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Illuminating associations between parenting and deleterious neighborhood characteristics via exhaustive modeling

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Abstract

Objective: Our goal was to illuminate associations between specific characteristics of under-resourced neighborhoods (i.e., socioeconomic deprivation, danger) and specific aspects of parenting (e.g., parental praise, parental nurturance, harsh parenting, and parental control).

Background: Prior work has highlighted associations between level of neighborhood disadvantage and the parenting of its residents. However, this work has yet to clarify the specific characteristics of the neighborhood or the types of parenting involved.

Method: Exhaustive modeling analyses were conducted in a sample of 1030 families of twins (average age 8 years; 51% male, 49% female; the racial composition was 82% White, 10% Black, 1% Asian, 1% Indigenous, 6% multiracial) from the Twin Study of Behavioral and Emotional Development in Children. Neighborhood and parenting were assessed using multiple informants and assessment strategies (neighborhood informants, family informants, administrative data, and videotaped parent–child interactions).

Results: Neighborhood socioeconomic deprivation (i.e., limited institutional and economic structural resources) demonstrated small but consistent negative associations with positive parenting behaviors and maternal control, but not with negative parenting behaviors. Neighborhood danger (i.e., recorded crime, fear of crime, exposure to community violence), by contrast, demonstrated weaker associations with parenting that dissipated once we controlled for overlap with socioeconomic deprivation.

Conclusion: Danger and socioeconomic deprivation do not function as interchangeable characteristics of under-resourced neighborhoods, at least in terms of their association with positive parenting. Future studies should identify the specific mechanisms through which neighborhood socioeconomic deprivation is associated with less nurturing parenting.

KEYWORDS
neighborhoods, parenting, poverty, violence

INTRODUCTION

A growing body of empirical research (Klahr & Burt, 2014; Kotchick & Forehand, 2002; Luster & Okagaki, 2005) has sought to uncover the origins of parenting behavior, or why parents parent the way that they do. The theoretical core for much of this work has been Belsky's process model of the determinants of parenting (Belsky, 1984), which posited that parenting is a complex repertoire of behaviors determined by characteristics of the parent (e.g., personality, experiences with own caregiver), characteristics of the child (e.g., temperament), and the family context (e.g., the marital relationship). Key contextual factors in the family's ecological network, including family poverty and ethnicity/culture, were not included in Belsky's initial model but have been added in subsequent work (Kotchick & Forehand, 2002; Luster & Okagaki, 2005).

Consistent with this more modern conceptualization of the important role of contextual influences on parenting behavior, neighborhood characteristics have emerged as important correlates of parenting. One of the more commonly studied neighborhood characteristics in this literature is socioeconomic deprivation, or the limited institutional and economic structural resources in under-resourced neighborhoods (e.g. Cuellar et al., 2015; Leventhal & Brooks-Gunn, 2000). A systematic review of the topic (Cuellar et al., 2015), for example, concluded that residence in an under-resourced neighborhood undermined positive parenting. Relatedly, a housing relocation randomized control trial (Moving to Opportunity) found that moving to a low-poverty neighborhood reduced parental distress by 20% (Leventhal & Brooks-Gunn, 2003), an important finding in the context of the current study given that parental distress is a robust predictor of colder, harsher parenting (Conger et al., 1992). There is also evidence of associations between parenting and neighborhood danger (Choi et al., 2018; Cuartas, 2018; Cuellar et al., 2015), which is typically defined by the amount of recorded crime, residents' exposure to community violence, and/or the fear of crime among residents. Cuartas (2018), for example, examined neighborhood crime data for 1209 families residing in urban municipalities in Colombia, and found that violence near participant households increased the probability that parents hit their children with objects.

Several different mechanisms have been postulated to explain this general association. The first such explanation relates to the limited availability of key institutional resources in under-resourced neighborhoods (as reviewed at length in Leventhal & Brooks-Gunn, 2000), including limited access to quality, affordable child care, quality schools, and medical and social services, any or all of which could undermine parents' ability to provide nurturing care to their children. Another commonly cited theoretical explanation (Cuellar et al., 2015; Kohen et al., 2008) is the Family Stress Model, which posits that economic strain can cause immense stress for parents, and in doing so, undermines parental nurturance (Conger et al., 1992). Consistent with this possibility, at least one study found that neighborhood stress was associated with parenting via parent psychological distress (Gutman et al., 2005). Relatedly, parents' access to neighborhood friends and family may be limited in dangerous contexts (although not necessarily in under-resourced contexts), which could act to undermine parental behavior by limiting parental social support or by reducing access to shared child care by neighbors.

GAPS IN THE LITERATURE

Available literature thus highlights clear associations between neighborhoods and the parenting of their residents. That said, we would argue that more work is needed for several reasons. First, extant work provides only limited information regarding the specific parenting behaviors most associated with neighborhood characteristics. Are neighborhood features most important for undermining protective parenting, for accentuating harsh parenting, or for altering parental control? It would be quite important to answer this question, both because evidence of associations with only one type of parenting could lead to a different set of theoretical explanations than would associations with parenting more generally, but also because interventions aimed at improving specific parenting behaviors would benefit from evidence that different aspects of parenting have different environmental correlates.

A second limitation in extant neighborhood-parenting studies is their all but exclusive focus on mothers. This approach is problematic, as fathers and the father-child relationship are also critical relationships in a child's life (Cabrera et al., 2018). This may be especially true during middle childhood, during which time fathers have a key role in promoting gains in cognitive, emotion regulation, and autonomy abilities in their children (Keown et al., 2018). Efforts to understand neighborhood influences on parenting should thus consider whether and how observed associations persist to both fathers and mothers.

A third limitation of prior studies is that they have typically restricted themselves to either U.S. Census data for administratively-defined areas or to parent-reports of neighborhood characteristics (as reviewed in Cuellar et al., 2015). Although both approaches have merit, they each suffer from key limitations as well. The implicit assumption in the use of Census-area data, for example, is that administratively-defined neighborhoods provide a reasonable representation of the "true" neighborhood where one spends time and interacts with others (Foster & Hipp, 2011). This assumption is a subject of intense scrutiny in the fields of sociology and geography, which have generally concluded that the operationalization of neighborhood does affect our ability to correctly identify its effects (Foster & Hipp, 2011; Spielman et al., 2013). A simulation experiment conducted by Spielman et al. (2013), for example, observed systematic links between effect sizes and geographic scaling, such that neighborhood effects on behavior were overestimated when neighborhood scaling was too small and were underestimated when the scaling was too large. Relatedly, studies focused on Census tracts or block groups very rarely address the fact that neighborhoods typically have highly permeable borders, leading to considerable spatial contagion across ostensibly separate neighborhoods (Sampson, 2008). One approach in the field of geography for addressing spatial contagion is to collate neighbor informant-reports via egocentric or individual-level estimation techniques. Using these techniques, families who reside within a few kilometers of each other will share some but not all neighbor informant-reports, capturing the possibility of spillover across neighborhoods.

For their part, parental-informant reports of neighborhood characteristics benefit from the fact that they are assessing the exact neighborhood in which the families reside, without regard to the size of that neighborhood or to the presence of permeable borders. However, parental-informant reports are limited in that they assess subjective perceptions of neighborhood conditions, rather than objective indices (as provided by the Census data). What's more, when parenting is also assessed via parental informant report (as is often, though not always, the case), the use of parental informant reports of neighborhood conditions raises the specter of shared informant-effects, in which associations appear larger than they are simply because the same informant is used to collect both measures.

Finally, prior studies have only rarely sought to identify the specific characteristics of neighborhood context that are most important for parenting. This would be important, since neighborhoods are not unidimensional, static entities, but heterogeneous contexts with dynamic interrelations among built and social aspects of the neighborhood. Unfortunately, most empirical studies have

examined only one aspect of the neighborhood (usually with only one or two indices from the US Census or crime reports) and/or did not disambiguate neighborhood danger from neighborhood socioeconomic deprivation. Even current theory has been largely silent on this issue, often referring to 'impoverished and dangerous neighborhoods' without distinguishing between them (e.g., Kotchick & Forehand, 2002; Leventhal & Brooks-Gunn, 2000). As such, we know rather little about the specific characteristics of neighborhoods that relate to parenting, including whether associations between parenting and neighborhood context are driven primarily by one specific characteristic or whether parenting is independently associated with both neighborhood socioeconomic deprivation and neighborhood danger. Consistent with the possibility of differential associations across neighborhood characteristics, we note that a prior systematic review (Cuellar et al., 2015) concluded (but was not able to empirically test) that the associations between neighborhood and positive parenting may vary by type of neighborhood characteristic, including danger and socioeconomic deprivation. Alternately, it may be that the different neighborhood characteristics are associated with different aspects of parenting, such that socioeconomic deprivation is associated with harsher parenting while danger is associated with higher levels of parental control.

CURRENT STUDY

Given all of the above, it would be important to both confirm and further illuminate associations between specific neighborhood characteristics and parenting behaviors. We examined these associations in the Twin Study of Behavioral and Emotional Development in Children (TBED-C), a sample of over 1000 Michigan-born child twin families. These data are unusually well-positioned to examine the association between parenting and neighborhood context. When recruiting the participants, we oversampled families residing in neighborhoods with above average levels of neighborhood poverty, thereby facilitating in-depth examinations of neighborhood conditions in under-resourced contexts. We also augmented our twin family sampling strategy with an independent neighborhood informant sampling strategy, in which we collected informant-reports from several randomly selected neighbors residing near the twin families. This allowed us to include egocentric neighborhoods computed using state-of-the-science geographic techniques in our analyses as well as administratively-defined neighborhoods. Finally, both neighborhood and parenting were assessed using multiple informants and assessment strategies (e.g., neighborhood informants, family informants, administrative data, and videotaped parent–child interactions).

Although the depth and breadth of assessment strategies is in many ways a real asset to the current study, it is potentially problematic in one way. All empirical analyses are influenced by researcher decisions regarding the data. For example, researchers must decide which specific phenotypes to examine (e.g., warmth versus harshness), which informant-reports to examine (e.g., a specific informant versus observer-ratings), whether to control for particular demographic confounds, and so on. Different well-meaning researchers make different choices at these various analytic decision points, most often for legitimate reasons. However, the different decision points can sometimes alter study conclusions, in that the reported results are present only for a relatively narrow band of specifications. To circumvent this possibility, we conducted our analyses using an exhaustive modeling approach (Simonsohn et al., 2020) that avoids common sources of investigator bias in data selection and analysis by examining all available data specifications at all relevant decision points (i.e., type of parenting, mother versus father, assessment strategy for neighborhood and parenting, type of neighborhood characteristic, and control for demographic confounds). This approach also allows us to illuminate the association between parenting and neighborhood across a variety of different data specifications.

Given prior results (Cuellar et al., 2015), we expected that both neighborhood danger and neighborhood socioeconomic deprivation would be associated with lower levels of parental nurturance. We did not have any hypotheses regarding which aspect of the neighborhood, if either, would emerge as the stronger predictor of nurturing parenting. By contrast, we expected that

neighborhood danger would emerge as a stronger predictor of both parental control and harsh parenting (Choi et al., 2018; Cuartas, 2018), consistent with the notion that parents may be harsher and more controlling with their children when their safety is in jeopardy.

METHOD

Participants

The population-based Michigan State University Twin Registry (MSUTR) includes several independent twin projects. Participants in the current study were drawn from the TBED-C, a study within the MSUTR during 2008–2014. The TBED-C includes a population-based arm ($N = 528$ families), and an 'placed at risk' arm for which inclusion criteria also specified that participating twin families lived in neighborhoods with neighborhood poverty levels at or above the Census mean at study onset (10.5%) ($N = 502$ families). All procedures were approved by the primary author's institutional review board. Children provided informed assent. Parents provided informed consent for themselves and their children.

To recruit families, the Department of Vital Records in the Michigan Department of Health and Human Services (MDHHS) identified twins in our age-range via the Michigan Twins Project, a population-based registry of twins in lower Michigan recruited via birth records. The Michigan Bureau of Integration, Information, and Planning Services database was used to locate family addresses no more than 90–120 miles of East Lansing, MI through parent drivers' license information. Pre-made recruitment packets were then mailed to parents by the MDHHS. Parents who did not respond to the first mailing were sent additional mailings roughly 1 month apart until either a reply was received or up to four letters had been mailed.

This recruitment strategy for the TBED-C yielded an overall response rate of 57% for the placed at risk sample and 63% for the population-based sample. Other recruitment and sampling details can be found in prior publications (i.e., Burt & Klump, 2019). The two arms of the study were analyzed jointly for the current analyses. Collectively, the twins were 6–10 years old (mean age = 8.02 years, although 30 pairs turned 11 by time of their participation) and were 48.7% female and 51.3% male. The overall racial composition was White: 82%, Black: 10%, Asian: 1%, Indigenous: 1%, multiracial: 6%. However, families in the placed at risk sample, but not the population-based sample, were more racially diverse than the local population (e.g., 14% Black and 77% White in the placed at risk sample versus 5% Black and 87% White in the population-based sample; 5% Black and 85% White in the local area Census). Nearly all assessments included the twins' mothers (99%). Most assessments also included the twins' rearing father (82%), although in some cases he participated remotely (~5% of participating fathers). More than a third of the families (38.5%) resided in rural areas, 25.5% in suburban areas, and 36.0% in urban areas.

MEASURES

Parenting

Videotaped parent–child interactions

Assessments typically took place in our university laboratory (903 families). In the event that families were unable or unwilling to travel to the university, assessments took place in participants' homes (127 families; families with younger twins were more likely to complete home visits, as were families that identified as White). Observer-ratings of parenting were obtained using 8-minute video-taped interactions of all possible parent–child dyads (mother-twin 1, mother-twin 2, father-twin 1, and father-twin 2). The on-campus interactions took place in

offices that were set-up to resemble living rooms, with cameras inconspicuously installed in the ceiling. For those assessments occurring in participants' homes, interactions took place in a family living space with a video camera placed on a tripod in the room. Each parent–child dyad was asked to complete a mildly to moderately frustrating task (i.e., use an Etch-a Sketch to draw specific pictures, but parent and child may only use one dial each, thereby requiring cooperation; Deater-Deckard et al., 1997). All dyads completed the same task, although the specific pictures varied. The task was found to be a reliable and valid tool for assessing the parent–child relationship with school-age twins (Deater-Deckard et al., 1997).

Trained raters coded various aspects of parenting using two coding systems. The Twin Parent–Child Interaction System (Deater-Deckard et al., 1997) provides global ratings of parental behavior towards their child. We focused on the two measures of parenting behavior per se: parental negativity (or negative control), which assesses parental use of shaming, criticism, and physical control during the interaction, and positive control, or the use of praise and explanation. Each observer received roughly 85 hours of training and was required to pass observation examinations before coding videotapes. Observers attended coder meetings for ongoing training and to prevent "drift." Observer reliability was assessed by assigning 10% of all videos ($N = 200$) to be rated by at least five other observers, and then comparing the ratings using intraclass correlations. Inter-rater correlations for negative and positive control were .95 and .88, respectively. To reduce rater bias, each parent–child dyad was coded by a research assistant who was blind to all participant data. Further, different coders rated each of the four parent–child dyads within a family, eliminating the possibility of shared method variance. Maternal ratings were available for 1856 twins and paternal ratings were available for 1465 twins.

We then made use of a moment-by-moment coding system using a computer joystick apparatus (the Microsoft Sidewinder Force Feedback 2) and related software (Sadler et al., 2009). As detailed in Klahr et al. (2013), the joystick-monitoring software program displays a Cartesian plane with the axes of interpersonal warmth and interpersonal control or directiveness. The scale on the axes ranged from −1000 to 1000, with 1000 on the x-axis indicating extreme warmth and 1000 on the y-axis indicating extreme control. Warmth ranged from smiling or leaning towards the child, verbal praise, eye contact, and warm physical contact to looking away, unresponsiveness, and rude or sarcastic comments. Directiveness or control ranged from following the child's lead and asking for input to giving repeated instructions to grabbing the etch-a-sketch from the child. Observers were trained to use movement along the horizontal axis to indicate changes in warmth-related behaviors, and movement along the vertical axis to indicate changes in control-related behaviors. The software program recorded the x and y coordinates (ranging from −1000 to 1000) of the joystick's position twice per second. Coders were divided into teams of three to four raters, all of whom coded the interactions assigned to that team. Different teams coded the dyads within a given family (e.g., mother and twin 1; mother and twin 2), thereby eliminating the possibility of "shared rating" effects. Ratings were averaged across team members and across all moments to create overall ratings of parental warmth and control. Inter-rater alphas were .89 for control and .70 for warmth.

Informant-reports

Parental involvement and nurturance encompass a wide range of practices both within the home and outside in schools and communities. Here, we focused on parental investments in communication, closeness, and support in their relationship with their child as assessed via the parental nurturance or involvement scale (12 items; e.g., "I praise my child when he/she does something well"; "My child talks about his/her concerns and experiences with me") on the Parental Environment Questionnaire (PEQ; Elkins et al., 1997). Mothers and fathers individually rated their nurturance of each of their participating twins, whereas twins individually rated

the nurturance they received from mothers and fathers, respectively. Items were read to twins with reading levels under 5th grade to assure comprehension. We also assessed informants' perceptions of harsh or conflictive parenting practices via the parent–child conflict scale on the PEQ (12 items; e.g., "I often criticize my child"; "My child often angers or annoys me"). For both the nurturance and conflict measures, each item was rated on a 4-point scale from definitely true to definitely false. Both scales displayed good internal consistency reliability, with alphas between .68 and .87 across all individual informant-reports. Maternal and twin reports of mothering were each available for 98% twins. Paternal and twin reports of fathering were available for 82 and 94% of twins, respectively. Mother and father reports of their own conflict and nurturance were correlated .30 and .25, respectively (both $p < .01$). Twin-reports were more modestly correlated with parent reports, ranging from .13 to .18 (all $p < .01$).

Neighborhood

Neighborhood danger and neighborhood socioeconomic deprivation were assessed using administrative data and informant reports. We begin by describing the various administrative data, followed by the parent and neighbor informant-report measures.

Administrative data

Neighborhood socioeconomic deprivation was assessed using two administrative indicators (in addition to the informant-report data described later): the Area Deprivation Index and the Child Opportunity Index. The Area Deprivation Index (ADI) is a composite of 17 employment, housing-quality, poverty, and education measures drawn from American Community Survey data (Kind & Buckingham, 2018) based on the family's home address during the time period in which the parenting data were collected. Families' rank scores were weighted according to the factor loadings identified by Kind and Buckingham (2018), and then summed to create a socioeconomic deprivation index score for each block group. Participating families were assigned a % indicating the level of socioeconomic deprivation in their block group relative to that of all block groups in the country. The Child Opportunity Index (COI; Noelke et al., 2020) is a publicly available resource that combines 29 indicators across three domains: educational (e.g., quality of schools and social resources related to educational achievement), health/environmental (e.g., access to healthy food and greenspace, pollution and extreme heat), and socioeconomic (e.g., access to employment and neighborhood resources). Nationally normed z-scores were obtained and then matched to participating families at the Census tract level. Finally, in addition to the informant-reports of neighborhood danger described below, we collected data on the County-level crime rate pulled from the Michigan State police website, conditioned on population density (total offenses per 1000 inhabitants).

Parental informant-reports

Maternal and paternal perceptions of the socioeconomic conditions in their neighborhood were assessed using the Neighborhood Matters questionnaire (Henry et al., 2014). The Extent of Neighborhood Problems scale ($\alpha = .95$ for mothers and .96 for fathers) consists of 13 items assessing perceptions that graffiti, drugs, abandoned buildings, vandalism, etc., are a problem in their neighborhood. Note that maternal and paternal informant-reports from the Neighborhood Matters questionnaire were available for only 723 and 606 families, respectively, as the neighborhood questionnaire was in development during the early years of the study.

Maternal and paternal informant-reports of fear of neighborhood crime were assessed using the Fear of Crime scale (also from Neighborhood Matters questionnaire; Henry et al., 2014) and the Indirect Violence scale from the Kid-SAVE (Flowers et al., 2000). The 13-item Fear of Crime scale ($\alpha = .75$ for mothers and .76 for fathers) assesses the extent to which participants fear a variety of criminal acts in their community. Maternal and paternal reports of Fear of Crime were available for 744 and 612 families, respectively. The 17-item Indirect Violence scale ($\alpha = .89$ for mothers and .92 for fathers) assesses parent exposure to community violence (ECV; e.g., "I run for cover when people start shooting," "I have seen the police arrest someone," "I have seen someone pull a gun on someone else"). Maternal reports of ECV were available for 975 families and paternal reports of ECV were available for 821 families.

Neighbor informant-reports

The protocol for the placed at risk arm of the TBED-C also included the recruitment and assessment of randomly-chosen neighbors. Following the participation of a given family in the 'placed at risk' study, we sent mailings to 10 randomly-chosen addresses in that family's Census tract, inviting one adult resident per household to complete a survey. When a particular address was no longer inhabited (i.e., the letter was returned as undeliverable), one attempt was made to find a replacement address. This approach resulted in a sample of 188 neighbors (63.2% women; 80.6% White, 11.6% Black, 7.8% other ethnic group memberships; average age of 52.6 with a range of 18–95 years). The response rate was 70%, of which 70% agreed to participate (for a final participation rate of 49%).

We geocoded all neighbor and twin family addresses with a 99.9% success rate using an ".hmtl" code that uses Google Maps address data to assign coordinates. We then mapped the geocoded coordinates using ArcGIS v10.3 (ESRI 2020, Redlands, CA). We verified the spatial accuracy of 20 random geocoded locations by comparing the tabular data to ensure that the assigned county and city names correspond with the Census tract found in the original dataset. Using the geocoded coordinates, we calculated average neighbor informant-reports within 5 km of each twin family's residential location using ArcMap software. Descriptive statistics for these various spatial covariates were then calculated using Stata v13 (2013 College Station, TX). The mean number of neighbors living within 5 km (or 5000 m) of a given twin family was 13.09 (SD = 10.98), with a median of 10 and a range of 1–47. The mean distance to the nearest neighbor was 1437 m (SD = 1368 m), with a median of 855 m and a range of 0.25–4992 m. Nearly all families ($N = 847$) had at least one participating neighbor within 5 km. Neighbor informant-reports were also collected using the Neighborhood Matters questionnaire (Henry et al., 2014). We focused here on Extent of Neighborhood Problems and Fear of Crime (α ranged from .81 to .95). Exposure to Community Violence was not assessed in our neighborhood informant sample.

Analyses

We examined associations between parenting and neighborhood characteristics using random intercepts in multilevel modeling (MLM) in MPlus (Muthén & Muthén, 2020) to account for the nested structure of the data (i.e., twins and parents were nested within families). The Mplus Automation Package (Hallquist & Wiley, 2018) in R (R Development Core Team, 2020) was used to facilitate the specification curve analyses. Full information maximum likelihood estimation with robust standard errors was used to provide unbiased estimates in the face of missing data (Enders, 2001). As MLM coefficients are unstandardized, we standardized all variables to have a mean of zero and a standard deviation of 1.0 prior to analysis to facilitate interpretation of the fixed effect estimates.

Analyses were conducted using a specification curve approach. Specification curve analysis (Simonsohn et al., 2020) is an exhaustive modeling approach that evaluates all reasonable specifications of available data, both as a way of avoiding possible bias in investigator decisions but also to identify those specifications that are most consequential. We focused on the following specifications: (1) the measurement of parenting (parent–child conflict, parental nurturance, use of criticism and shaming, use of explanation and praise, parental control, and parental warmth); (2) the informant report used to assess parenting (mother, father, twin, observer-ratings); (3) the measurement of neighborhood socioeconomic deprivation (the Area Deprivation Index, the Child Opportunity Index, parent and neighbor informant-reports of Extent of Neighborhood Problems) and neighborhood danger (recorded County crime-rate, parent and neighbor informant-reports of Fear of Crime, parent reports of their own ECV); (4) the informant report used to assess neighborhood characteristics (mother, father, neighbors, administrative data), and (5) adjustment for potential demographic covariates (twin age, twin sex, family income, parental education, parental race, population density, or no covariates).

When examined across all possible combinations, there were 1232 possible specifications. We ran all possible combinations and then summarized the results across various specifications. As recommended by the SCA developers (Simonsohn et al., 2020), we focused here on median effect sizes, as medians are more robust to outliers than are means. We also evaluated the proportion of p values less than .05, reasoning that larger and more robust effects would be significant across a larger proportion of specifications.

To determine statistical significance, we simultaneously evaluated three indicators: 95% confidence intervals for the median, the median p value, and the mean Z-score. For the latter, we converted each p value to a Z-score and then computed the average Z-score (a Z-score of 1.96 corresponds to $p = .05$). To accommodate the slightly different sample sizes for various measures/informants, the average Z-score was weighted by sample size. Universal evidence of statistical significance across all three indicators (i.e., 95% confidence intervals that did not include negative values, a median p value less than .05, and an average Z-score greater than or equal to 1.96) was interpreted as evidence of a statistically significant effect size. Alternatively, an effect was deemed non-significant if the 95% confidence intervals included negative values, the median p value was greater than .05, and/or the average Z-score was less than 1.96.

RESULTS

Descriptive statistics for all variables are presented in Table 1. As seen there, these data contained families engaging in a wide range of parenting behaviors, as evidenced by normal distributions and wide standard deviations. This pattern held regardless of whether parenting was assessed via informant-report or observer-ratings of parent–child interactions. That said, and with the single exception of use of criticism and shaming (which did not differ across mothers and fathers), paired samples t-tests revealed significant mean differences in parenting between mothers and fathers. Mothers were observed to be warmer and to engage in more positive control strategies (i.e., use of explanation and praise) with their children compared to fathers (both $p < .01$). Mothers also reported more nurturing relationships with their children than did fathers, a pattern than persisted to twin reports of parental nurturance as well (both $p < .01$). By contrast, fathers were observed to engage in higher levels of directiveness or control with their children relative to mothers, and reported higher levels of parental harshness and conflict with their children than did mothers (both $p < .01$). Interestingly, however, the twins' perceptions of parental harshness did not align with that of their parents, with twins reporting higher levels of conflict with their mother as compared to their father ($p < .01$).

We also observed a wide variety of neighborhoods in our sample, across both the various indices of neighborhood socioeconomic deprivation and the various indices of neighborhood

TABLE 1 Descriptives

Measure	Mean	SD	Min	Max
Mother report of harsh or conflictive parenting	20.67	5.92	12	42
Twin report of harsh or conflictive parenting by mother	20.69	6.03	12	46
Father report of harsh or conflictive parenting	21.36	5.96	12	42
Twin report of harsh or conflictive parenting by father	19.92	6.66	12	47
Mother report of involved, nurturing parenting	43.15	3.06	30	48
Twin report of involved, nurturing parenting by mother	39.76	5.78	16	48
Father report of involved, nurturing parenting	40.50	4.22	23	48
Twin report of involved, nurturing parenting by father	38.31	6.99	12	48
Mother's use of explanation and praise	2.82	.55	1	5
Father's use of explanation and praise	2.78	.59	1	5
Mother's use of criticism, shaming, and physical control	1.68	.76	1	6
Father's use of criticism, shaming, and physical control	1.72	.78	1	5
Mother's warmth	279.48	194.86	−601.22	787.43
Father's warmth	242.23	159.24	−472.61	769.52
Mother's control or directiveness	377.95	319.79	−911.69	930.97
Father's control or directiveness	423.89	250.95	−676.87	940.95
Area deprivation index (%)	57.24	22.67	2	99
Child Opportunity Index (Z-score)	0.01	.03	−.11	.07
Mother report on fear of crime	2.49	2.77	0	16
Father report on fear of crime	2.20	2.58	0	18
Neighbor report on fear of crime	3.93	2.24	0	14.33
County crime rate (total offenses/1000 people)	86.08	24.31	27.71	153.15
Mother report on exposure to community violence	6.26	6.02	0	48
Father report on exposure to community violence	8.19	7.37	0	51
Mother report on extent of problems	22.11	10.43	13	65
Father report on extent of problems	22.59	10.03	13	65
Neighbor report on extent of problems	25.94	6.96	13	55

danger. Paired samples t-tests indicated that perceptions of neighborhoods also varied across informants. Neighbors reported higher levels of both fear of crime and perceptions of neighborhood problems relative to either parent. That said, there were also differences within families. Fathers reported more ECV and perceived the neighborhood to be more dangerous than did mothers, even as mothers reported more fear of crime than did fathers.

Specification curve analyses

MLM analyses were performed to quantify associations between parenting and neighborhood factors adjusting for covariates and the nesting of individuals within families. Results are presented in Tables 2 and 3, both overall and for mothers and fathers separately. Of note, to facilitate comparison and to compute overall effect sizes, the protective aspects of parenting were reverse scored prior to analysis, so that high-scores index low levels of protective parenting. Similarly, the COI was reverse-scored so that high-scores index low levels of opportunity. Raw correlations across the 11 measures of neighborhood and the 16 measures of parenting are presented in Table S1.

As seen in Table 2, neighborhood socioeconomic deprivation (as operationalized collectively via the ADI, the COI, and informant-reports of the Extent of Neighborhood Problems) exhibited a small, but not quite significant association with parenting overall (the median p value was .049 and the average Z-score was 2.11, but the 95% confidence intervals were slightly lower than zero). When we examined these associations separately across the various aspects of parenting assessed in our data, however, it was clear that socioeconomic deprivation was associated with specific aspects of parenting. In particular, families residing in under-resourced neighborhoods reported lower levels of parental involvement and nurturance. Parents in under-resourced neighborhoods also engaged in less frequent use of explanation and praise and more parental control or directiveness in their videotaped interactions with their children. These associations were small but robust across specifications, with median effect sizes ranging from .08 to .13, of which 60.1%–84.3% were significant at $p < .05$. Similarly, the median p values were ≤ .05 and the average Z-scores ranged from 2.48 to 4.11. Conflict, warmth, and the use of criticism and shaming, by contrast, were unrelated to neighborhood socioeconomic deprivation.

These associations between neighborhood socioeconomic deprivation and positive parenting were consistently present in mothers, but less so for fathers. Socioeconomic deprivation was associated with less frequent maternal use of explanation and praise, and higher levels of maternal control in their videotaped interactions with their children, as well as less maternal nurturance according to informant-reports. These associations were relatively robust, with median ES ranging from .09 to .13, of which 78.7%–89.6% were significant at $p < .05$. Similarly, the median p values were < .005 and the average Z-scores ranged from 3.02 to 4.40. However, only two of these effects persisted to fathers (less frequent use of explanation and praise, and low levels of father-child nurturance). In short, although neighborhood socioeconomic deprivation was related to protective parenting in general, this association was present across a broader array of parenting behaviors for mothers than fathers.

By contrast, neighborhood danger (as operationalized collectively via recorded crime, parent and neighbor perceptions of Fear of Crime, and parent ECV) was not associated with parenting overall, in mothers or in fathers (see Table 3). Despite these overall null results, we did observe a few significant associations at the more granular level, such that more explanation and praise during mother and father interactions with their children were consistently associated with lower levels of neighborhood danger. Maternal control or directiveness was also positively associated with neighborhood danger, although this association did not extend to fathers. Neither of the informant-reported aspects of parenting varied with neighborhood danger, regardless of whether we were examining parenting overall or restricting our analyses to mothers or fathers.

As another way of illuminating these associations, we evaluated them separately across the various indices of socioeconomic deprivation and danger, respectively (see Table 4). We observed consistently significant associations with parenting for the ADI across parenting overall, mothering overall, and fathering overall. Results were less consistently significant when examining the COI and a composite informant-report
of neighborhood problems, but we did observe significant associations for mothering in particular. For neighborhood danger, we observed only one significant association (between mothering and maternal self-reports of her ECV), but not when examining any of the other indices of neighborhood danger.

To clarify the specificity of these effects, we combined the above analyses for danger and socioeconomic deprivation into a single regression to evaluate whether neighborhood danger and socioeconomic deprivation retained their associations with parenting when controlling for each other. This was an important final step, given that the various indices of neighborhood danger were positively correlated with the various indices of neighborhood socioeconomic deprivation (typically in the .2–.4 range; see Table S2). Results are briefly presented in Table 4, and in a detailed way in Table S3. As seen there, the observed association between ECV and

TABLE 2 Associations between parenting and neighborhood socioeconomic deprivation

		Parenting in general	Harsh or conflictive parenting[a]	Nurturing, involved parenting (reverse-scored)[a]	Parental warmth (reverse-scored)[b]	Parental control or directiveness [b]	Use of explanation and praise (reverse-scored)[b]	Use of criticism, shaming, and physical control[b]
Across both parents	Median ES	.06	.05	**.09***	.03	**.08***	**.13***	.03
	95% CIs	(−.003, .13)	(−.01, .12)	**(.03, .16)**	(−.03, .11)	**(.01, .15)**	**(.06, .21)**	(−.04, .10)
	Median *p* value	.049	.052	**.006**	.230	**.026**	**<.001**	.361
	% $p < .05$	53.9	50.9	**71.4**	20.3	**60.1**	**84.3**	16.0
	Avg Z-score	2.11	1.42	**2.81**	0.74	**2.48**	**4.11**	1.01
Mothers only	Median ES	**.09***	.04	**.09***	.06	**.13***	**.13***	.04
	95% CIs	**(.02, .15)**	(−.02, .09)	**(.03, .16)**	(−.01, .12)	**(.06, .19)**	**(.07, .19)**	(−.03, .10)
	Median *p* value	**.009**	.025	**.003**	.078	**<.001**	**<.001**	.279
	% $p < .05$	**66.6**	67.0	**78.7**	43.5	**89.6**	**85.6**	20.8
	Avg Z-score	**2.36**	0.87	**3.04**	1.56	**4.01**	**4.40**	1.31
Fathers only	Median ES	.06	.05	**.10***	.01	.05	**.16***	.01
	95% CIs	(−.01, .12)	(−.02, .12)	**(.03, .16)**	(−.06, .07)	(−.03, .13)	**(.07, .24)**	(−.06, .09)
	Median *p* value	.078	.142	**.004**	.254	.182	**<.001**	.633
	% $p < .05$	47.9	33.0	**77.2**	3.8	40.4	**97.2**	16.9
	Avg Z-score	1.99	1.71	**2.96**	0.18	1.43	**4.56**	0.65

Note: We report median effect sizes (ES) and median lower and upper 95% confidence intervals, and the proportion of specifications that had a *p* value <.05. We also converted each *p* value to a Z-score and then computed the average *Z*-score. Those ES that were identified as statistically significant across all indices are bolded with an *. [a] and [b] indicate informant-report and observer-ratings data, respectively. Neighborhood socioeconomic deprivation was operationalized via the Area Deprivation Index, the Child Opportunity Index, and parent and neighbor informant-reports of Extent of Neighborhood Problems.

TABLE 3 Associations between parenting and neighborhood danger

		Parenting in general	Harsh or conflictive parenting[a]	Nurturing, involved parenting (reverse-scored)[a]	Parental warmth (reverse-scored)[b]	Parental control or directiveness[b]	Use of explanation and praise (reverse-scored)[b]	Use of criticism, shaming, and physical control[b]
Across both parents	Median ES	.03	.01	.02	.04	.04	**.07***	.05
	95% CIs	(−.03, .10)	(−.05, .08)	(−.04, .08)	(−.03, .11)	(−.03, .12)	**(.01, .14)**	(−.03, .12)
	Median *p* value	.232	.286	.409	.230	.255	**.034**	.163
	% $p < .05$	28.3	17.2	23.1	21.6	41.9	**64.9**	22.0
	Avg Z-score	1.03	0.33	0.81	1.08	2.00	**2.32**	0.92
Mothers only	Median ES	.05	.02	.04	.05	**.10***	**.07***	.03
	95% CIs	(−.01, .11)	(−.04, .08)	(−.03, .10)	(−.01, .11)	**(.05, .16)**	**(.01, .13)**	(−.03, .09)
	Median *p* value	.073	.097	.257	.120	**<.001**	**.015**	.242
	% $p < .05$	46.0	34.9	34.4	37.6	**92.1**	**73.8**	34.2
	Avg Z-score	1.41	0.22	1.18	1.62	**3.80**	**2.67**	0.97
Fathers only	Median ES	.02	.01	.02	.02	.01	**.08***	.06
	95% CIs	(−.04, .08)	(−.05, .07)	(−.05, .07)	(−.05, .09)	(−.06, .08)	**(.01, .15)**	(.00, .13)
	Median *p* value	.233	.482	.421	.330	.739	**.034**	.053
	% $p < .05$	19.7	7.4	14.4	2.9	27.5	**61.4**	28.8
	Avg Z-score	0.78	0.53	0.39	0.52	1.23	**2.12**	1.08

Note: We report median effect sizes (ES) and median lower and upper 95% confidence intervals, and the proportion of specifications that had a *p* value <.05. We also converted each *p* value to a Z-score and then computed the average *Z*-score. Those ES that were identified as statistically significant across all indices are bolded with an *. [a] and [b] indicate informant-report and observer-ratings data, respectively. Neighborhood danger was operationalized via recorded County crime-rate, parent and neighbor informant-reports of Fear of Crime, and parent reports of their own ECV.

TABLE 4 Associations of neighborhood danger and socioeconomic deprivation with parenting in general

		Deprivation			Danger		
		ADI[b]	COI (reverse-scored)[b]	Informant-reports of neighborhood problems[a]	Informant-reports of fear of crime[a]	Parental self-reports of their exposure to community violence[a]	County crime rate[b]
Parenting overall	Median ES	**.09‡**	.06*	.06	.04	.05	.00
	95% CIs	**(.03, .14)**	(.00, .13)	(−.01, .13)	(−.03, .11)	(−.01, .12)	(−.06, .05)
	Median *p* value	**.004**	.025	.083	.236	.094	.593
	% $p < .05$	**66.9**	60.9	44.8	26.5	36.6	16.7
	Avg Z-score	**2.72**	2.03	1.86	1.16	1.51	−0.14
Mothering overall	Median ES	**.09‡**	.07*	.09*	.05	.08*	.00
	95% CIs	**(.03, .14)**	(.01, .13)	(.02, .16)	(−.02, .11)	(.01, .14)	(−.06, .05)
	Median *p* value	**.005**	.008	.014	.066	.016	.325
	% $p < .05$	**70.9**	71.3	60.8	47.9	57.5	31.8
	Avg Z-score	**2.82**	2.07	2.24	1.63	2.47	0.05
Fathering overall	Median ES	**.09‡**	.06	.04	.06	.03	−.01
	95% CIs	**(.03, .14)**	(.00, .13)	(−.03, .12)	(−.02, .14)	(−.03, .09)	(−.07, .05)
	Median *p* value	**.004**	.054	.228	.122	.089	.716
	% $p < .05$	**62.6**	49.5	37.3	27.1	28.7	0.0
	Avg Z-score	**2.62**	1.99	1.59	1.35	1.08	−0.35

Note: We report median effect sizes (ES) and median lower and upper 95% confidence intervals, and the proportion of specifications that had a *p* value <.05. We also converted each *p* value to a Z-score and then computed the average Z-score. Those ES that were identified as statistically significant across all indices, but did not persist when controlling for overlap with the other neighborhood dimension are indicated with *. Those ES that were identified as statistically significant across all indices and remained significant even after controlling for overlap with the other neighborhood dimension indicated with ‡ and bold font (detailed results are presented in Table S3). [a] and [b] indicate informant-report and administrative data, respectively.

mothering dissipated once it was modeled alongside neighborhood deprivation. By contrast, all of the associations with the ADI and parenting in general remained significant (and did so with essentially identical effect sizes).

To further confirm that associations between neighborhood and parenting were largely a function of socioeconomic deprivation as opposed to danger, we repeated the above analyses for parental praise and explanation only, reasoning that because this particular set of associations was the most robust for neighborhood danger, it would be most likely to survive controls for neighborhood deprivation. Zero-order associations are presented in Table 5, while the independent associations controlling for the other dimension of neighborhood are presented in detail in Table S4. As seen there, all three indices of neighborhood socioeconomic deprivation were associated with the use of explanation and praise, in general, for mothers, and for fathers. The median effect sizes were .12–.20, the median *p* values were less than or equal to .002, and the average Z-scores ranged from 2.97 to 6.00. We also observed consistently significant associations for fear of crime and parental ECV, although they were more modest in magnitude (median effect sizes ranged from .07 to .10). Critically, however, whereas all of the neighborhood socioeconomic deprivation associations persisted after controlling for overlap with neighborhood danger, the reverse was not observed. Only one association, that between paternal ECV and his use of explanation and praise, persisted in that case.

TABLE 5 Associations of neighborhood danger and socioeconomic deprivation with parental use of explanation and praise

		Deprivation			Danger		
		ADI[b]	COI (reverse-scored)[b]	Informant-reports of neighborhood problems[a]	Informant-reports of fear of crime[a]	Parental self-reports of their exposure to community violence[a]	County crime rate [b]
Overall use of explanation and praise	Median ES	**.17⁑**	**.18⁑**	**.12⁑**	.07*	.09*	.01
	95% CIs	**(.11, .22)**	**(.12, .23)**	**(.05, .19)**	(.00, .14)	(.04, .15)	(−.04, .07)
	Median *p* value	**<.001**	**<.001**	**.002**	.047	.001	.387
	% $p < .05$	**93.4**	**93.4**	**76.0**	58.2	89.7	33.3
	Avg Z-score	**5.48**	**5.26**	**2.97**	2.15	3.19	1.09
Mothers' use of explanation and praise	Median ES	**.16⁑**	**.17⁑**	**.13⁑**	.08*	.09*	.06*
	95% CIs	**(.11, .21)**	**(.12, .22)**	**(.06, .19)**	(.01, .15)	(.04, .15)	(.01, .11)
	Median *p* value	**<.001**	**<.001**	**<.001**	.026	.001	.017
	% $p < .05$	**88.0**	**88.0**	**82.4**	81.4	75.2	60.8
	Avg Z-score	**5.05**	**5.26**	**3.42**	3.03	2.64	2.13
Fathers' use of explanation and praise	Median ES	**.20⁑**	**.20⁑**	**.13⁑**	.08*	**.10⁑**	.00
	95% CIs	**(.14, .26)**	**(.13, .26)**	**(.05, .21)**	(.01, .15)	**(.04, .16)**	(−.06, .06)
	Median *p* value	**<.001**	**<.001**	**.001**	.032	**.001**	.980
	% $p < .05$	**100.0**	**100.0**	**93.6**	86.3	**86.1**	0.0
	Avg Z-score	**6.00**	**5.27**	**3.15**	2.22	**3.19**	−0.18

Note: We report median effect sizes (ES) and median lower and upper 95% confidence intervals, and the proportion of specifications that had a *p* value < .05. We also converted each *p* value to a Z-score and then computed the average Z-score. Those ES that were identified as statistically significant across all indices, but did not persist when controlling for overlap with the other neighborhood dimension are indicated with *. Those ES that were identified as statistically significant across all indices and remained significant even after controlling for overlap with the other neighborhood dimension indicated with ⁑ and bold font (detailed results are presented in Table S4). [a] and [b] indicate informant-report and administrative data, respectively.

As a final step, we evaluated whether our overall conclusions persisted to rural and urban neighborhoods, repeating our primary analyses separately for those families residing urban neighborhoods (36.0% of the sample) and those families residing in rural neighborhoods (38.5% of the sample). Population density was removed as a covariate. Median effect sizes are presented in Table S5. As seen there, results in both urban and rural neighborhoods again suggested that positive parenting was associated with neighborhood socioeconomic deprivation in particular, implying that our primary conclusions are largely robust to urbanicity.

DISCUSSION

The goal of the present study was to more fully illuminate the associations between neighborhood and parenting. Results revealed that neighborhood socioeconomic deprivation was consistently associated with lower parental nurturance according to informant-reports and with less parental use of explanation and praise during a difficult task according to observer-ratings. These associations persisted across mothers and fathers, and regardless of urbanicity. Neighborhood socioeconomic deprivation was also associated with higher levels of maternal control. By contrast, neighborhood danger did not predict parenting behaviors, with the primary exception of less use of praise. However, the latter association largely dissipated when controlling for overlap with neighborhood socioeconomic deprivation. The current results thus suggest that associations between neighborhood context and parenting during middle childhood are specific to protective aspects of parenting and to neighborhood socioeconomic deprivation.

Such findings extend our understanding of the links between neighborhood context and parenting. In their systematic review, Cuellar et al. (2015) concluded that both neighborhood danger and neighborhood disadvantage were generally associated with positive parenting behaviors, but they were not able to evaluate associations with socioeconomic deprivation controlling for danger and vice versa. When danger and socioeconomic deprivation were examined individually in the present study, our findings supported the conclusions of Cuellar et al. (2015). However, when they were entered into the same model, it became clear that these associations were primarily a function of socioeconomic deprivation rather than danger.

That said, it remains unclear whether danger would exhibit more robust associations with other aspects of parenting not examined herein. For example, basic caretaking behaviors necessary for survival were not examined here, nor was abuse. We also did not examine parental monitoring of children's activities, even though prior work (Jones et al., 2005) has suggested that parents engage in higher levels of monitoring in the presence of dangerous neighborhood conditions. We were also unable to consider issues of goodness of fit, in which (for example) the relevant components of nurturing parenting are determined by child characteristics, among other things. Future work should examine these elements of parenting as well.

The current study benefited from a number of strengths that increase confidence in our results, including the use of a strong sampling frame (birth records) enriched for exposure to neighborhood disadvantage, the use of an exhaustive modeling framework, and the extensive and state-of the-science measurements of neighborhood and parenting. Despite these strengths, several limitations are noted. First and foremost, the cross-sectional and non-experimental nature of our study design does not permit us to make any firm conclusions regarding the direction of the associations (neighborhood to parenting or vice versa). Future work should extend our understanding of directionality and causality in the association between parenting and neighborhood socioeconomic deprivation via longitudinal or experimental studies. Consistent with this, although we identified neighborhood-level associations with protective parenting, the observed median effect sizes were small in magnitude, suggesting that parenting is also influenced by multiple other factors (e.g., culture, parent personality, child behavior, etc.).

Relatedly, because our sample primarily identified as White non-Hispanic, we controlled for parental race and ethnicity in our analyses rather than conducting analyses separately for those with specific marginalized identities. Although necessary to assure sufficient statistical power, this approach was less than ideal for (at least) three reasons. First, parenting behaviors and their outcomes vary to some extent by race and ethnicity. For example, parents who identify as Black have been shown to engage in higher levels of parental control (Richman & Mandara, 2013), but do so with more positive consequences for their children, than parents who identify as White (Dunbar et al., 2017). Relatedly, none of the parenting measures examined here have been explicitly validated for use with participants from marginalized populations. It is thus unknown whether the parenting measures examined here function as intended in those populations. Finally, danger and socioeconomic deprivation are not randomly distributed across neighborhoods, but are in many cases a direct legacy of historical structural racism (e.g., redlining, blockbusting, placement of freeway construction) (Nardone et al., 2020). The modern-day legacies of these racist practices from the past are many and include less neighborhood greenspace (Nardone et al., 2021) and higher vacancy (Sadler & Lafreniere, 2016), among others. Given all this, the current findings may not generalize to the parenting of those with racialized identities. Future research should explicitly evaluate this important issue.

Next, our results should be considered specific to middle childhood, and may not extend to either adolescence or toddlerhood. Consistent with this idea, re-analyses of the Moving to Opportunity experiment found that moving to lower poverty neighborhoods from high-poverty housing projects improves outcomes in adulthood (e.g., less single parenting), but only if the move occurred prior to the age of 13 (Chetty et al., 2016). Another limitation centers on the fact that the children in our study were twins. Although twins are representative of singletons on most traits (e.g., Christensen & McGue, 2020), parenting two children exactly the same age imposes additional hurdles for parents that could influence the parenting they provide. It remains unclear, however, whether or how this may have influenced our findings.

Despite these limitations, the current study does have a few key implications. Namely, our results indicate that under-resourced neighborhood contexts are associated with lower levels of parental nurturance and less use of praise and explanation by both parents, and with higher levels of directiveness or control by mothers in particular. These findings were robust to measurement strategy, persisting across informant-reports and observer-ratings of positive parenting strategies, as well as across informant-reports and administrative data regarding neighborhood conditions. Such findings collectively suggest that, consistent with prior extensions of Belsky's determinants of parenting model, the broader neighborhood context should be considered a key correlate of protective parenting behavior.

That said, the links between parenting and neighborhood were largely a function of neighborhood socioeconomic deprivation as opposed to neighborhood danger. Put another way, although socioeconomic deprivation certainly creates opportunity for crime and danger, the current results imply that danger and socioeconomic deprivation do not function as interchangeable characteristics of the neighborhood, at least in terms of their relationship to positive parenting. Given all this, it would be important for neighborhood theories to substantively consider the inherently complex dynamics among structural neighborhood characteristics in their conceptualization of the mechanisms underlying 'neighborhood' effects.

Relatedly, our findings indicated that neighborhood associations were specific to particular aspects of parenting behavior (most notably, parental nurturance and parental use of explanation and praise) rather than to parenting in general. Such findings clearly align with results from a recent meta-analysis of genetically-informed studies of parenting behavior (Klahr & Burt, 2014), which noted significant discrepancies in the respective etiologies of parental warmth, control, and negativity, especially when analyses were conducted using parent-based twin designs. When viewed together, such findings indicate that, rather than speculating as to the determinants of parenting behavior *in general*, theory regarding the origins of parenting

behavior should instead conceptualize the origins of parental warmth, control, and negativity as at least partially separable constructs, or at the very least, consider how their general theory might be differentially important for understanding different aspects of parenting behavior.

In conclusion, the current study indicates that, despite the intense stress of rearing twins in an impoverished and under-resourced area, parents in these areas were not harsher or more controlling with their children than were parents in wealthy areas. They were, however, slightly less nurturing with their children and less likely to use explanation and praise. What might drive this association? Laboratory and experimental research suggest that, like nearly all species, humans detect and process cues in their surrounding environment related to the abundance of food, habitation, and other resources. These cues then influence the organism's behavior, sympathetic and parasympathetic nervous activity, and ultimately, stress or recovery from stress (e.g., South et al., **2015**). Given this, we postulate that signs of neighborhood disorder (e.g., trash, discarded drug paraphernalia, broken windows, vacant lots, noisy roads, and airports) induce elevated levels of parental stress, which then limits their capacity to provide as much nurturance, explanation, and praise to their children as they otherwise might. There is growing empirical evidence supporting this possibility. Objective measures of the built environment (e.g., neighborhood audits, sensors, or geospatial data), for example, have shown that individuals in noisier neighborhoods have elevated cortisol, elevated heart rate during a laboratory stressor, higher perceived stress, and worse cognitive functioning (e.g., van Kamp et al., **2015**). Higher levels of neighborhood greenspace, by contrast, have been associated with lower levels of distress, even after adjustment for age, sex, maternal education, and neighborhood socioeconomic status (Amoly et al., **2014**). Future work should explore the possibility that the built environmental features found in under-resourced neighborhoods may tap into biological systems related to the detection of security and other resources in the surrounding environment.

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REFERENCES

Amoly, E., Dadvand, P., Forns, J., Lopez-Vicente, M., Basagana, X., Julvez, J., Alvarez-Pedrerol, M., Nieuwenhuijsen, M. J., & Sunyer, J. (2014). Green and blue spaces and behavioral development in Barcelona schoolchildren: tataCorp. the BREATHE project. *Environmental Health Perspectives*, *122*(12), 1351–1358. https://doi.org/10.1289/ehp.1408215

Belsky, J. (1984). The determinants of parenting: A process model. *Child Development*, *55*, 83–96. https://doi.org/10.2307/1129836

Burt, S. A., & Klump, K. L. (2019). The Michigan State University Twin Registry (MSUTR): 15 years of twin and family research. *Twin Research and Human Genetics*, *22*(6), 741–745. https://doi.org/10.1017/thg.2019.57

Cabrera, N. J., Volling, B. L., & Barr, R. (2018). Fathers are parents, too! Widening the lens on parenting for children's development. *Child Development Perspectives*, *12*(3), 152–157. https://doi.org/10.1111/cdep.12275

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. https://doi.org/10.1257/aer.20150572

Choi, J. K., Kelley, M. S., & Wang, D. (2018). Neighborhood characteristics, maternal parenting, and health and development of children from socioeconomically disadvantaged families. *American Journal of Community Psychology*, *62*(3–4), 476–491. https://doi.org/10.1002/ajcp.12276

Christensen, K., & McGue, M. (2020). The twin representativeness assumption. *Neuroscience and Biobehavioral Reviews*, *112*, 374–375. https://doi.org/10.1016/j.neubiorev.2020.02.026

Conger, R. D., Conger, K. J., Elder, G. H., Lorenz, F. O., Simons, R. L., & Whitbeck, L. B. (1992). A family process model of economic hardship and adjustment of early adolescent boys. *Child Development*, *63*(3), 526–541. https://doi.org/10.2307/1131344

Cuartas, J. (2018). Neighborhood crime undermines parenting: Violence in the vicinity of households as a predictor of aggressive discipline. *Child Abuse & Neglect*, *76*, 388–399. https://doi.org/10.1016/j.chiabu.2017.12.006

Cuellar, J., Jones, D. J., & Sterrett, E. (2015). Examining parenting in the neighborhood context: A review. *Journal of Child and Family Studies*, *24*(1), 195–219. https://doi.org/10.1007/s10826-013-9826-y

Deater-Deckard, K., Pylas, M., & Petrill, S. A. (1997). *The parent-child interaction system (PARCHISY)*. Institute of Psychiatry.

Dunbar, A. S., Leerkes, E. M., Coard, S. I., Supple, A. J., & Calkins, S. (2017). An integrative conceptual model of parental racial/ethnic and emotion socialization and links to children's social-emotional development among African American families. *Child Development Perspectives*, *11*(1), 16–22. https://doi.org/10.1111/cdep.12218

Elkins, I. J., McGue, M. K., & Iacono, W. G. (1997). Genetic and environmental influences on parent-son relationships: Evidence for increasing genetic influence during adolescence. *Developmental Psychology*, *33*, 351–363. https://doi.org/10.1037//0012-1649.33.2.351

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*, 430–457.

ESRI. (2020). *ArcGIS Desktop: Release 10.10*. Environmental Systems Research Institute.

Flowers, A. L., Hastings, T. L., & Kelley, M. L. (2000). Development of a screening instrument for exposure to violence in children: The KID-SAVE. *Journal of Psychopathology and Behavioral Assessment*, *22*, 91–104. https://doi.org/10.1023/A:1007580616096

Foster, K. A., & Hipp, J. A. (2011). Defining neighborhood boundaries for social measurement: Advancing social work research. *Social Work Research*, *35*(1), 25–35 https://www.jstor.org/stable/42659777

Gutman, L. M., McLoyd, V. C., & Tokoyawa, T. (2005). Financial strain, neighborhood stress, parenting behaviors, and adolescent adjustment in urban African American families. *Journal of Research on Adolescence*, *15*(4), 425–449. https://doi.org/10.1111/j.1532-7795.2005.00106.x

Hallquist, M. N., & Wiley, J. F. (2018). MplusAutomation: An R package for facilitating large-scale latent variable analyses in Mplus. *Structural Equation Modeling: A Multidisciplinary Journal*, *25*(4), 621–638. https://doi.org/10.1080/10705511.2017.1402334

Henry, D. B., Gorman-Smith, D., Schoeny, M. E., & Tolan, P. H. (2014). "Neighborhood matters": Assessment of neighborhood social processes. *American Journal of Community Psychology*, *54*(3–4), 187–204. https://doi.org/10.1007/s10464-014-9681-z

Jones, D. J., Forehand, R., O'Connell, C., Armistead, L., & Brody, G. (2005). Mothers' perceptions of neighborhood violence and mother-reported monitoring of African American children: An examination of the moderating role of perceived support. *Behavior Therapy*, *26*(1), 25–34. https://doi.org/10.1016/S0005-7894(05)80051-6

Keown, L. J., Franke, N., & Kaur, R. (2018). The role of fathers in supporting children's development. In *Handbook of parenting and child development across the lifespan* (pp. 121–142). Springer.

Kind, A. J., & Buckingham, W. R. (2018). Making neighborhood-disadvantage metrics accessible—The neighborhood atlas. *New England Journal of Medicine*, *378*(26), 2456–2458. 10.1056%2FNEJMp1802313

Klahr, A. M., & Burt, S. A. (2014). Elucidating the etiology of individual differences in parenting: A meta-analysis of behavioral genetic research. *Psychological Bulletin*, *140*, 544–586. https://doi.org/10.1037/a0034205

Klahr, A. M., Thomas, K. M., Hopwood, C. J., Klump, K. L., & Burt, S. A. (2013). Evocative gene-environment correlation in the mother-child relationship: A twin study of interpersonal processes. *Development and Psychopathology*, *25*(1), 105–118. https://doi.org/10.1017/S0954579412000934

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. https://doi.org/10.1111/j.1467-8624.2007.01117.x

Kotchick, B. A., & Forehand, R. (2002). Putting parenting in perspective: A discussion of the contextual factors that shape parenting practices. *Journal of Child and Family Studies*, *11*(3), 255–269. https://doi.org/10.1023/A:1016863921662

Leventhal, T., & Brooks-Gunn, J. (2000). The neighborhoods they live in: The effects of neighborhood residence on child and adolescent outcomes. *Psychological Bulletin*, *126*, 309–337. https://doi.org/10.1037/0033-2909.126.2.309

Leventhal, T., & Brooks-Gunn, J. (2003). Moving to opportunity: An experimental study of neighborhood effects on mental health. *American Journal of Public Health*, *93*(9), 1576–1582. 10.2105%2Fajph.93.9.1576

Luster, T., & Okagaki, L. (2006). *Parenting: an ecological perspective*. Routledge.

Muthén, L. K., & Muthén, B. O. (2017). *Mplus (Version 8) [Computer software]*. Los Angeles, CA: Author.

Nardone, A., Chiang, J., & Corburn, J. (2020). Historic redlining and urban health today in U.S. cities. *Environmental Justice*, *13*(4), 109–119. https://doi.org/10.1089/env.2020.0011

Nardone, A., Rudolph, K. E., Morello-Frosch, R., & Casey, J. A. (2021). Redlines and greenspace: The relationship between historical redlining and 2010 greenspace across the United States. *Environmental Health Perspectives*, *129*(1), 17006. https://doi.org/10.1289/ehp7495

Noelke, C., McArdle, N., Baek, M., Huntington, N., Huber, R., Hardy, E., & Acevedo-Garcia, D. (2020). Child Opportunity Index 2.0 Technical Documentation. diversitydatakids.org/research-library/research-brief/how-we-built-it.

Richman, S. B., & Mandara, J. (2013). Do socialization goals explain differences in parental control between black and white parents? *Family Relations*, *62*(4), 625–636. https://doi.org/10.1111/fare.12022

Sadler, P., Ethier, N., Gunn, G. R., Duong, D., & Woody, E. (2009). Are we on the same wavelength? Interpersonal complementarity as shared cyclical patterns during interactions. *Journal of Personality and Social Psychology*, *97*(6), 1005–1020. https://doi.org/10.1037/a0016232

Sadler, R. C., & Lafreniere, D. J. (2016). Racist housing practices as a precursor to uneven neighborhood change in a post-industrial city. *Housing Studies*, *1-23*, 186–208. https://doi.org/10.1080/02673037.2016.1181724

Sampson, R. J. (2008). Moving to inequality: Neighborhood effects and experiments meet structure. *American Journal of Sociology*, *114*(11), 189–231. 10.1086%2F589843

Simonsohn, U., Simmons, J. P., & Nelson, L. D. (2020). Specification curve analysis. *Nature Human Behaviour*, *4*(11), 1208–1214.

South, E. C., Kondo, M. C., Cheney, R. A., & Branas, C. C. (2015). Neighborhood blight, stress, and health: A walking trial of urban greening and ambulatory heart rate. *American Journal of Public Health*, *105*(5), 909–913. https://doi.org/10.2105/AJPH.2014.302526

Spielman, S. E., Yoo, E.-H., & Linkletter, C. (2013). Neighborhood contexts, health, and behavior: Understanding the role of scale and residential sorting. *Environment and Planning B: Planning and Design*, *40*(3), 489–506. 10.1068%2Fb38007

StataCorp. (2013). *Stata statistical software: Release 13*. StataCorp LP.

van Kamp, I., Persson, W. K., & Gidlöf-Gunnarsson, A. (2015). The effects of noise disturbed sleep in children on cognitive development and long term health. *Journal of Child and Adolescent Behavior*, *3*(179). https://doi.org/10.4172/2375-4494.1000179

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Additional supporting information can be found online in the Supporting Information section at the end of this article.

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