

# Does Neighborhood Social Capital Buffer the Effects of Maternal Depression on Adolescent Behavior Problems?

Ayesha Delany-Brumsey · Vickie M. Mays · Susan D. Cochran

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**Abstract** Neighborhood characteristics have been shown to impact child well-being. However, it remains unclear how these factors combine with family characteristics to influence child development. The current study helps develop that understanding by investigating how neighborhoods directly impact child and adolescent behavior problems as well as moderate the influence of family characteristics on behavior. Using multilevel linear models, we examined the relationship among neighborhood conditions (poverty and social capital) and maternal depression on child and adolescent behavior problems. The sample included 741 children, age 5–11, and 564 adolescents, age 12–17. Outcomes were internalizing (e.g. anxious/depressed) and externalizing (e.g. aggressive/hyperactive) behavior problems. Neighborhood poverty and maternal depression were both positively associated with behavior problems for children and adolescents. However, while

neighborhood social capital was not directly associated with behavior problems, the interaction of social capital and maternal depression was significantly related to behavior problems for adolescents. This interaction showed that living in neighborhoods with higher levels of social capital attenuated the relationship between maternal depression and adolescent behavior problems and confirmed the expectation that raising healthy well-adjusted children depends not only on the family, but also the context in which the family lives.

**Keywords** Neighborhood · Social capital · Child · Adolescent · Behavior problems

## Introduction

Although there is a large and growing body of literature concerning the impact of neighborhoods and families on child behavior problems, what remains to be better understood is how the family and neighborhood environment combine to shape child and adolescent behavior. Over the last two decades, neighborhood social capital has emerged as an important contributing factor in understanding the behavior of individuals in their lived contexts (Almedom 2005; Snowden 2005). Social capital is a characteristic of groups that facilitates individuals working together for the common good (Putnam 1993) and has been found to be important during child development (Aneeshel 2009; Kohen et al. 2008; Sampson et al. 1999). Based on work by Sampson et al. (1997, 1999), we conceptualize social capital as having four facets: social cohesion, intergenerational closure, child-centered informal social control, and reciprocated exchange. Social cohesion refers to how much neighbors trust each other, are

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A. Delany-Brumsey (✉) · V. M. Mays  
Department of Psychology, University of California, Los Angeles, 1285 Franz Hall, Box 951563, Los Angeles, CA 90095-1563, USA  
e-mail: adelanybrumsey@gmail.com

V. M. Mays  
e-mail: maysv@nicco.sscnet.ucla.edu

A. Delany-Brumsey · V. M. Mays · S. D. Cochran  
UCLA Center on Bridging Research Innovation, Training and Education for Minority Health Disparities Solutions, Los Angeles, CA, USA  
e-mail: cochran@nicco.sscnet.ucla.edu

V. M. Mays · S. D. Cochran  
UCLA Fielding School of Public Health, University of California, Los Angeles, Los Angeles, CA, USA

willing to help each other, share the same values, and get along. Intergenerational closure is the degree of familiarity between neighborhood adults and children. Child-centered informal social control pertains to whether adults in the neighborhood will intervene if they see a child misbehaving. Finally, reciprocated exchange refers to the extent to which neighborhood adults can rely on each other for advice and support (Sampson et al. 1997, 1999).

Neighborhoods high in social capital may be more endowed with resources because residents trust one another and work together to fight cuts to services—such as recreational facilities or healthcare clinics. Neighbors can also work to maintain their neighborhoods against signs of neglect, destruction, or abandonment (Lamore et al. 2006) which can directly impact child emotional well-being (Cullen and Whiteford 2001; Evans 2003). Such cooperative action can also benefit neighborhood children indirectly by reducing social isolation, and supporting the mental health of their parents (Cattell 2001; Kesselring et al. 2012). When parents know one another they can transmit health promoting information, such as how to access health care, child care, and educational/recreational services, or how to cope with difficult child behaviors (Cullen and Whiteford 2001; Kao 2004; Kim 2008). More broadly, when adults know each other they can establish and enforce norms for neighborhood children (Sampson et al. 1999). Indeed, neighborhoods that are higher in informal social control are theorized to discourage maladaptive and antisocial behavior because neighbors are willing to intervene when they witness such behaviors (Sampson et al. 1997; Leventhal and Brooks-Gunn 2003).

Neighborhood disadvantage is often seen as a key community-level predictor of children's mental health. Neighborhoods ranked high on multiple indicators of socioeconomic disadvantage serve as particularly risky environments for the physical, cognitive, and socioemotional development of children and adolescents (Acevedo-Garcia et al. 2008, Bradley and Corwyn 2002; Goodnight et al. 2012). Disadvantaged neighborhoods lack critical resources—such as grocery stores, excellent public schools, and recreational facilities that promote quality of life and the well-being of children (Acevedo-Garcia et al. 2008; Leventhal and Brooks-Gunn 2000; Pachter et al. 2006). Instead, they are more often characterized by endemic poverty, single parent householdship, and physical signs of disorder such as vandalism, abandoned buildings, and gang activity (Aneshensel 2009). These elements function as chronic stressors, create fear, and signal that the formal and informal sources of social control have broken down (Aneshensel 2009; Evans-Polce et al. 2013; Kruger et al. 2007; Wandersman and Nation 1998). Further, residents of disadvantaged neighborhoods are more often the victims of crime and are more likely to be exposed to traumatic or stressful

events compared to residents of more advantaged neighborhoods (Aneshensel et al. 1991; Kessler and Cleary 1980).

For children, this higher burden of exposure to stress and violence carries with it increased risk for the development of both internalizing and externalizing behavior problems (Aneshensel 2009; Evans 2004; Turner et al. 2006; Youngstrom et al. 2003). Although they often co-occur, internalizing and externalizing behavior are conceptually distinct: Internalizing includes anxious, depressive, or withdrawn behaviors and are thought to be an expression of over control or behavioral inhibition. While externalizing—aggressive, hyperactive, or noncompliant—behaviors are thought to be an expression of under control. While not all children or adolescents with behavior problems go on to have significant difficulties later in life, as a group, they are at greater risk for academic difficulties, delinquency or criminality, and mental health problems (Byrd et al. 2012; Holtmann et al. 2011; Timmermans et al. 2009).

Similarly, parents living in impoverished neighborhoods, often burdened by their own lack of economic resources, tend to be socially isolated from one another which increases their risk for mental health problems notably depression (Cutrona et al. 2006; Klebanov et al. 1994; Pachter et al. 2006; Ross 2000). Lack of neighborhood resources and social isolation deprives parents of the support of neighbors and community resources that are often useful in parenting efforts and reducing stress (Beber et al. 2008; Deng et al. 2006).

The impact of neighborhood disadvantage on the mental health of the child's mother is of particular concern because depression can impair parenting. Depressed mothers are frequently less warm, more distracted, and more inconsistent in their use of discipline than non-depressed mothers (Beck 1999; Paulson et al. 2006). Further, children of depressed mothers can develop internalizing problems as they mimic the mother's depressed behaviors including facial expressions, slowed motor movements, and negative self-appraisals (Beck 1999). Depression, and the associated functional impairment, can make it difficult for a mother to provide the emotional support and parenting that will shelter her child from the negative effects of poverty (Kiernan and Huerta 2008; Riley et al. 2009). Children with depressed mothers are at risk for a variety of difficulties with their social, emotional, and cognitive development (Brennan et al. 2000; Hammen and Brennan 2003; Shonkoff and Phillips 2000). However, not all children develop these difficulties. Is it possible that some children have access to extra familial neighborhood resources that are protective?

In this study we ask, how do family and neighborhood characteristics interact to influence child and adolescent behavior problems? Specifically, can access to high neighborhood social capital be protective for a child whose mother

is experiencing depressive symptoms? We examined these effects for children and adolescents separately to account for developmental changes in the prevalence and type of behavioral problems (Nagin and Tremblay 1999; Pingault et al. 2011) and the potential differential impact of neighborhood conditions across developmental stages (Osypuk 2013).

In addition to examining the effects of neighborhood socioeconomic disadvantage, neighborhood social capital, and maternal depression, we also include a number of key covariates in our analysis. We include children's gender and race because both have been shown to be related to the type and level of child behavior problems: Girls tend to have more internalizing behavior problems while boys have more externalizing behavior problems and some research suggests that racial/ethnic minority children are reported to have more behavior problems compared to White children (Briggs-Gowan et al. 2001; Gershon and Gershon 2002; Gray et al. 2004; Leadbeater et al. 1999). We also controlled for whether the child had been to a psychologist in the past year because children with behavior problems are more likely to be referred for mental healthcare (Koot and Verhulst 1992; Burns et al. 2004). For family characteristics, we accounted for parenting stress as well as indicators of socioeconomic status including family income and maternal education because lower family socioeconomic status has been shown to be associated with more child behavior problems (Bradley and Corwyn 2002). We also controlled for maternal marital status because previous research has shown that children from continuously married two parent families tend to have fewer behavior problems compared to children from families with divorced, cohabitating, or single parent homes (Amato 2005; Peterson and Zill 1986).

We hypothesized that maternal depression would be positively associated with both internalizing and externalizing behavior problems. We also predicted that greater neighborhood social capital would be associated with fewer child and adolescent behavior problems, while greater neighborhood socioeconomic disadvantage would be associated with more behavior problems. Finally, we hypothesized that social capital is as a protective resource, and moderates the association of maternal depression on the children and adolescent's behavior problems.

## Methods

### Data/Sample Design and Selection

We used data from the first wave of the Los Angeles Family and Neighborhood Survey (L.A. FANS). The data was

collected from April 2000 to January 2002. The survey was conducted in-person and sampled 3,085 households in 65 neighborhoods in Los Angeles County. It defined neighborhoods using the geographical boundary of a single census tract. The survey oversampled households with children under the age of 18 and households from impoverished (between the 60th and 89th percentiles of the poverty distribution based on the percent of residents with annual incomes below the poverty level) and very impoverished census tracts (top 10 % of poverty distribution). Census tract poverty estimates were based on data from the Los Angeles County Urban Research Division using state and county data from 1997. One adult household member served as the roster respondent and provided basic demographic information on all members of the household. Also, one adult and one child was selected at random and designated the randomly selected adult (RSA) and the randomly selected child (RSC), respectively. For each household with a RSC, the survey identified that child's primary caregiver. In the majority of cases the primary caregiver is the child's mother except where the mother did not live in the household, or was not able to provide information on the child. In these cases, the primary caregiver was the adult household member who indicated that he or she was primarily responsible for caring for the child (Peterson et al. 2004). In our sample, 95 % of caregivers were the biological or adoptive mother of the child. Another 2 % were grandmothers, 1 % step or foster mothers, 1 % aunts, and 1 % other female relatives. However, for ease of reading, we call all female primary caregivers "mothers." Analyses excluding the 5 % of caregivers who were not biological or adoptive mothers did not significantly change our results (not shown).

In addition to the data from the L.A. FANS, we also used data from the Los Angeles Neighborhood Services and Characteristics Database (L.A. NSC) which was developed for use with the L.A. FANS. The data in the L.A. NSC is gathered from a variety of sources including the US Census, California Association of Realtors, and InfoUSA (Peterson et al. 2007).

### Participants

We used two analytic samples for the current study. The first sample is the 2,619 RSAs who were administered the items used to rate each neighborhood's level of social capital. We excluded 25 adults who were missing data for all the items included in the social capital variable, resulting in a final sample of 2,594 individuals. The second sample is the individual level analytic sample of children. We selected children between the age of 5 and 17 whose primary caregiver was female, since there were so few males ( $n = 50$ , less than 3 % of all the primary caregivers surveyed). This resulted in an analytic sample of 1,305 children. These two samples are

partially independent in that only 27 % of the RSAs in the first sample also had children in the second sample.

## Measures

### *Child Behavior Problems*

Mothers reported on their child's behavior problems in the previous month using the Behavioral Problems Index (Peterson and Zill 1986). This measure consists of 28 questions answered using a 3-point Likert scale. Both internalizing (depressive and anxious) and externalizing (aggressive, hyperactive, and oppositional) behavior subscale scores were provided in the dataset.

### Neighborhood Predictors

#### *Residential Stability*

The indicator of neighborhood stability was the percent of people in the census tract who resided in the same home in 1995 as in 2000.

#### *Neighborhood Socioeconomic Disadvantage*

The L.A. NSC dataset included a factor score that estimated socioeconomic disadvantage developed from six indicators: (1) the percent of the population in poverty, (2) the percent of families with an annual income less than \$24,000, (3) the percent of households headed by females with children, (4) the percent of households receiving public assistance, (5) the percent of the population that is non-White and non-Asian and Pacific Islander, and (6) the percent of the population under 18. Higher scores indicate a more disadvantaged neighborhood.

#### *Social Capital*

We created a factor score for social capital using data from the RSAs in the L.A. FANS. Each RSA responded to 16 items that assessed the aspects of social capital: social cohesion, intergenerational closure, informal social control, and reciprocated exchange. These items were developed by Sampson et al. (1997, 1999). We hypothesized that social capital would have a second order factor structure with the four aspects of social capital as the first order indicators of the second order social capital factor. Based on this hypothesis, we performed a confirmatory factor analysis to produce a factor score for each adult respondent, and then aggregated these factor scores to the census tract to produce a measure of mean neighborhood social capital. The confirmatory factor analysis showed support for the proposed model: comparative fit index (CFI) = 0.92, and root mean square error (RMSEA) = 0.04.

## Individual, Maternal, and Family Predictors

### *Child, Mother, and Family Demographic Information*

We included in the analysis information on the child's age, gender, and race/ethnicity. We also accounted for the mother's age, gender, race/ethnicity, and marital status, as well as household income. We present this demographic information in Table 1.

#### *Visited a Psychologist*

The mother reported on whether or not the child had visited a psychologist in the past 12 months.

#### *Parenting Stress*

The mother responded to five items about her parenting stress scored on a 5-point Likert scale. An example item is: "I feel trapped by parental responsibility." We created a

**Table 1** Distribution of child and adolescent sociodemographic characteristics, Los Angeles Family and Neighborhood Survey, Wave 1, 2000–2001

	Children (N = 741)	Adolescents (N = 564)
Age	Mean = 7.93 (SD = 1.87)	Mean = 14.43 (SD = 1.67)
Race/ethnicity		
Latino	51.74 %	48.48 %
White	21.66 %	25.96 %
Asian/Pacific Islander	11.69 %	12.24 %
Black/African American	12.38 %	12.11 %
Native American	2.54 %	1.25 %
Family income	Mean = \$56,208.64 (SD = \$103,784.10)	Mean = \$58,982.66 (SD = \$80,589.23)
Maternal age	35.88 (SD = 7.28)	41.85 (SD = 7.39)
Maternal education		
<high school	36.91 %	31.95 %
High school graduate/ GED	19.62 %	21.21 %
Some/completed vocational school	28.45 %	24.72 %
≥Some college	15.02 %	22.12 %
Maternal marital status		
Married	64.41 %	66.21 %
Cohabiting	12.94 %	8.05 %
Separated/divorced/ widowed	11.48 %	17.90 %
Never married	11.17 %	7.84 %

Percentages may not sum to 100 because of rounding

summed score such that higher scores indicate greater reported stress (Cronbach  $\alpha = 0.7$ ).

### Maternal Depression

The L.A. FANS assessed depression in the previous 12 months using the Composite International Diagnostic Interview Short Form (CIDI-SF) (Kessler et al. 1998). The measure produces a probability-of-caseness score that ranges from 0.0 to 1.0. The closer the score is to 1 the greater the probability that a participant would meet diagnostic criteria for a major depressive episode if she had been administered the full CIDI interview.

## Procedure

### Data Analysis Strategy

We used Mplus version 5.1 (Muthén and Muthén 1998–2007) to estimate two-level hierarchical linear regression models. There was between 0 and 4.5 % missing data for all of the variables included in the study and missing data was imputed using maximum likelihood estimation. Further, we estimated models using robust standard errors. We first estimated null models and calculated the intraclass correlation coefficient (ICC) and the model design effect (DEFF). DEFF values greater than 2 suggest that the data should be modeled using multiple levels (Muthén 1999). For internalizing behavior problems, the ICC was 0.12, indicating that approximately 12 % of the variance in internalizing behavior problems was attributable to neighborhood level factors. The DEFF for internalizing behavior problems was 3. For externalizing behavior problems, approximately 4 % of the variance was due to neighborhood level factors and the DEFF was 2.

## Results

### Maternal Depression, Parenting Stress, and Child and Adolescent Behaviors Problems

We conducted a first set of multilevel regression analyses to examine the main effects of the predictors and covariates on both internalizing and externalizing behaviors. We present the results of these analyses separately for children age 5–11 and adolescents age 12–17 as shown in Tables 2 and 3 respectively. Female children were rated by their mothers as having fewer externalizing symptoms compared to male children ( $b = -0.88, p < .05$ ). White children ( $b = -0.13,$

$p < .01$ ) and Asian/Pacific Islander children ( $b = -0.97, p < .05$ ) were rated as having fewer internalizing symptoms as compared to Latino children, while Black children were rated as having more externalizing symptoms compared to Latinos ( $b = 1.91, p < .05$ ). Having seen a psychologist in the previous year was associated with both more internalizing ( $b = 1.5, p < .05$ ) and externalizing ( $b = 4.05, p < .01$ ) symptoms. Further, children of mothers who reported more parenting related stress also had higher ratings for both internalizing ( $b = 0.15, p < .01$ ) and externalizing behavior problems ( $b = 0.44, p < .01$ ). Finally, children of mothers who reported more depressive symptoms, had higher ratings of internalizing ( $b = 2.12, p < .01$ ) and externalizing problems ( $b = 3.2, p < .01$ ).

For adolescents, age 12–17, mothers judged females as having more internalizing behavior problems compared to males ( $b = 0.61, p < .05$ ). In addition, White ( $b = -1.45, p < .01$ ), Black ( $b = -1.31, p < .05$ ), and Native American ( $b = -1.66, p < .05$ ) adolescents were rated as having fewer internalizing problems compared to Latino adolescents. Native American adolescents were also rated as having fewer externalizing behavior problems than Latinos ( $b = -0.6, p < .05$ ). Seeing a psychologist was positively associated with externalizing behavior problems ( $b = 3.64, p < .01$ ). Similar to younger children, both the mother's parenting related stress and depression were associated with the mother's report of adolescent behavior problems. Parenting related stress predicted greater perceived internalizing ( $b = 0.21, p < .01$ ) and externalizing behavior problems ( $b = 0.58, p < .01$ ) in adolescents. Maternal depressive symptoms was also associated with more internalizing ( $b = 2.18, p < .01$ ) and externalizing behaviors ( $b = 3.17, p < .01$ ). We present the results of this analysis in Table 3.

### Social Capital, Disadvantaged Neighborhoods and Behavior Problems

Living in more disadvantaged neighborhoods was associated with more internalizing ( $b = 0.56, p < .01$ ) and externalizing behavior problems ( $b = 0.7, p < .05$ ) for children. However, neither social capital nor residential stability was a significant predictor of child behavior problems (Table 2).

For adolescents, neighborhood economic disadvantage was significantly and positively associated with internalizing behavior problems ( $b = 0.41, p < .05$ ). As was true for children, among adolescents neither social capital nor residential stability was associated with behavior problems (Table 3).

**Table 2** Two-level hierarchical linear models predicting internalizing and externalizing behavior problems for children age 5–11, Los Angeles Family and Neighborhood Survey, Wave 1, 2000–2001, N = 741

	Internalizing b (SE)	Externalizing b (SE)	Internalizing b (SE)	Externalizing b (SE)
Child's characteristics				
Sex (ref male)				
Female	−0.03 (0.21)	−0.88 (0.44)*	−0.08 (0.2)	−0.9 (0.4)*
Race/ethnicity (ref Latino)				
White	−1.13 (0.36)**	0.04 (0.84)	−1.11 (0.36)**	0.17 (0.85)
Asian/Pacific Islander	−0.97 (0.38)*	−0.82 (0.62)	−0.89 (0.42)*	−0.5 (0.61)
Black/African American	−0.77 (0.5) <sup>±</sup>	1.91 (0.82)*	−0.74 (0.45)	2.12 (0.83)*
Native American	0.81 (2.08)	0.35 (1.67)	0.78 (1.99)	0.47 (1.64)
Seen psychologist (ref no)				
Yes	1.5 (0.74)*	4.05 (1.4)**	1.5 (0.78) <sup>±</sup>	4.27(1.46)**
Family/maternal characteristics				
Family income	−0.15 (0.12)	0.23 (0.2)	−0.18 (0.12)	0.16 (0.21)
Maternal age	0.03 (0.03)	0.02 (0.04)	0.03 (0.02)	0.01 (0.04)
Marital status (ref never married)				
Married	0.03 (0.47)	0.06 (0.7)	−0.01 (0.46)	0.09 (0.72)
Cohabiting	1.08 (0.58) <sup>±</sup>	0.64 (0.85)	1.18 (0.59)*	0.95 (0.87)
Separated/divorced/widowed	0.19 (0.54)	0.02 (0.86)	0.15 (0.53)	0.08 (0.82)
Parenting related stress	0.15 (0.05)**	0.44 (0.08)**	0.15 (0.05) **	0.41 (0.08)**
Maternal depression	2.12 (0.57)**	3.2 (1.02)**	1.91 (0.56) **	3.54(1.12)**
Neighborhood characteristics				
Residential stability	−0.33 (1.33)	−0.24 (2.6)	−0.41 (1.4)	−0.22 (2.5)
Concentrated disadvantage	0.56 (0.15)**	0.7 (0.3)*	0.61 (0.14)**	0.75 (0.29)**
Social capital	0.2 (0.8)	0.91 (1.4)	0.39 (0.75)	1.14 (1.36)
Cross-level interaction				
Social capital × caregiver depression	−	−	−1.28 (2.25)	0.12 (3.9)

<sup>±</sup>  $p < .1$ ; \*  $p < .05$ ; \*\*  $p < .01$ 

### Interaction of Maternal Caregiver Depression and Neighborhood Social Capital

We conducted a final set of analyses that included the cross-level interaction of maternal depression with neighborhood social capital as a predictor. For the younger children, the interaction was not a significant predictor of behavior problems. However, for adolescents, the interaction was a significant predictor of internalizing and externalizing behavior: Living in neighborhoods with greater social capital attenuated the association of maternal depression with internalizing ( $b = -4.23$ ,  $p < .01$ ) and externalizing behavior problems ( $b = -5.08$ ,  $p < .05$ ). We present the results of this analysis in Table 3 and in Fig. 1.

### Discussion

Understanding the complex etiology of child behavioral problems helps us better target resources and interventions to

reduce the development of, and protect against, the negative sequelae of behavior problems. While we know that neighborhoods (Kohen et al. 2008; Leventhal and Brooks-Gunn 2000; Xue et al. 2005) and parents (Cummings and Davies 1994; Olfson et al. 2003) separately influence children's behavior, what this paper does is provide new evidence of how the relationships among maternal mental health and neighborhoods characteristics, particularly social capital, interact to influence behavior problems.

We found that for adolescents who lived in high social capital neighborhoods the association between maternal depression and behavior problems was attenuated. The fact that we found no direct impact of social capital, but instead only that social capital moderates the association of maternal depression with adolescent behavior problems represents one of the major contributions of this work. This finding suggests that social capital may be most important for adolescents who are faced with stressors within the family context, such as when one parent is depressed. For those adolescents whose parents are impaired, the presence

**Table 3** Two-level hierarchical linear models predicting internalizing and externalizing behavior problems for adolescents age 12–17, Los Angeles Family and Neighborhood Survey, Wave 1, 2000–2001, N = 564

	Internalizing b (SE)	Externalizing b (SE)	Internalizing b (SE)	Externalizing b (SE)
Child's characteristics				
Sex (ref male)				
Female	0.61 (0.31)*	0.15 (0.52)	0.58 (0.3) <sup>±</sup>	0.18 (0.51)
Race/ethnicity (ref Latino)				
White	−1.45 (0.4)**	−0.58 (0.77)	−1.38 (0.41)**	−0.6 (0.73)
Asian/Pacific Islander	−0.69 (0.62)	−1.74 (1.05) <sup>±</sup>	−0.77 (0.63)*	−1.8 (1.05) <sup>±</sup>
Black/African American	−1.31 (0.53) *	−0.16 (0.91)	−1.25 (0.52)	−0.15 (0.9)
Native American	−1.66 (0.6)*	−3.6 (1.2)**	−1.5 (0.65)*	−3.71 (1.26)**
Seen psychologist (ref no)				
Yes	1.4 (0.77) <sup>±</sup>	3.64 (1.29)**	1.38 (0.76) <sup>±</sup>	3.57 (1.26)**
Family/maternal characteristics				
Family income	−0.39 (0.14)**	−0.18 (0.35)	−0.36 (0.14)*	−0.11 (0.35)
Maternal age	−0.03 (0.02)	−0.05 (0.05)	−0.03 (0.02)	−0.05 (0.05)
Marital status (ref never married)				
Married	−0.13(0.51)	−0.54 (0.88)	−0.07 (0.5)	−0.52 (0.83)
Cohabiting	0.69 (0.74)	3.13(1.6)*	0.65 (0.7)	3.25 (1.57)*
Separated/divorced/widowed	−0.07 (0.58)	0.21(1.11)	−0.06 (0.59)	0.22 (1.08)
Parenting related stress	0.21 (0.05)**	0.58 (0.09)**	0.22 (0.05)**	0.59 (0.08)**
Maternal depression	2.18 (0.52)**	3.17 (0.89)**	2.35 (0.51)**	3 (0.94)**
Neighborhood characteristics				
Residential stability	−0.79 (1.55)	−0.17 (3.66)	−0.8 (1.45)	−0.24 (3.45)
Concentrated disadvantage	0.41 (0.21)*	−0.03 (0.44)	0.46 (0.2)*	0.01 (0.44)
Social capital	0.51 (0.87)	−0.3 (2.01)	0.69 (0.85)	−0.22 (1.99)
Cross-level interaction				
Social capital × caregiver depression	−	−	−4.23 (1.28)**	−5.08 (2.52)*

<sup>±</sup>  $p < .1$ ; \*  $p < .05$ ; \*\*  $p < .01$ 

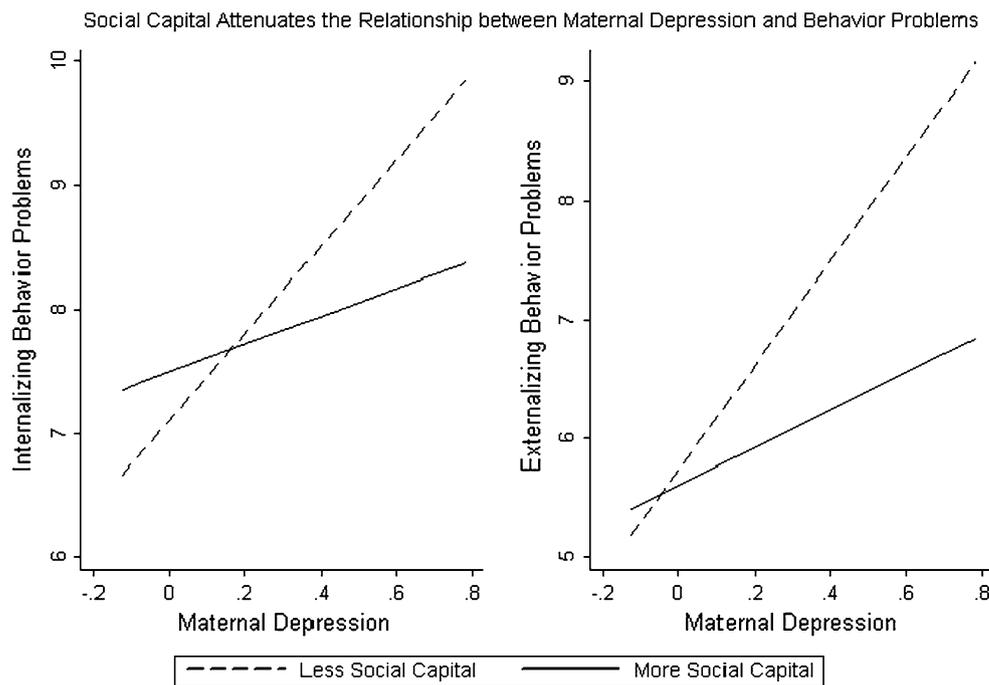
of protective factors outside of the family may become particularly salient (Portes 1998). Living in a neighborhood with higher social capital allows the adolescent to look outside the family for support and to access resources. Important resources include non-familial adult role models or pro-social peer groups that promote positive behavioral outcomes (Lenzi et al. 2012; Mattis et al. 2009; Stanton-Salazar 2011; Wandersman and Nation 1998). Furthermore, as this finding suggests, a fruitful area for future research is the development and evaluation of interventions intended to enhance neighborhood social processes. Research that focuses only on direct effects overlooks potential opportunities to intervene at multiple levels and mitigate the negative consequences of family or neighborhood socioeconomic disadvantage by targeting the potentially malleable factor of neighborhood social capital.

At the neighborhood level, our hypothesis that economic disadvantage was associated with behavior problems was partially supported. We demonstrated that children living in economically disadvantaged neighborhoods had more

internalizing and externalizing symptoms and adolescents had more internalizing symptoms compared to individuals who lived in more advantaged neighborhoods. The factors that influence behavior change as children age. It is possible that for adolescents other, unmeasured aspects of living in disadvantaged neighborhoods (e.g. exposure to deviant peers groups, neighborhood violence) are more closely associated with externalizing behaviors than indicators of economic deprivation.

Confirming our individual level hypothesis, we found that children and adolescents of mothers who reported more depressive symptoms had more behavior problems compared to children of less depressed mothers. The same is true for mothers who reported more parenting related stress. Our findings are consistent with previous studies that demonstrate that children of depressed parents are at higher risk for the development of behavior problems (Beeber et al. 2008; Brennan et al. 2000). Unfortunately, these early behavior problems can often translate into later academic underachievement, difficulty with interpersonal

**Fig. 1** Graph of the interaction of maternal depression and neighborhood level social capital predicting adolescent internalizing and externalizing behavior problems. For adolescents living in neighborhoods with more social capital, the association between parental depression and both internalizing and externalizing behavior problems is attenuated



relationships, higher levels of aggression, and psychopathology (Shonkoff and Phillips 2000).

Also, although we did not advance any hypotheses about these relationships, our results indicate racial/ethnic differences in behavior problems. For children, Whites and Asian Americans displayed fewer internalizing behaviors compared to Latino children, while Black children have more externalizing behaviors compared to Latinos. For adolescents, Whites and Blacks had fewer internalizing behaviors and Native Americans had fewer internalizing and externalizing behaviors compared to Latino adolescents. These results may reflect racial/ethnic differences in the rate of behavior problems, or racial/ethnic differences in parental ratings of behavior problems.

There are limitations to this study that are worth noting. First, the cross-sectional design precludes us from making causal inferences about the relationship between neighborhood or family characteristics and behavior problems. For example, we are not able to say whether having a mother with depressed mood causes child behavior problems, or if mothers whose children are more challenging are more likely to develop depression. Second, we cannot rule out the possibility that omitted variables, such as school quality, or the availability of mental health services, could account for the relationship between neighborhood conditions and behavior problems. However, to mitigate this concern, we controlled for multiple individual and family characteristics including income, race, and maternal marital status. Another limitation is that mothers reported on both their own symptoms of depression and their child's behavior problems. Some research suggests that depressed

mothers may over report behavior problems in their children, which would lead to an overestimation of the association between maternal depression and child behavior problems (Najman et al. 2001). The current study was also limited by the unavailability of robust indicators of parental mental health other than maternal depression. Future research would advance the field by examining the impact of other disorders, including anxiety or substance use disorders, and the impact of paternal mental health.

Despite these limitations, this study makes a significant contribution by identifying the ways in which the influence of neighborhood characteristics is moderated by family characteristics. Another strength is that we used a partially independent sample of adults to rate community social capital. This approach reduces potential reporting bias that might occur if mothers were the sole raters of both social capital and behavior problems. Also, we investigated adolescent and child outcomes separately. This is important because behavior problems are expressed differently in childhood and adolescence, while a child with internalizing behaviors might be too shy to talk; an adolescent might avoid social situations. Furthermore, the trajectories and later outcomes of behavior problems vary not only by the type of behavior problem, but also the age of onset. For instance, depressive/anxious symptoms tend to remain stable or decrease for boys and increase for girls throughout childhood and adolescence. On the other hand, most externalizing behaviors decrease from childhood through adolescence with one exception being delinquent behaviors which increase and peak during adolescence (Bongers et al. 2003). Furthermore, individuals whose

delinquent behaviors begin in childhood and then persist fare worse on adult mental health and psychosocial outcomes compared to individuals whose delinquency begins during adolescence (Moffitt et al. 2002).

Therefore, employing a life course perspective is an important step in better understanding how the effects of neighborhood conditions vary across developmental stages (Osypuk 2013). The impact that neighborhoods have on children and adolescents may differ because as children grow older they are increasingly likely to be directly impacted by their surroundings as they spend more unsupervised time in the neighborhood. Adolescents in particular may be influenced by peers, adults, and neighborhood institutions independent of the adolescent's family (Wickrama and Bryant 2003). However, focusing only on adolescents minimizes the very real influence that neighborhoods can have on younger children. Indeed, younger children are often less able than adolescents to venture outside of their neighborhoods alone. Therefore, children are likely to be impacted by neighborhood contexts either directly, or indirectly, as transmitted by their family members. Moreover, the length of children's exposure, from childhood through adolescence, to detrimental factors is significant as research has shown the negative consequences of cumulative exposure (Appleyard et al. 2005; Coie et al. 1993; McCord et al. 2001). Future research would benefit from a longitudinal design to better understand this cumulative effect.

This work highlights that effective interventions to address the mental health needs of children and adolescents must not only target the individual child and his or her family, but also the broader environmental context. Though we have effective behavioral health interventions targeted at individuals and families, the presence of risk and protective factors for health outcomes at the community level underscores the importance of adopting community level interventions. Certainly, the more widespread the availability of services such as counseling, and resources including jobs, transportation, quality schools and child care, the greater the likelihood of promoting the wellbeing of parents and their children (Macintyre et al. 2002). Given the scope of the problems observed in disadvantaged communities, neighborhood-level interventions may be an efficient means of addressing these ills. Further, in a nation in which 22 % of our children live below the poverty level (US Census Bureau 2011), interventions which reduce economic inequality and capitalize on the social resources available to children through their communities and extended networks are essential public health tools.

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