

# The Effect of Residential Neighborhood on Child Behavior Problems in First Grade

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**Abstract** Child behavior problems have been identified as being responsible for the greatest reduction in quality of life for children between ages 1 and 19. In this study, we examine whether neighborhood social processes are associated with differences in child behavior problems in an economically and racially diverse sample of 405 urban-dwelling first grade children and whether parenting behavior mediates and/or moderates the effects of neighborhoods. Furthermore, we examine whether neighborhood social processes play the same role with regards to child behavior problems at differing levels of neighborhood economic impoverishment. Results of multivariate multi-level regression analyses indicate that a high negative social climate is associated with greater internalizing problems. High potential for community involvement for children in the neighborhood was associated with fewer behavior problems, but only in economically impoverished neighborhoods. Differences in parenting behavior did not appear to mediate neighborhood effects on behavior problems, and parenting characterized by a high degree of positive involvement was associated with fewer behavior problems in all types of neighborhoods.

**Keywords** Neighborhood · Child behavior problems · Poverty

Child behavior problems have been identified as being responsible for the greatest reduction in quality of life for children between ages 1 and 19 (U.S. Public Health Service 2000). Children with behavior problems are more likely to experience academic failure, more likely to drop out of school, more likely to become involved in delinquent behavior as adolescents, and less likely to become productive members of society once they reach adulthood (U.S. Public Health Service 2000). Furthermore, there is evidence that behavior problems early in life are predictive of problems later on (Brody et al. 2003; Crick 1996; Lipman et al. 1998; Pettit et al. 1997).

Dodge and Pettit (2003) provide a summary of the literature regarding risk factors for chronic conduct disorders. Parenting that is characterized by low warmth, rejection of the child, and harsh/inconsistent discipline is also associated with higher rates of behavior problems (Conger et al. 1994; Criss et al. 2002; Dodge et al. 1994; Hill et al. 2003; Pettit et al. 1997). Early experiences of harsh discipline which have reached the extreme of child maltreatment is an especially potent predictor of child behavior problems (Dodge et al. 1990; Keiley et al. 2001).

## Neighborhood Effects on Child Behavior Problems

Despite ample evidence of the importance of family processes for the development of child behavior problems, there has been insufficient attention given to the broader contextual factors which may both shape these family processes and/or moderate the association between family

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processes and child behavior. Simons and his colleagues contend that any theory linking parenting with child outcomes is conceptually incomplete without the consideration of the effects of community context (Simons et al. 1997). This assertion takes on added significance given ample documentation of accelerated rates of urban poverty coupled with heightened isolation of poor communities that has occurred in the U.S. over the last several decades (Jargowsky 1997; Wilson 1987). The characteristics of the neighborhoods in which children reside are associated with differences in child behavioral and emotional problems, over and above differences in family and child characteristics (see Leventhal and Brooks-Gunn 2000 for a review).

Most studies of neighborhood effects on behavior problems have focused on adolescents (Beyers et al. 2003; Brooks-Gunn et al. 1993; Cheong and Raudenbush 2000; Dorsey and Forehand 2003; Paschall and Hubbard 1998; Simons et al. 1996; Tiet and Huizinga 2002) or older school-age children (Brody et al. 2001, 2003; Colder et al. 2000; Hill et al. 2003; Schwartz and Gorman 2003; Simons et al. 2002; Tolan et al. 2004). Only a few studies have examined neighborhood processes affecting behavior problems in children under the age of 7 (Brooks-Gunn et al. 1993; Caughy et al. 2003, 2004; Chase-Lansdale and Gordon 1996; Kohen et al. 2002; Silk et al. 2004; Xue et al. 2005). The earliest work in this area (Brooks-Gunn et al. 1993; Chase-Lansdale and Gordon 1996) was limited in terms of the types of neighborhood measures, with measures exclusively coming from the census such as proportion of affluent residents (Brooks-Gunn et al. 1993) and rates of male joblessness (Chase-Lansdale and Gordon 1996). Brooks-Gunn et al. (1993) found that child behavior problems among three-year-olds were higher in neighborhoods with a low proportion of adults employed in managerial/professional positions. Chase-Lansdale and Gordon (1996) found that child behavior problems in 5- to 6-year-old African American children were positively associated with male joblessness in the neighborhood. Although these findings are important in that they demonstrate the contribution of neighborhood context to child well-being over and above characteristics of children and families, a sole focus on neighborhood socioeconomic characteristics does not help us to understand the processes by which neighborhoods influence child well-being.

### Neighborhood Social Processes and Child Behavior Problems

More recent research on the effects of neighborhoods on the behavioral and emotional well-being of young children has expanded the neighborhood characteristics examined to include measures of social processes at the neighborhood

level. Sampson (1992) proposed that collective efficacy at the neighborhood level, which he defines as “linkages of mutual trust and the shared willingness to intervene for the common good” of the community (p. 10), affects children by affecting social processes within the family. Sampson’s position is echoed in the qualitative work of Furstenberg (1993). In a qualitative study of adolescent outcomes in a diverse set of poor neighborhoods in Philadelphia, Furstenberg (1993) found that neighborhoods differed significantly in terms of the degree of social cohesion and collective socialization of children and that highly cohesive neighborhoods appeared to compensate for problems at the family level such as parental stress and/or family instability.

There are five reports in the literature of studies of neighborhood effects on the behavioral and emotional well-being of young children that include measures of neighborhood social characteristics (Caughy et al. 2003, 2004; Kohen et al. 2002; Silk et al. 2004; Xue et al. 2005), but only two of them (Silk et al. 2004; Xue et al. 2005) included samples of young school-age children. The studies by Caughy and colleagues and by Kohen were done with preschool-aged children, and their findings are described in more detail below. In a study of children in the first and second grade, Silk et al. (2004) found that neighborhood cohesion and involvement moderated the association between maternal hostility and child externalizing problems. Maternal hostility was associated with higher externalizing problems in low cohesion but not high cohesion neighborhoods. Xue et al. (2005) examined the influence of neighborhood characteristics on behavior problems in a sample of 5- to 11-year-old in Chicago and found that neighborhood collective efficacy mediated the association between concentrated economic disadvantage and internalizing problem behaviors.

In this study, we build upon this research by examining whether neighborhood social process characteristics are associated with differences in child behavior problems in a sample of urban-dwelling first grade children. Specifically, we address the following research questions. First we examine whether neighborhood community involvement with children and negative social climate affect child behavior problems over and above differences attributable to individual child and family characteristics. Further, we examine more closely the issue of effect moderation by examining by cross-level interactions (i.e., interactions between neighborhood and individual level factors) as well as interactions between neighborhood characteristics.

In this investigation, we focus on two neighborhood social processes: *neighborhood potential for community involvement with children*, which taps both social cohesion in the neighborhood as well as the willingness of adults in the neighborhood to engage in collective socialization of children, and *neighborhood negative social climate*, which

taps physical and social disorder and fear in the neighborhood. As conceptualized here, our measure of potential community involvement with children, or CIC for short, is similar to the community involvement processes that were laid out in the educational psychology literature by Nettles (1991). According to Nettles, community involvement processes consist of actions that organizations and individuals take to promote the intellectual and psychosocial development of children and youth. Such actions may be characterized at the neighborhood level as interactions among residents and other forms of social resources and informal instruction, for example, when adults are willing to stop misbehavior. By jointly measuring both the degree of connectedness or cohesion among community members as well as the likelihood of adult action on behalf of children in the community, our measure of potential community involvement for children pinpoints a community social process that may influence the development of child behavior problems.

We also focus on joint contributions of negative and positive social characteristics of neighborhoods. While negative structural characteristics of neighborhoods (e.g., poverty, crime) have received considerable attention in the literature, negative *social* characteristics (e.g., negative climate) have been less often studied as compared to positive social characteristics such as social cohesion with respect to behavioral and emotional outcomes in young children. Caughy et al. (2004) and Kohen et al. (2002) included measures of physical and social disorder and/or general negative climate, but these studies were with preschoolers. Kohen et al. (2002) did not find any association between observed physical and social disorder in the neighborhood and behavior problems in their Canadian sample of 4–5 year olds. In a sample of African American 3–4 year olds, Caughy et al. (2004) found that fear of victimization in the neighborhood moderated the association between parental responses to experiences of racism and child internalizing behavior problems such that in high fear neighborhoods only, parents who actively stood up to experiences of racism had children with lower levels of internalizing problems such as depression and anxiety.

Although the issue of cross-level interactions between neighborhood characteristics and parenting behavior is one that is gaining prominence in neighborhood studies, most of the research on these effects for behavioral and emotional outcomes are limited to older children (Brody et al. 2001, 2003; Simons et al. 2002) or preschoolers (Caughy et al. 2004; Kohen et al. 2002). Only Silk et al. (2004) examined cross-level interactions in a sample of young school age children and, as reported above, found that neighborhood involvement/social cohesion appeared to buffer the negative effects of maternal hostility. However, the Silk study was very small ( $N = 42$ ) and the measure of neighborhood involvement cohesion was based upon child report, which raises issues with

regards to interpretation of the results. In this study, we examine cross-level interactions between neighborhood and family factors as well as interactions between neighborhood characteristics in predicting child behavior problems in a large diverse sample of first grade children.

## Method

### Participants

Families with a child entering first grade in Fall 2002 were recruited from Baltimore City neighborhoods through door-to-door-canvassing, targeted mailing lists, and referrals from other participants. Neighborhoods were defined as census block groups and were stratified by average household wealth and racial composition to ensure representativeness of the sample. Residents who had lived in their current neighborhood for less than 6 months, and children with disabilities severe enough to keep them out of first grade were excluded from the sample. A total of 405 families participated in the study. Families were recruited from 163 different block groups, with the number of families per block group ranging from 1 to 14 (average 2.47). A home visit was completed during Fall/Winter 2002 and consisted of an interview with the primary caregiver and a developmental assessment of the first grader.

### Measures

Data collected during the home visit were based on an interview with the primary caregiver (hereafter referred to as the parent), a self-administered parent questionnaire, videotapes of parent/child interaction, and direct assessment of the child's cognitive functioning. The direct assessment data will not be presented in this report. Interview data included questions on parenting behavior, family demographic characteristics, neighborhood characteristics, and child behavior problems. Family demographic characteristics included parent education, parent employment status, family size and structure and family income. Family size and income data were used to estimate a family income-to-needs ratio based on federal poverty guidelines.

*Parenting behavior* was assessed via self-report as well and via direct observation. The self report parenting measure was the Survey Measure of Mother–Child Relationship for Middle Childhood (SMMCRMC) (Mariner et al. 1998). For this analysis, we utilized two subscales from the SMMCRMC as indicators of positive parent involvement: *Eliciting* and *Expression of Affection*. The internal reliability coefficients of these subscales were .64 and .60, respectively. Because of the low internal reliability, the Expression of Affection subscale was dropped from the analysis.

*Harsh Parental Discipline* was assessed using a measure developed by Shumow et al. (1998). This is a 30 item measure of parenting style which is comprised of three subscales. Only the harsh discipline subscale, consisting of five items, was used in this analysis. The internal reliability of the harsh discipline subscale in this sample was .64.

Measures of *Connectedness*, and *Hostility* within the parent–child relationship were captured during a videotaped session during the home visit. Modeled largely after a study by Clark and Ladd (2000), the video-taped session included seven conversational tasks (episodes) initiated by the interviewer. The parent and child sat together, and in the first episode the parent was asked to tell a story of when the child was born or when the child was a small baby. The purpose of this episode was to elicit a narrative that was personally relevant to the child but for which he/she had no personal knowledge. The child then picked the topic of the next episode using a set of cards provided by the interviewer. In all, the child told six stories: something fun that happened at school, something not so fun that happened at school, something fun that happened at home, something not so fun that happened at home, something fun for the child that happened with the parent, and something not so fun for the child that happened with the parent. The parent was told that he/she could ‘help out’ in the story-telling.

Videotapes were reviewed and coded by two graduate student members of the research team, both of whom underwent training on videotape coding procedures. Training was not completed until interrater reliability was achieved. Estimates of interrater reliability were based on an intraclass correlation coefficient (ICC) which is recommended for continuously distributed outcomes (e.g., Shrout and Fleiss 1979). Initial interrater reliability based on joint rating of three tapes ranged from .83 to .96 for each story telling episode. About midway through coding, interrater reliability was checked again on a sample of three tapes and ranged from .87 to .98.

Each episode was coded for 14 items rated on five point Likert scales based on the coding system used by Clark and Ladd (2000). Episodes were deemed “unratable” if the episode lasted less than 30 s and included fewer than three interactive turns between the dyad. The number of ratable episodes per child ranged from 0 to 7 ( $M = 6.51$ ,  $SD = 1.06$ ). A total of 360 (89%) had at least five ratable episodes. Raters coded the following seven parent–child dyadic items and five parent behavior items were coded, each on a 5-point Likert scale. Detailed descriptions of these codes can be found in Clark and Ladd (2000). A measure of *Connectedness* consisted of the average of mutual positive engagement, mutual warmth/caring, reciprocity, mutual happy emotional tone, and mutual intimacy. The *Hostility* score was created by averaging parent–child anger, parent demandingness, and parent

hostility. All scale scores were first computed at the episode level and then averaged across episode. The internal reliability coefficients were .87, and .82 for *Connectedness*, and *Hostility*, respectively.

*Neighborhood variables* included measures of neighborhood concentrated economic disadvantage as well as measures of neighborhood social processes. *Concentrated economic disadvantage* was comprised of percent of individuals below poverty, percent receiving public assistance, percent unemployed, and percent of households that were female-headed with children (Sampson et al. 1997, 1999). All variables were drawn from the 2000 Census and standardized and averaged to create the concentrated economic disadvantage composite. Neighborhood social processes were measured using the seven subscales of the Neighborhood Environment for Children Rating Scales (NECRS) (Coulton et al. 1996). A confirmatory factor analysis supported a two factor structure for these seven subscales,  $\chi^2(15) = 22.18$ ,  $p = .054$ ,  $GFI = .97$ ,  $RMSEA = .055$ . The four subscales from the NECRS used as indicators of *neighborhood potential for community involvement with children* (CIC) included willingness of adults in the neighborhood to intervene in acts of delinquency, willingness to intervene in acts of child misbehavior, willingness to assist children in need, and level of social interaction in the neighborhood. These four scales were averaged to create a composite measure of CIC. Higher scores reflect a greater amount of potential for community involvement with children in the neighborhood. The individual-level internal reliability of this composite was .78. Using methods outlined by O’Brien (1990), reliability of the CIC measure at the neighborhood level was calculated as .95.

Three subscales of the NECRS were used as indicators of *neighborhood negative social climate* (NSC): perceived physical/social disorder, fear of retaliation, and fear of victimization. The *physical/social disorder* scale included 15 items reflecting frequency of neighborhood problems including trash, graffiti, abandoned cars, drug dealers, gangs, and loitering. *Fear of retaliation* was a 7 item scale reporting likelihood a child, teen, or adult would become angry and yell or retaliate if his/her behavior was corrected by someone else. *Fear of victimization* scale was a 14 item scale reporting how worried one is about being the victim of a property and/or personal crime. These three scales were averaged to create a composite measure of neighborhood negative social climate ( $\alpha = .76$ ). Higher scores on the NSC composite indicate a more negative social climate in the neighborhood. Neighborhood level reliability of the NSC composite was .98.

*Child behavioral competence* was measured using the Child Behavior Checklist (CBCL, Achenbach and Rescorla 2001). The CBCL yields scores for internalizing problems (e.g., anxiety, depression, withdrawal), externalizing problems (e.g.,

aggression), as well as a score for total problem behaviors. T-scores were used in this analysis. Higher scores reflect greater problem behaviors.

### Analysis Methods

We began by conducting exploratory analyses. We used correlations and *t*-tests to examine the bivariate associations between the child behavior problems measures and parenting behavior and neighborhood characteristics. We used these findings to inform our multivariate model building which was approached in a manner designed to best address the study questions which focused upon the contribution of neighborhood characteristics on child outcomes. In the first model, neighborhood variables were entered into the model while adjusting for parental education and family income-to-needs ratio. Controlling for these family-level socioeconomic measures was necessary in that the economic situation of a family is a major determinant of the kind of neighborhood in which a family can live. In the second model, we added the main effects of the parenting variables, and in the third model, we examined cross-level interactions between the parenting measures (i.e., eliciting, expression of affection, and connectedness) and neighborhood factors. In the fourth model, we examined interactions between neighborhood concentrated economic disadvantage and the neighborhood social process variables. In the final model, we included the individual-level covariates plus the main effects and interactions that were significant in the previous models.

Because the scales constructed from the parent/child videotapes are more reliable for those dyads where more episodes were available, multivariate analyses including variables derived from the observations were also adjusted for the number of ratable episodes obtained from the videotaped parent/child interaction episodes. All multivariate analyses were conducted using the XTREG procedure of Stata (StataCorp 2003). XTREG is a random effects procedure that adjusts for the correlations between observations that may be clustered, in this case, in the same neighborhood.

### Results

Demographic characteristics of the study sample are displayed in Table 1. Consistent with the racial composition of Baltimore City, the sample was predominantly African American followed by White/non-Hispanic. Of those participating primary caregivers as well as children who were classified as Hispanic or racially mixed, approximately half to two-thirds were at least partly African American. The majority (85%) of primary caregivers were mothers,

**Table 1** Characteristics of study sample (*N* = 405)

	<i>N</i>	%
<i>Race/ethnicity of the primary caregiver</i>		
White/non-Hispanic	134	33.1
Black/non-Hispanic	222	54.8
Hispanic	11	2.7
Asian or Pacific Islander	2	.5
America Indian	1	.2
Multi-racial	35	8.6
<i>Race/ethnicity of the child</i>		
White/non-Hispanic	123	30.4
Black/non-Hispanic	216	54.8
Hispanic	16	4.0
Asian or Pacific Islander	2	.5
America Indian	1	.2
Multi-racial	47	11.6
<i>Relationship to child</i>		
Mother	345	85.2
Father	27	6.7
Grandparent	19	4.7
Other relative	10	2.5
Non-relative	4	1.0
<i>Family structure</i>		
Nuclear	175	43.2
Single parent	131	32.3
Nuclear/extended	15	3.7
Single/extended	52	12.8
Other family/no parent present	22	5.4
Mother/boyfriend	6	1.5
Unrelated caregiver/no family present	4	1.0
<i>Poverty status</i>		
<50% poverty	76	18.8
51–99% poverty	74	18.3
100–179% poverty	84	20.7
180–334% poverty	73	18.0
335+% poverty	83	20.5
Missing	15	3.7
<i>Educational attainment</i>		
Less than high school	79	19.5
High school/GED	149	36.8
More than high school	175	43.2
Missing	2	0.5
<i>Employment status</i>		
Currently employed	234	57.8
Employed in last 5 years	105	25.9
Never employed	65	16.0
Missing	1	0.2
<i>Child gender</i>		
Boy	203	50.1
Girl	202	49.9

**Table 1** continued

	N	%
<i>No. of children &lt;17 in household</i>		
One	79	19.5
Two or three	212	52.3
Four or more	114	28.1

followed by fathers and grandparents. Although the nuclear family was the predominant family structure, many of the participating children were living with a single parent or a single parent plus other extended family. The study sample also was diverse in terms of socioeconomic status.

The intercorrelations of the study variables are displayed in Table 2. As expected, problem behaviors were higher in children whose parents did not engage in eliciting behavior, who displayed hostility toward their child during the videotaped interaction episode, and/or used harsh discipline practices. These parent characteristics were primarily associated with higher externalizing behavior problems. With regards to neighborhood characteristics, negative social climate (NSC) was associated by higher externalizing problems as well as internalizing problems.

We also explored the association between neighborhood characteristics and behavior problems using *t*-tests. In order to examine the possibility of threshold effects, we dichotomized neighborhood concentrated economic disadvantage, community involvement with children (CIC), and negative social climate into the highest quartile versus others. Means and standard deviations for total problems, internalizing problems, and externalizing problems for each category of economic impoverishment, CIC, and NSC are displayed in Table 3. Although CBCL scores did not differ significantly in high concentrated economic disadvantage neighborhoods, higher problem behavior scores were associated with low CIC and high NSC.

**Multivariate Analyses**

Multilevel regression was used to estimate the between-neighborhood variance in child behavior problems after adjusting for differences in individual-level covariates between neighborhoods. The between-neighborhood variance for CBCL Total problem behaviors was .115. For CBCL Internalizing problems, it was .143, and for CBCL Externalizing problems, it was .106. Based on the evidence of threshold effects revealed in the *t*-tests, neighborhood variables were dichotomized as high (top quartile) versus not high for the purposes of the multivariate analyses. For Total problem behaviors (see Table 4), there were no main effects for the neighborhood factors, and none of the cross-level interactions between the parenting variables and

**Table 2** Descriptive statistics and intercorrelations of study variables

	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Total behavior	Mean (SD)	49.94 (10.16)	24–82	1.00									
2. Internalizing behavior	49.13 (9.56)	33–79	.81**	1.00									
3. Externalizing behavior	50.71 (9.66)	33–83	.88**	.60**	1.00								
4. Eliciting	4.32 (.54)	2.20–5.00	-.30**	-.16**	-.26**	1.00							
6. Connectedness	2.88 (.56)	1.32–4.43	-.08	-.09	-.06	.12*	1.00						
7. Hostility	1.82 (.32)	1.05–3.57	.16**	.12*	.17**	-.07	-.17**	1.00					
8. Harsh discipline	2.38 (.44)	1.05–3.57	.11*	.02	.08	-.13*	-.24**	.11*	1.00				
9. Neigh. eco. disadv.	.01 (.78)	-1.21–3.01	.07	.06	.08	-.04	-.31**	.14*	.17**	1.00			
10. Neighborhood CIC	3.82 (.74)	1.05–5.00	-.07	-.05	-.02	.13*	.15**	-.12*	-.08	-.27**	1.00		
11. Neighborhood NSC	2.60 (.88)	1.07–4.86	.16**	.12*	.12*	-.06	-.20**	.12*	.18**	-.40**	1.00		
12. Income-to-needs ratio	196.46 (168.58)	6.44–769.23	-.12*	-.06	-.11*	.08	.35**	-.09	-.32**	-.40**	.25**	1.00	
13. Educational status <sup>a</sup>	2.24 (.76)	1–3	-.13*	-.01	-.14**	.07	.32**	-.08	-.37**	.10*	-.39**	.49**	1.00

<sup>a</sup> Spearman rho correlation

\* *p* < .05; \*\* *p* < .01

**Table 3** Differences in child behavior problems by neighborhood characteristics

	Low		High		<i>t</i>
	Mean	SD	Mean	SD	
<i>Neighborhood concentrated economic disadvantage</i>					
Total problems	49.52	9.72	51.24	11.39	1.35
Internalizing problems	48.80	9.27	50.18	10.40	1.25
Externalizing problems	50.26	9.32	52.14	10.58	1.69
<i>Neighborhood community involvement w/children (CIC)</i>					
Total problems	50.58	9.89	47.70	10.66	2.56**
Internalizing problems	49.58	9.68	47.79	9.19	1.62
Externalizing problems	51.26	9.46	49.08	9.96	1.97*
<i>Neighborhood negative social climate (NSC)</i>					
Total problems	49.02	10.12	52.44	10.04	2.89**
Internalizing problems	48.32	9.36	51.13	10.06	2.52*
Externalizing problems	50.09	9.48	52.30	10.03	1.96*

\*  $p < .05$ ; \*\*  $p < .01$

neighborhood factors were significant (not shown). In the final model for Total problem behaviors, parental eliciting behavior was associated with significantly lower problem behaviors, and observed parent/child hostility was associated with higher problems. There was also a significant gender affect, with girls having significantly lower total problem scores compared to boys. In the final model, the between-neighborhood variance in CBCL Total problem behaviors was relatively unchanged at .119.

Internalizing problem scores, representing problems such as anxiety and depression, were approximately three

points higher in neighborhoods with a highly negative social climate (see Table 5). There was also a significant gender affect, with girls having significantly lower internalizing problem scores compared to boys. In the second model, parenting variables were added, and although parent eliciting behavior was associated with significantly lower internalizing problems, the effect of high negative social climate in the neighborhood remained significant. Although there were no significant cross-level interactions between neighborhood factors and parenting variables (not shown), there was a significant interaction between neighborhood concentrated economic impoverishment and neighborhood CIC (see Model 3). In neighborhoods with a high degree of concentrated economic impoverishment, high neighborhood CIC was associated with an almost eight point lower CBCL internalizing score compared to economically impoverished neighborhoods with low CIC. This interaction retained its significance in the final model when parent eliciting behavior was added back into the model. In the final model for internalizing problems, the between-neighborhood variance was .104.

The main effects of neighborhood characteristics were not significant for externalizing problems (Table 6). There was a significant gender affect, with boys having significantly higher externalizing problem scores than girls. Although the main effect of parent eliciting behavior was significant, with greater eliciting associated with fewer externalizing problems, there were no significant cross-level interactions between neighborhood factors and parenting variables (not shown). There was, however, a significant interaction between high neighborhood concentrated economic

**Table 4** Multilevel regression of CBCL total behavior problems score on neighborhood characteristics and parenting behavior

	Neighborhood main effects		Parenting main effects		Neighborhood interactions		Final model	
	<i>b</i> (SE)	<i>z</i>	<i>b</i> (SE)	<i>z</i>	<i>b</i> (SE)	<i>z</i>	<i>b</i> (SE)	<i>z</i>
Child gender	−2.52 (1.04)	−2.43*	−2.12 (1.05)	−2.02*	−2.44 (1.04)	−2.35*	−2.08 (1.01)	−2.06*
Family income-to-needs	−.002 (.004)	−.51	−.002 (.004)	−.53	−.002 (.004)	−.66	−.003 (.004)	−.98
High neigh. conc. eco. disadv.	.23 (1.55)	.15	−.09 (1.62)	−.06	.90 (1.86)	.49	−	−
High neighborhood NSC	2.04 (1.32)	1.55	1.81 (1.33)	1.36	1.96 (1.61)	1.22	−	−
High neighborhood CIC	−2.23 (1.25)	−1.79 <sup>+</sup>	−1.60 (1.27)	−1.26	−1.35 (1.36)	−.99	−	−
Eliciting	−	−	−4.51 (1.02)	−4.43**	−	−	−5.27 (.96)	−5.50**
Connectedness	−	−	.80 (1.05)	0.76	−	−	−	−
Hostility	−	−	3.65 (1.68)	2.17*	−	−	3.98 (1.61)	2.47*
Harsh parental discipline	−	−	.53 (1.33)	.40	−	−	−	−
High conc. eco. dis. × high NSC	−	−	−	−	.27 (2.67)	.10	−	−
High conc. eco. dis. × high CIC	−	−	−	−	−5.61 (3.38)	−1.66 <sup>+</sup>	−	−
Constant	53.94 (1.64)	32.78**	60.17 (8.18)	7.36**	53.73 (1.65)	32.48**	64.20 (6.23)	10.30**
rho	.09		.12		.06		.12	

Note: CIC = potential for community involvement with children; NSC = negative social climate. All models are adjusted for parental education and the number of ratable episodes in the observational interview

<sup>+</sup>  $p < .10$ ; \*  $p < .05$ ; \*\*  $p < .01$

**Table 5** Multilevel regression of CBCL internalizing behavior problems score on neighborhood characteristics and parenting behavior

	Neighborhood main effects		Parenting main effects		Neighborhood interactions		Final model	
	<i>b</i> (SE)	<i>z</i>	<i>b</i> (SE)	<i>z</i>	<i>b</i> (SE)	<i>z</i>	<i>b</i> (SE)	<i>z</i>
Child gender	−2.20 (.98)	−2.23*	−1.82 (1.03)	−1.77 <sup>+</sup>	−2.08 (.98)	−2.12*	−2.09 (.97)	−2.15*
Family income-to-needs	−.001 (.003)	−.27	−.002 (.004)	−.55	−.002 (.003)	−.49	−.001 (.003)	−.36
High neigh. conc. eco. disadv.	.78 (1.54)	.51	.19 (1.68)	.11	1.64 (1.81)	.90	1.96 (1.56)	1.26
High neighborhood NSC	2.96 (1.26)	2.36*	3.27 (1.32)	2.47*	2.70 (1.54)	1.76 <sup>+</sup>	3.08 (1.24)	2.49*
High neighborhood CIC	−1.23 (1.19)	−1.04	−.68 (1.25)	−.54	.24 (1.29)	.02	.43 (1.28)	.33
Eliciting	–	–	−2.09 (1.00)	−2.08*	–	–	−2.48 (.93)	−2.67**
Connectedness	–	–	−.35 (1.03)	−.34	–	–	–	–
Hostility	–	–	2.32 (1.65)	1.41	–	–	–	–
Harsh parental discipline	–	–	−.60 (1.30)	−.46	–	–	–	–
High conc. eco. dis. × high NSC	–	–	–	–	.79 (2.53)	.31	–	–
High conc. eco. dis. × high CIC	–	–	–	–	−.79 (3.19)	−2.47*	−7.47 (3.16)	−2.36*
Constant	50.89 (1.57)	32.36**	53.56 (8.05)	6.65**	50.60 (1.58)	32.09**	60.44 (4.02)	15.02**
rho	.13		.18		.10		.11	

Note: CIC = potential for community involvement with children; NSC = negative social climate. All models are adjusted for parental education and the number of ratable episodes in the observational interview

<sup>+</sup>  $p < .10$ ; \*  $p < .05$ ; \*\*  $p < .01$

**Table 6** Multilevel regression of CBCL externalizing behavior problems score on neighborhood characteristics and parenting behavior

	Neighborhood main effects		Parenting main effects		Neighborhood interactions		Final model	
	<i>b</i> (SE)	<i>z</i>	<i>b</i> (SE)	<i>z</i>	<i>b</i> (SE)	<i>z</i>	<i>b</i> (SE)	<i>z</i>
Child gender	−2.78 (.98)	−2.83**	−2.60 (1.00)	−2.59**	−2.67 (.98)	−2.73**	−2.44 (.96)	−2.54*
Family income-to-needs	−.001 (.003)	−.15	−.000 (.004)	−.07	−.001 (.003)	−.34	−.001 (.003)	−.30
High neigh. conc. eco. disadv.	.92 (1.47)	.62	.68 (1.40)	.49	1.90 (1.77)	1.07	1.70 (1.44)	1.18
High neighborhood NSC	.90 (1.24)	.72	.16 (1.26)	.13	.89 (1.52)	.59	–	–
High neighborhood CIC	−1.45 (1.18)	−1.23	−1.09 (1.21)	−.90	−.31 (1.28)	−.24	.06 (1.25)	.04
Eliciting	–	–	−3.80 (.96)	−3.93**	–	–	−4.13 (.917)	−4.51**
Connectedness	–	–	.94 (1.00)	.94	–	–	–	–
Hostility	–	–	3.53 (1.61)	2.20*	–	–	3.40 (1.54)	2.21*
Harsh parental discipline	–	–	−.21 (1.26)	−.17	–	–	–	–
High conc. eco. dis. × high NSC	–	–	–	–	.01 (2.51)	.01	–	–
High conc. eco. dis. × high CIC	–	–	–	–	−7.24 (3.18)	−2.28*	−5.79 (3.23)	−1.79 <sup>+</sup>
Constant	54.83 (1.55)	35.29**	62.37 (7.78)	8.01**	54.53 (1.56)	34.95**	63.68 (5.87)	10.84**
rho	.10		.05		.08		.06	

Note: CIC = potential for community involvement with children; NSC = negative social climate. All models are adjusted for parental education and the number of ratable episodes in the observational interview

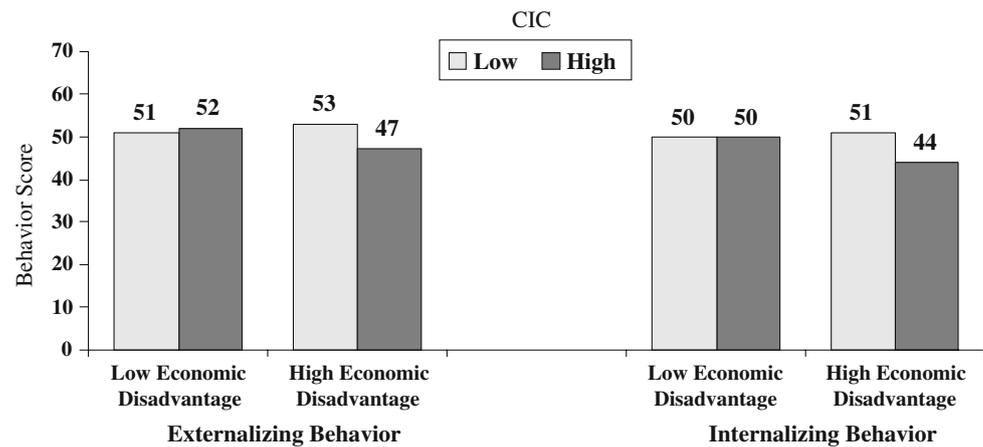
<sup>+</sup>  $p < .10$ ; \*  $p < .05$ ; \*\*  $p < .01$

disadvantage and high neighborhood CIC. Similar to internalizing problems, in neighborhoods with a high degree of concentrated economic impoverishment, high neighborhood CIC was associated with an approximately seven point lower CBCL externalizing score compared to economically impoverished neighborhoods with low CIC. In the final model, however, when parent eliciting and parent/child hostility were added back to the model, this interaction was no longer significant,  $b = -5.79$ ,  $SE = 3.23$ ,  $z = -1.79$ ,

$p = .07$ . In the final model for externalizing problems, the between-neighborhood variance was reduced to .064.

The interaction between high concentrated economic disadvantage and high CIC for internalizing problems is displayed in the Fig. 1. Neighborhood potential for involvement with children was associated with fewer behavior problems but only among children who were living in highly economically disadvantaged neighborhoods. Post hoc comparisons indicated that problem

**Fig. 1** Interaction between high potential for community involvement with children (CIC) and high neighborhood economic disadvantage



behavior scores for children living in poor neighborhoods with *low* CIC were significantly higher than those for children living in poor neighborhoods with *high* CIC. The problem behavior scores of children living in poor neighborhoods with high CIC were not significantly different from children living in non-poor neighborhoods.

## Discussion

The results of this study add to the growing evidence that child behavior problems are not only a function of processes at the individual and family level but are also influenced by characteristics of the neighborhoods in which children live. As in previous studies, we found that internalizing problems such as anxiety and depression differed significantly between neighborhoods even after adjusting for differences in family socioeconomic status. However, there were not many differences in the associations between parenting behavior and child behavior problems in different types of neighborhoods. In all neighborhoods, parenting characterized by observable hostility was associated with higher behavior problems, especially problems with aggression and acting out. Parenting characterized by eliciting (i.e., encouraging the child to express his opinion and taking the child's view into consideration) was associated with both lower internalizing and externalizing behavior problems in all neighborhoods.

Children who lived in neighborhoods with high degrees of physical and social disorder, fear of crime, and fear of retaliation had internalizing *t*-scores that averaged more than three points higher than children living in other neighborhoods. This represents about a third of a standard deviation, which would be considered a moderate effect size (Cohen 1988). We also found a significant interaction between neighborhood potential for community involvement with children and neighborhood concentrated economic

disadvantage. High CIC was associated with fewer behavior problems but only in highly economically disadvantaged neighborhoods. This would suggest that the sense of community in a neighborhood and likelihood of adult intervention on behalf of children takes on a different level of importance in the face of other risk factors associated with extreme poverty. Community involvement with children may provide a buffer against such risk in the form of other adults willing to engage in collective socialization. On the other hand, community involvement with children could be a marker for other things going on in the neighborhood such as higher social support in general. This in turn may spill over into lower levels of stress for adults and children in the neighborhood. Family stressors such as economic instability and low social support are more prevalent in poor neighborhoods resulting in increased maternal distress and compromised parent/child interaction (McLoyd 1998).

In the final model for externalizing problems, the significant interaction between high neighborhood concentrated economic disadvantage and high neighborhood CIC was reduced when parent eliciting and dyadic hostility was included. This would suggest that the impact of CIC in high poverty neighborhoods on child aggressive behavior may be mediated through parent/child interactions. In contrast, for CBCL internalizing behavior, including measures of quality of parenting did not reduce the significance of the interaction between high neighborhood concentrated economic disadvantage and high neighborhood CIC. Therefore, it would appear that parenting factors do not mediate the relation between CIC and internalizing problems for children living in high poverty neighborhoods. One possibility is that we did not include appropriate parenting mediators in the model. Another possibility may have more to do with resources that are available to children living in non-impovertished neighborhoods. For example, children living in non-economically disadvantaged neighborhoods are likely to have access to a range of services including after school and extracurricular

activities as well as improved access to behavioral health services to address any behavior concerns. As pointed out by Furstenberg (1993), it takes an extraordinarily motivated parent in a high concentrated economic disadvantaged neighborhood to access resources for her children where such effort is not as critical in a low impoverishment neighborhood. Yet another possibility is that high community involvement with children in an economically disadvantaged neighborhood may be a marker for higher levels of professional intervention and outreach in a variety of areas such as Head Start programs, pre-K programs in public schools, after-school programs, and/or comprehensive health centers.

These findings parallel those of Garbarino and Sherman (1980). In a qualitative investigation, these researchers compared two poor neighborhoods that differed in terms of their rates of reported child maltreatment. Their findings revealed that the most salient difference between the two neighborhoods was the degree of social cohesion. In the poor neighborhood with a lower rate of child maltreatment, Garbarino and Sherman (1980) found that there was a higher level of interpersonal exchange and, consequently, more adults were “free from drain” and available as a source of support in the neighborhood. More qualitative work is needed to fully understand the social processes that act as buffers for children in poor neighborhoods.

Although this research area is still young, the findings of this investigation add to a small and growing literature documenting the effects of neighborhoods on the developmental competence of children. This investigation is one of only three studies examining neighborhood effects on behavior problems among very young school age children. Although Xue et al. (2005) included children as young as age 5, they did not include any variables that assessed differences in family-level processes such as quality of parent/child interaction. Silk et al. (2004) did include such measures and found that maternal hostility based on mother report was associated with higher child externalizing problems among first and second graders in low neighborhood involvement/cohesion neighborhoods but not in high neighborhood involvement/cohesion neighborhoods. We did not find a similar association in our study. These differences may have resulted from the many methodological differences between the two studies. For example, the measure of neighborhood involvement/cohesion scale in the Silk study focused exclusively on the mother’s feelings of belongingness in the neighborhood and her participation in interpersonal exchange in the neighborhood. In contrast, our measure of neighborhood potential for community involvement with children included three subscales that were focused not on presence of social cohesion in the neighborhood but rather on perceived willingness of neighbors to supervise and assist children in

the neighborhood. Furthermore, the questions in our study used neighbors as the referent (i.e., “The people in my neighborhood loan things to one another”) while the questions in the Silk study used the respondent as the referent (i.e., “I would feel comfortable asking to borrow some food or a tool from people on my block”). Although these differences are subtle, they have important implications for understanding the neighborhood social processes being studied. Future neighborhood research must use more precise operational definitions of neighborhood social processes to facilitate our understanding of the mechanisms underlying neighborhood differences in child behavioral and emotional well-being.

There are limitations of the current analysis which must be kept in mind when interpreting the results. The most significant limitation is the cross-sectional nature of the measures. The neighborhood measures, the parenting measures, and the child outcome measures were all assessed contemporaneously. Therefore, conclusions regarding direction of causation should be made cautiously. For example, we found a strong association between parental hostility and child externalizing problems. Although the assumption is that parental hostility is the causal factor exacerbating child behavior problems, it is also quite possible that the direction of causation is in the opposite direction. Indeed, there is a significant amount of literature documenting the transactional relationship that results in the coercive cycle between parent and child, further escalating aggression and conduct problems in the child (Dodge et al. 1990; Dodge and Pettit 2003; Patterson et al. 1989).

Another limitation of the current investigation is the operational definition of “neighborhood.” In this study, we used census block groups to proxy neighborhoods. The advantage of block groups is they are more homogeneous than census tracts while still allowing the researcher to link individual data with administrative data such as the information from the census. However, census block groups may or may not be good approximations of what participants envision when they are asked about their neighborhoods. In addition, although we used multilevel modeling methods to account for clustering effects, even these methods represent an oversimplification of the complexity of contextual effects. For example, some poor neighborhoods are surrounded by other poor neighborhoods while some poor neighborhoods are surrounded by less economically impoverished areas. We did not model these relationships. Another complexity is the fact that children may spend time in residences or care settings in different parts of the city that may have very different ecological characteristics from the area where they reside. Although there are statistical methods for capturing some of these complexities (Goldstein et al. 2000), they are difficult to implement and have not been used in child

development research. Mixed methodologies, utilizing both quantitative as well as qualitative methodologies should be emphasized in future research in order to capture the dynamic developmental relations of the multiple environments affecting children's lives.

Another limitation of the current investigation is the small number of participating children per neighborhood. The average number of participants per neighborhood was about 2½, well below the recommended number of 30 needed in order to detect random slopes (Duncan and Raudenbush 1999). Specifying random slopes would be to allow the relation of individual level variables, such as parenting in this study, with child outcomes to vary according to neighborhood. For example, it may be that parental nurturance is more strongly associated with child competence in high poverty neighborhoods than in other neighborhoods, such as reported by Dearing (2004). The small number of participants per neighborhood limited our ability to detect such cross-level interactions.

Finally, more research is needed examining how neighborhoods foster or hinder child competence. All of the studies thus far have been focused on neighborhood effects on child behavior problems, most often using measures such as the CBCL. This is also the measure used in the current investigation. However, measuring behavior problems does not tap all domains of child functioning and competence. Future investigations should consider incorporating measures of child social competence and not only measures of child behavior problems.

Much of the early work on neighborhoods consisted of documenting differences in child outcomes that could not be explained by family-level processes and child characteristics. This study contributes to the literature by demonstrating that neighborhood effects on families and children are likely quite complex. Roosa et al. (2003) have proposed a “transactional” model of neighborhood influences on children by which individuals are not passive recipients of neighborhood influences. Rather, residents are “active cognizers and constructors of their environments”, and their responses to the neighborhood environment are a function of that transactional process. As stated by Roosa et al. “decisions and actions by individual families influence neighborhood processes, [and] in turn, neighborhood processes or families’ perceptions of them influence families’ decisions and actions” (p. 61). Future research must capitalize on innovative designs that can further explicate this transactional relationship between families and neighborhoods. As we have demonstrated in this report, neighborhood conditions have a measurable impact on child behavior problems. Incorporating a neighborhood focus in prevention research will be important for the development of effective interventions to improve behavioral and emotional well-being in children.

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