	Residential instability	-0.806	1.612	0.617	
Child behavior problems at 3 years					0.041
	Maternal depressive symptoms	0.188	0.070	**0.007**	
	Concentrated disadvantage	2.910	1.816	0.109	
	Residential instability	-1.173	1.502	0.435	
Maternal depressive symptoms from 6 weeks to 6 months (AUCg)					0.010
	Concentrated disadvantage	-2.952	1.796	0.100	
	Residential instability	0.087	1.629	0.958	

Note. * indicates statistically significant, $p < 0.05$.

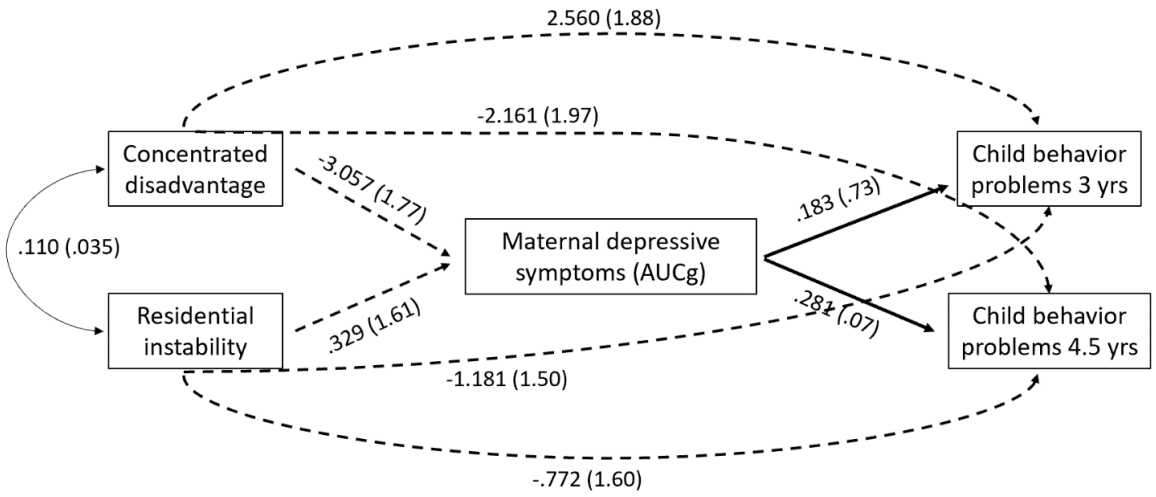
Table 14.

Mediation Model Predicting Child Behavior Problems at 3 and 4.5 Years, Adjusting for Covariates

DV	IV	B	SE B	p	R^2
Child behavior problems at 4.5 years					0.125*
	Maternal depressive symptoms	0.281	0.069	**0.000**	
	Concentrated disadvantage	-2.161	1.6965	0.271	
	Residential instability	-0.772	1.600	0.630	
	Maternal country of birth	-10.397	4.912	**0.034**	
	Maternal age at prenatal visit	-0.151	0.257	0.558	
	Number of other biological children	-0.304	1.196	0.799	
Child behavior problems at 3 years					0.116*
	Maternal depressive symptoms	0.182	0.073	**0.012**	
	Concentrated disadvantage	2.560	1.882	0.174	
	Residential instability	-1.182	1.496	0.430	
	Maternal country of birth	-12.504	5.609	**0.026**	
	Maternal age at prenatal visit	-0.421	0.279	0.132	
	Number of other biological children	-0.193	1.170	0.869	
Maternal depressive symptoms from 6 weeks to 6 months (AUCg)					0.040
	Concentrated disadvantage	-3.057	1.767	0.084	
	Residential instability	0.329	1.612	0.838	
	Maternal country of birth	-7.693	3.700	**0.038**	
	Maternal age at prenatal visit	0.517	0.238	**0.030**	
	Number of other biological children	0.001	0.926	0.999	

Note. * indicates statistically significant, $p < 0.05$.

Figure 4. Mediation Model[1]



[1]Solid lines are statistically significant; dashed lines are non-significant (unstandardized estimates and SEs are shown for both paths); Error terms and covariates (maternal country of birth, maternal age at prenatal visit, number of other biological children) not shown.

Table 15.

Moderated Mediation Model Predicting Child Behavior Problems at 3 and 4.5 Years, Without Covariates

DV	IV	B	SE B	p	R^2
Child behavior problems at 4.5 years					0.107*
	Maternal depressive symptoms	0.269	0.072	**0.000**	
	Concentrated disadvantage (CD)	2.957	2.491	0.235	
	Residential instability (RI)	-2.389	1.748	0.172	
	Percentage residents Hispanic/Latino	-0.291	0.111	**0.009**	
	CD x residents Hispanic/Latino	-0.131	0.103	0.201	
	RI x residents Hispanic/Latino	-0.094	0.094	0.320	
Child behavior problems at 3 years					0.052
	Maternal depressive symptoms	0.187	0.073	**0.011**	
	Concentrated disadvantage	5.285	2.635	**0.045**	
	Residential instability	-0.998	1.877	0.595	
	Percentage residents Hispanic/Latino	-0.138	0.116	0.235	
	CD x residents Hispanic/Latino	-0.042	0.109	0.703	
	RI x residents Hispanic/Latino	0.050	0.086	0.559	
Maternal depressive symptoms from 6 weeks to 6 months (AUCg)					0.040
	Concentrated disadvantage	0.206	2.240	0.927	
	Residential instability	-1.530	1.445	0.290	
	Percentage residents Hispanic/Latino	-0.137	0.100	0.169	
	CD x residents Hispanic/Latino	0.155	0.100	0.120	
	RI x residents Hispanic/Latino	-0.152	0.098	0.122	

Note. * indicates statistically significant, $p < 0.05$.

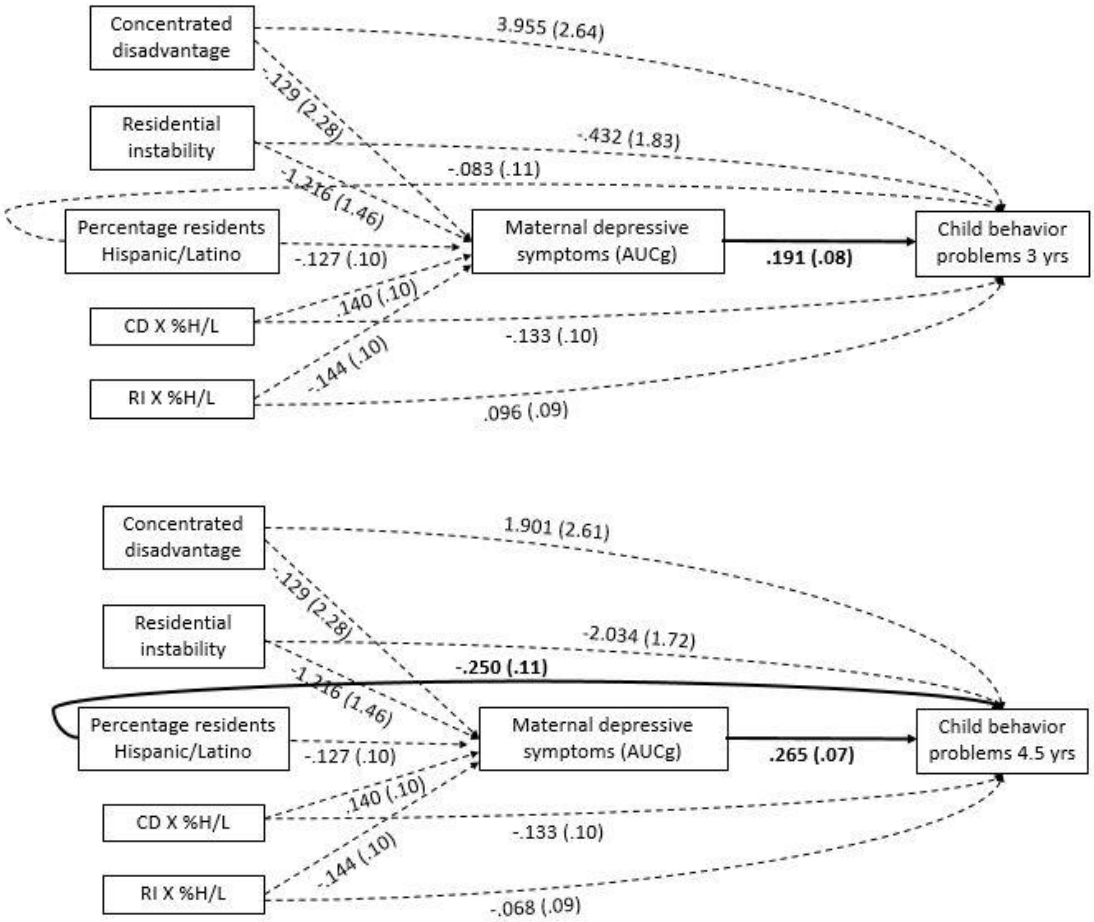
Table 16.

Moderated Mediation Model Predicting Child Behavior Problems at 3 and 4.5 Years, Adjusting for Covariates

DV	IV	B	SE B	p	R^2
Child behavior problems at 4.5 years					0.136*
	Maternal depressive symptoms	0.265	0.073	**0.000**	
	Concentrated disadvantage (CD)	1.901	2.612	0.467	
	Residential instability (RI)	-2.034	1.717	0.236	
	Percentage residents Hispanic/Latino	-0.250	0.107	**0.020**	
	CD x residents Hispanic/Latino	-0.133	0.101	0.188	
	RI x residents Hispanic/Latino	-0.068	0.094	0.468	
	Maternal country of birth	-9.303	4.834	0.054	
	Maternal age at prenatal visit	0.147	0.261	0.574	
	Number of other biological children	-0.263	1.201	0.827	
Child behavior problems at 3 years					0.129*
	Maternal depressive symptoms	0.191	0.076	**0.012**	
	Concentrated disadvantage	3.955	2.636	0.133	
	Residential instability	-0.432	1.827	0.813	
	Percentage residents Hispanic/Latino	-0.083	0.109	0.446	
	CD x residents Hispanic/Latino	-0.050	0.104	0.628	
	RI x residents Hispanic/Latino	0.096	0.090	0.287	
	Maternal country of birth	-12.854	5.562	**0.021**	
	Maternal age at prenatal visit	-0.450	0.290	0.121	
	Number of other biological children	-0.074	1.194	0.951	
Maternal depressive symptoms from 6 weeks to 6 months (AUCg)					0.064*
	Concentrated disadvantage	-0.129	2.275	0.955	
	Residential instability	-1.216	1.458	0.404	
	Percentage residents Hispanic/Latino	-0.127	0.099	0.201	
	CD x residents Hispanic/Latino	0.140	0.098	0.154	
	RI x residents Hispanic/Latino	-0.144	0.097	0.137	
	Maternal country of birth	-6.727	3.691	0.068	
	Maternal age at prenatal visit	0.494	0.231	**0.033**	
	Number of other biological children	-0.053	0.919	0.954	

Note. * indicates statistically significant, $p < 0.05$.

Figure 5. Moderated Mediation Models[1]



[1] Solid lines are statistically significant; dashed lines are non-significant (unstandardized estimates and SEs are shown for both paths); Error terms, covariates (maternal country of birth, maternal age at prenatal visit, number of other biological children), and covariance between predictors not shown.

Table 17.

Mediation Model Predicting Child Behavior Problems at 3 and 4.5 Years, Adjusting for Covariates and Clustering

DV	IV	B	SE B	p	R^2
Child behavior problems at 4.5 years					0.125*
	Maternal depressive symptoms	0.281	0.074	**0.000**	
	Concentrated disadvantage	-2.161	2.007	0.282	
	Residential instability	-0.772	1.813	0.670	
	Maternal country of birth	-10.397	4.830	**0.031**	
	Maternal age at prenatal visit	-0.151	0.244	0.538	
	Number of other biological children	-0.304	1.139	0.790	
Child behavior problems at 3 years					0.116
	Maternal depressive symptoms	0.182	0.075	**0.015**	
	Concentrated disadvantage	2.560	1.728	0.138	
	Residential instability	-1.182	1.737	0.496	
	Maternal country of birth	-12.504	5.329	**0.019**	
	Maternal age at prenatal visit	-0.421	0.258	0.103	
	Number of other biological children	-0.193	1.190	0.871	
Maternal depressive symptoms from 6 weeks to 6 months (AUCg)					0.040
	Concentrated disadvantage	-3.057	1.913	0.110	
	Residential instability	0.329	1.779	0.853	
	Maternal country of birth	-7.693	3.640	**0.035**	
	Maternal age at prenatal visit	0.517	0.218	**0.018**	
	Number of other biological children	0.001	0.911	0.999	

Note. * indicates statistically significant, $p < 0.05$.

Table 18.

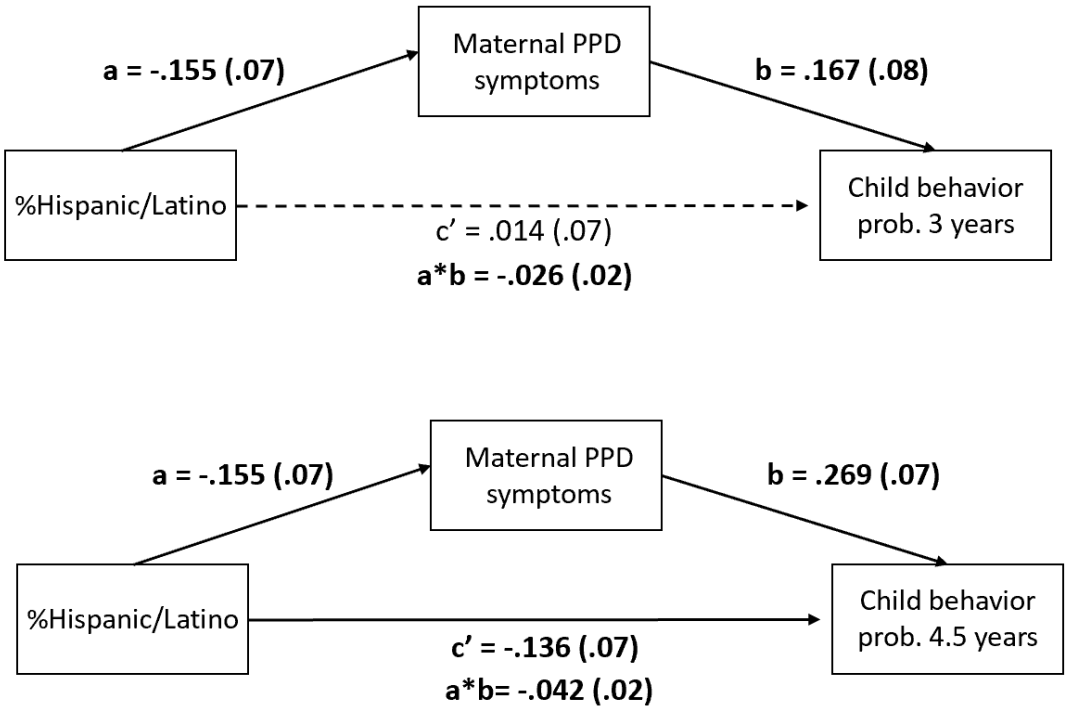
Moderated Mediation Model Predicting Child Behavior Problems at 3 and 4.5 Years, Adjusting for Covariates and Clustering

DV	IV	B	SE B	p	R^2
Child behavior problems at 4.5 years					0.136*
	Maternal depressive symptoms	0.265	0.079	**0.001**	
	Concentrated disadvantage (CD)	1.901	3.024	0.530	
	Residential instability (RI)	-2.034	1.856	0.273	
	Percentage residents Hispanic/Latino	-0.250	0.121	**0.039**	
	CD x residents Hispanic/Latino	-0.133	0.120	0.265	
	RI x residents Hispanic/Latino	-0.068	0.096	0.479	
	Maternal country of birth	-9.303	4.697	**0.048**	
	Maternal age at prenatal visit	0.147	0.246	0.550	
	Number of other biological children	-0.263	1.138	0.817	
Child behavior problems at 3 years					0.129
	Maternal depressive symptoms	0.191	0.076	**0.012**	
	Concentrated disadvantage	3.955	2.534	0.119	
	Residential instability	-0.432	1.894	0.820	
	Percentage residents Hispanic/Latino	-0.083	0.112	0.458	
	CD x residents Hispanic/Latino	-0.050	0.102	0.624	
	RI x residents Hispanic/Latino	0.096	0.097	0.321	
	Maternal country of birth	-12.854	5.405	**0.017**	
	Maternal age at prenatal visit	-0.450	0.271	0.096	
	Number of other biological children	-0.074	1.209	0.951	
Maternal depressive symptoms from 6 weeks to 6 months (AUCg)					0.064
	Concentrated disadvantage	-0.129	2.449	0.958	
	Residential instability	-1.216	1.404	0.386	
	Percentage residents Hispanic/Latino	-0.127	0.109	0.242	
	CD x residents Hispanic/Latino	0.140	0.098	0.155	
	RI x residents Hispanic/Latino	-0.144	0.109	0.185	
	Maternal country of birth	-6.727	3.678	0.067	
	Maternal age at prenatal visit	0.494	0.215	**0.022**	
	Number of other biological children	-0.053	0.912	0.954	

Note. * indicates statistically significant, $p < 0.05$.

Figure 6.

Mediation Models Predicting Child Behavior Problems at 3 and 4.5 Years from Percentage Residents Hispanic/Latino, Adjusting for Covariates[1]



[1]Solid lines are statistically significant; dashed lines are non-significant (unstandardized estimates and SEs are shown for both paths); Error terms and covariates (maternal country of birth, maternal age at prenatal visit, number of other biological children) not shown.

Table 19.

Comparison of Neighborhood Indicators for Maricopa County, AZ and LMN Sample

	Maricopa County Average	**LMN Sample**
Poverty rate	17.00%	36.84%
Female-headed households	19.00%	19.89%
Percent under eighteen	27.70%	32.10%
Percent on public assistance	12.30%	44.28%
Percent unemployed	4.00%	11.83%
% Hispanic	30.7%	63.68%

Figure 7.

Scatterplot Distribution of Concentrated Disadvantage and Percentage of Residents Identifying as Hispanic/Latino (Horizontal and Vertical Lines Indicate Means)

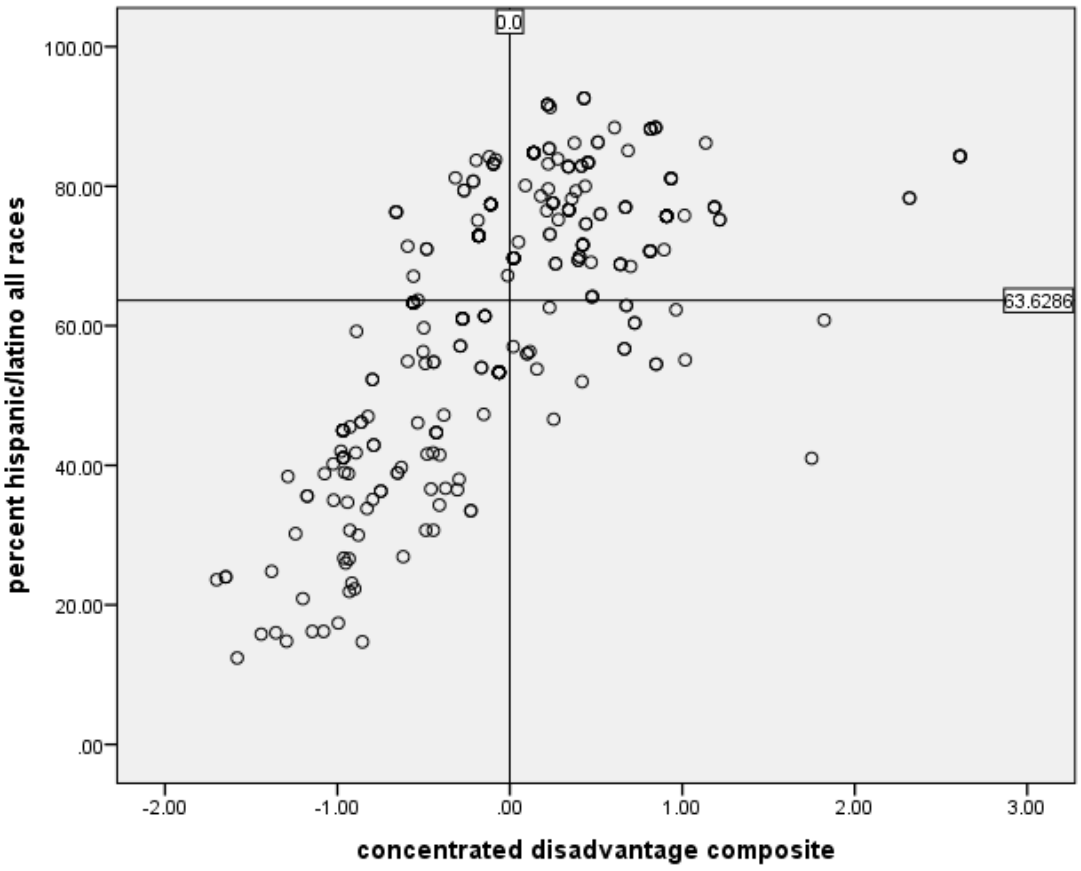


Figure 8.

The Effect of the Interaction of Concentrated Disadvantage and Percentage Residents Identifying as Hispanic/Latino on Maternal PPD Symptoms (Moderation Not Significant)

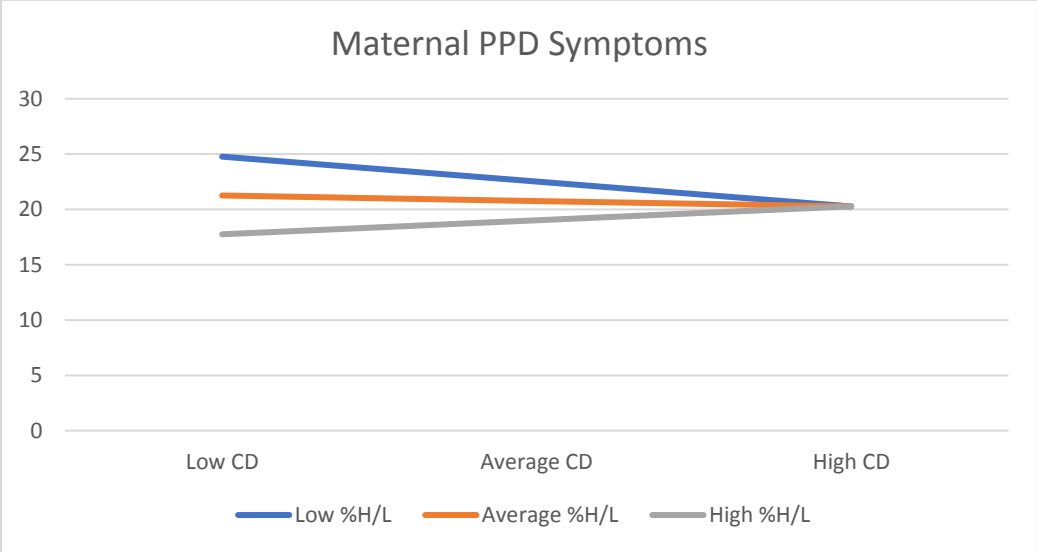
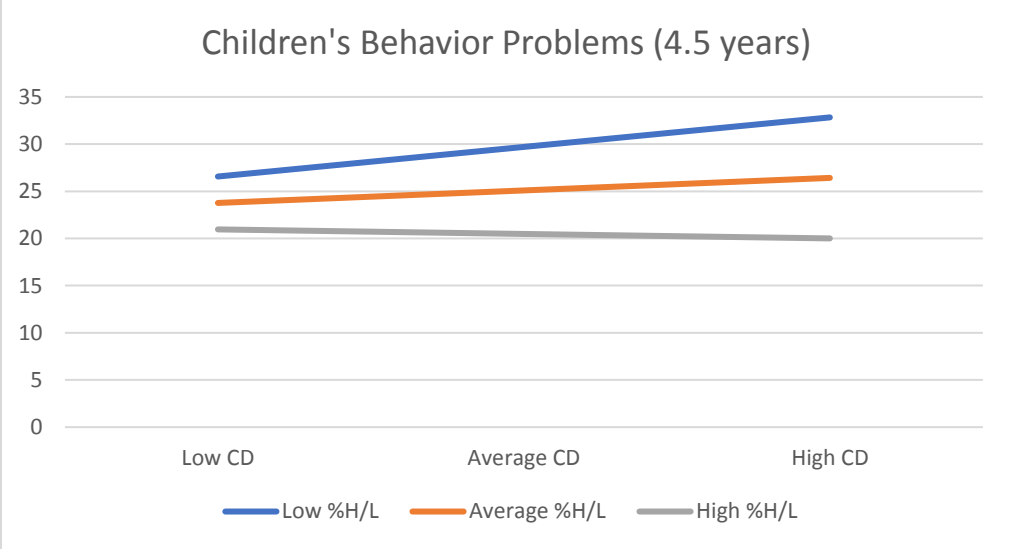


Figure 9.

The Effect of the Interaction of Concentrated Disadvantage and Percentage Residents Identifying as Hispanic/Latino on Children's Behavior Problems at 4.5 Years (Moderation Not Significant)



REFERENCES

Achenbach, T. (2001). Child Behavior Checklist for Ages 1.5-5 (CBCL/1.5-5). *Reporter*, *10*, 20.

Anderson, S., Leventhal, T., Newman, S., & Dupéré, V. (2014). Residential mobility among children: A framework for child and family policy. *Cityscape*, *16*(1), 5-36.

Aneshensel, C. S., & Sucoff, C. A. (1996). The neighborhood context of adolescent mental health. *Journal of health and social behavior*, 293-310.

Araújo, B. Y., & Borrell, L. N. (2006). Understanding the link between discrimination, mental health outcomes, and life chances among Latinos. *Hispanic Journal of Behavioral Sciences*, *28*(2), 245-266.

Brooks-Gunn, J., & Duncan, G. J. (1997). The effects of poverty on children. *The future of children*, 55-71.

Brooks-Gunn, J., Duncan, G. J., Klebanov, P. K., & Sealand, N. (1993). Do neighborhoods influence child and adolescent development?. *American journal of sociology*, *99*(2), 353-395.

Bronfenbrenner, U. (1977). Toward an experimental ecology of human development. *American psychologist*, *32*(7), 513.

Campos, B., Ullman, J. B., Aguilera, A., & Dunkel Schetter, C. (2014). Familism and psychological health: The intervening role of closeness and social support. *Cultural Diversity and Ethnic Minority Psychology*, *20*(2), 191.

Castillo, L. G., & Cano, M. A. (2007). Mexican American psychology: Theory and clinical application. *Cross-cultural psychotherapy: Toward a critical understanding of diverse client populations*, 85-102.

Chase-Lansdale, P. L., & Gordon, R. A. (1996). Economic hardship and the development of five- and six- year- olds: neighborhood and regional perspectives. *Child Development*, *67*(6), 3338-3367.

Chetty, R., Hendren, N., & Katz, L. F. (2016). The effects of exposure to better neighborhoods on children: New evidence from the Moving to Opportunity experiment. *American Economic Review*, *106*(4), 855-902.

Cox, J. L., Holden, J. M., & Sagovsky, R. (1987). Detection of postnatal depression: development of the 10-item Edinburgh Postnatal Depression Scale. *The British journal of psychiatry*, *150*(6), 782-786.

Cutrona, C. E., Wallace, G., & Wesner, K. A. (2006). Neighborhood characteristics and depression: An examination of stress processes. *Current directions in psychological science*, *15*(4), 188-192.

Dahl, T., Ceballo, R., & Huerta, M. (2010). In the eye of the beholder: Mothers' perceptions of poor neighborhoods as places to raise children. *Journal of Community Psychology*, *38*(4), 419-434.

Drukker, M., Kaplan, C., & van Os, J. (2005). Residential instability in socioeconomically deprived neighbourhoods, good or bad?. *Health & place*, *11*(2), 121-129.

Enders, C. K., & Bandalos, D. L. (2001). The relative performance of full information maximum likelihood estimation for missing data in structural equation models. *Structural equation modeling*, *8*(3), 430-457.

Evans, G. W. (2006). Child development and the physical environment. *Annu. Rev. Psychol.*, *57*, 423-451.

Freisthler, B., & Maguire-Jack, K. (2015). Understanding the interplay between neighborhood structural factors, social processes, and alcohol outlets on child physical abuse. *Child maltreatment*, *20*(4), 268-277.

Garcia-Esteve, L., Ascaso, C., Ojuel, J., & Navarro, P. (2003). Validation of the Edinburgh postnatal depression scale (EPDS) in Spanish mothers. *Journal of affective disorders*, *75*(1), 71-76.

Gonzales, N. A., Coxe, S., Roosa, M. W., White, R. M., Knight, G. P., Zeiders, K. H., & Saenz, D. (2011). Economic hardship, neighborhood context, and parenting: Prospective effects on Mexican–American adolescent's mental health. *American journal of community psychology*, *47*(1-2), 98-113.

Goodman, S. H., & Gotlib, I. H. (1999). Risk for psychopathology in the children of depressed mothers: a developmental model for understanding mechanisms of transmission. *Psychological review*, *106*(3), 458.

Goodman, S. H., Rouse, M. H., Connell, A. M., Broth, M. R., Hall, C. M., & Heyward, D. (2011). Maternal depression and child psychopathology: A meta-analytic review. *Clinical child and family psychology review*, *14*(1), 1-27.

Hahn-Holbrook, J., Holbrook, C., & Haselton, M. G. (2011). Parental precaution: Neurobiological means and adaptive ends. *Neuroscience & Biobehavioral Reviews*, *35*(4), 1052-1066.

Hox, J. (1998). Multilevel modeling: When and why. In *Classification, data analysis, and data highways* (pp. 147-154). Springer, Berlin, Heidelberg.

Isasi, C. R., Rastogi, D., & Molina, K. (2016). Health issues in Hispanic/Latino youth. *Journal of Latina/o psychology*, *4*(2), 67.

Kataoka, S. H., Zhang, L., & Wells, K. B. (2002). Unmet need for mental health care among US children: Variation by ethnicity and insurance status. *American Journal of Psychiatry*, *159*(9), 1548-1555.

Kids Count Data Center (2017). *Children in poverty by race and ethnicity*. Retrieved from https://datacenter.kidscount.org/data/tables/44-children-in-poverty-by-race-and-ethnicity.

King, K. E., Kane, J. B., Scarbrough, P., Hoyo, C., & Murphy, S. K. (2016). Neighborhood and family environment of expectant mothers may influence prenatal programming of adult cancer risk: discussion and an illustrative DNA methylation example. *Biodemography and social biology*, *62*(1), 87-104.

Klebanov, P. K., Brooks- Gunn, J., McCarton, C., & McCormick, M. C. (1998). The contribution of neighborhood and family income to developmental test scores over the first three years of life. *Child development*, *69*(5), 1420-1436.

Koblinsky, S. A., Kuvalanka, K. A., & Randolph, S. M. (2006). Social skills and behavior problems of urban, African American preschoolers: role of parenting practices, family conflict, and maternal depression. *American Journal of Orthopsychiatry*, *76*(4), 554.

Kohen, D. E., Leventhal, T., Dahinten, V. S., & McIntosh, C. N. (2008). Neighborhood disadvantage: Pathways of effects for young children. *Child development*, *79*(1), 156-169.

Lai, M. H., & Kwok, O. M. (2015). Examining the rule of thumb of not using multilevel modeling: The "design effect smaller than two" rule. *The Journal of Experimental Education*, *83*(3), 423-438.

Lara-Cinisomo, S., Xue, Y., & Brooks-Gunn, J. (2013). Latino youth's internalising behaviours: links to immigrant status and neighbourhood characteristics. *Ethnicity & health*, *18*(3), 315-335.

Lavigne, J. V., Gibbons, R. D., Christoffel, K. K., Arend, R., Rosenbaum, D., Binns, H., ... & Isaacs, C. (1996). Prevalence rates and correlates of psychiatric disorders among preschool children. *Journal of the American Academy of Child & Adolescent Psychiatry*, *35*(2), 204-214.

Leventhal, T., & Brooks-Gunn, J. (2000). The neighborhoods they live in: the effects of neighborhood residence on child and adolescent outcomes. *Psychological bulletin*, *126*(2), 309.

MacKinnon, D. P. (2008). *Introduction to statistical mediation analysis*. Routledge.

MacKinnon, D. P., Lockwood, C. M., & Williams, J. (2004). Confidence limits for the indirect effect: Distribution of the product and resampling methods. *Multivariate behavioral research*, *39*(1), 99-128.

Mair, C. F., Roux, A. V. D., & Galea, S. (2008). Are neighborhood characteristics associated with depressive symptoms? A critical review. *Journal of Epidemiology & Community Health*, jech-2007.

May, E. M., Azar, S. T., & Matthews, S. A. (2018). How Does the Neighborhood "Come through the Door?" Concentrated Disadvantage, Residential Instability, and the Home Environment for Preschoolers. *American journal of community psychology*, *61*(1-2), 218-228.

Muthen, B. O., & Satorra, A. (1995). Complex sample data in structural equation modeling. *Sociological methodology*, 267-316.

Pew Research Center. (2017). Facts on U.S. Latinos, 2015: statistical portrait of Hispanics in the United States. Retrieved from http://www.pewhispanic.org/2017/09/18/facts-on-u-s-latinos/.

Priest, N., Paradies, Y., Trenerry, B., Truong, M., Karlsen, S., & Kelly, Y. (2013). A systematic review of studies examining the relationship between reported racism and health and wellbeing for children and young people. *Social science & medicine*, *95*, 115-127.

Pruessner, J. C., Kirschbaum, C., Meinlschmid, G., & Hellhammer, D. H. (2003). Two formulas for computation of the area under the curve represent measures of total hormone concentration versus time-dependent change. *Psychoneuroendocrinology*, *28*(7), 916-931.

Quillian, L. (2003). How long are exposures to poor neighborhoods? The long-term dynamics of entry and exit from poor neighborhoods. *Population Research and Policy Review*, *22*(3), 221-249.

Rich-Edwards, J. W., Kleinman, K., Abrams, A., Harlow, B. L., McLaughlin, T. J., Joffe, H., & Gillman, M. W. (2006). Sociodemographic predictors of antenatal and

postpartum depressive symptoms among women in a medical group practice. *Journal of Epidemiology & Community Health*, *60*(3), 221-227.

Riina, E. M., Lippert, A., & Brooks- Gunn, J. (2016). Residential instability, family support, and parent–child relationships among ethnically diverse urban families. *Journal of Marriage and Family*, *78*(4), 855-870.

Rios, R., Aiken, L. S., & Zautra, A. J. (2011). Neighborhood contexts and the mediating role of neighborhood social cohesion on health and psychological distress among Hispanic and non-Hispanic residents. *Annals of Behavioral Medicine*, *43*(1), 50-61.

Ross, C. E., Reynolds, J. R., & Geis, K. J. (2000). The contingent meaning of neighborhood stability for residents' psychological well-being. *American Sociological Review*, 581-597.

Rubio-Stipec, M., Bird, H., Canino, G., & Gould, M. (1990). The internal consistency and concurrent validity of a Spanish translation of the Child Behavior Checklist. *Journal of Abnormal Child Psychology*, *18*(4), 393-406.

Sampson, R. J., & Groves, W. B. (1989). Community structure and crime: Testing social-disorganization theory. *American journal of sociology*, *94*(4), 774-802.

Sampson, R. J., Morenoff, J. D., & Gannon-Rowley, T. (2002). Assessing "neighborhood effects": Social processes and new directions in research. *Annual review of sociology*, *28*(1), 443-478.

Sampson, R. J., Raudenbush, S. W., & Earls, F. (1997). Neighborhoods and violent crime: A multilevel study of collective efficacy. *Science*, *277*(5328), 918-924.

Shaw, C. R., & McKay, H. D.(1942). Juvenile delinquency and urban areas. *Crime Readings*, 154-182.

Shonkoff, J. P., Phillips, D. A., & National Research Council. (2000). The developing brain.

Spencer, M. B. (1990). Development of minority children: An introduction. *Child Development*, 267-269.

Stampfel, C. (2013). *Life course indicator: Concentrated disadvantage* [Pamplhet]. Washington, DC: Association of Maternal & Child Health Programs.

Suárez-Orozco, C., & Suárez-Orozco, M. M. (1995). *Transformations: Immigration, family life, and achievement motivation among Latino adolescents*. Stanford University Press.

U.S. Census Bureau (2011). Community facts. Retrieved from https://factfinder.census.gov/faces/nav/jsf/pages/community_facts.xhtml?src=bkmk.

U.S. Census Bureau (2011). *2010 American Community Survey 1-year estimates*. Retrieved from http://factfinder2.census.gov.

U.S. Census Bureau (2015). *2014 American Community Survey 5-year estimates*. Retrieved from http://factfinder2.census.gov.

Vega, W. A., Ang, A., Rodriguez, M. A., & Finch, B. K. (2011). Neighborhood protective effects on depression in Latinos. *American journal of community psychology*, *47*(1-2), 114-126.

Villanueva, K., Badland, H., Kvalsvig, A., O'Connor, M., Christian, H., Woolcock, G., ... & Goldfeld, S. (2016). Can the neighborhood built environment make a difference in children's development? Building the research agenda to create evidence for place-based children's policy. *Academic pediatrics*, *16*(1), 10-19.

Wandersman, A., & Nation, M. (1998). Urban neighborhoods and mental health: Psychological contributions to understanding toxicity, resilience, and interventions. *American Psychologist*, *53*(6), 647.

White, R. M., Deardorff, J., & Gonzales, N. A. (2012). Contextual amplification or attenuation of pubertal timing effects on depressive symptoms among Mexican American girls. *Journal of Adolescent Health*, *50*(6), 565-571.

White, R., Liu, Y., Nair, R. L., & Tein, J. Y. (2015). Longitudinal and integrative tests of family stress model effects on Mexican origin adolescents. *Developmental psychology*, *51*(5), 649.

White, R., & Roosa, M. W. (2012). Neighborhood contexts, fathers, and Mexican American young adolescents' internalizing symptoms. *Journal of Marriage and Family*, *74*(1), 152-166.

White, R. M., Zeiders, K. H., & Safa, M. D. (2018). Neighborhood structural characteristics and Mexican-origin adolescents' development. *Development and psychopathology*, *30*(5), 1679-1698.

Wodtke, G. T., Harding, D. J., & Elwert, F. (2011). Neighborhood effects in temporal perspective: The impact of long-term exposure to concentrated disadvantage on high school graduation. *American Sociological Review, 76*(5), 713-736.

Xue, Y., Leventhal, T., Brooks-Gunn, J., & Earls, F. J. (2005). Neighborhood residence and mental health problems of 5-to 11-year-olds. *Archives of general psychiatry, 62*(5), 554-563.