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Living alongside more affluent neighbors predicts greater involvement in antisocial behavior among low-income boys

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Abstract

Background—The creation of economically mixed communities has been proposed as one way to improve the life outcomes of children growing up in poverty. However, whether low-income children benefit from living alongside more affluent neighbors is unknown.

Method—Prospectively gathered data on over 1,600 children from the Environmental Risk (E-Risk) Longitudinal Twin Study living in urban environments is used to test whether living alongside more affluent neighbors (measured via high-resolution geo-spatial indices) predicts low-income children's antisocial behavior (reported by mothers and teachers at the ages of 5, 7, 10, and 12).

Results—Results indicated that low-income boys (but not girls) surrounded by more affluent neighbors had higher levels of antisocial behavior than their peers embedded in concentrated poverty. The negative effect of growing up alongside more affluent neighbors on low-income boys' antisocial behavior held across childhood and after controlling for key neighborhood and family-level factors.

Conclusions—Findings suggest that efforts to create more economically mixed communities for children, if not properly supported, may have iatrogenic effects on boys' antisocial behavior.

Keywords

Children's antisocial behavior; socioeconomic status; economic inequality; neighborhood poverty; economically mixed communities; sex differences

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Introduction

Children who grow up in high-poverty neighborhoods are at increased risk for a wide range of poor outcomes (Brooks-Gunn, Duncan, & Aber, 1997), including involvement in antisocial behavior and crime (Elliott et al., 1996;Leventhal & Brooks-Gunn, 2000). Impoverished neighborhoods have also been identified as potential training grounds for criminal behavior (Sampson, Morenoff, & Gannon-Rowley, 2002) and are believed to contribute to the intergenerational transmission of risk for poverty, crime and involvement with the justice system (Sharkey, 2013). One solution put forth by policymakers to counter the potentially toxic effects of living in high-poverty neighborhoods has been to encourage the creation of economically mixed communities. The assumption is that economically mixed neighborhoods would provide children from low-income families with greater access to prosocial peer groups, along with higher quality educational and recreational opportunities (Lees, 2008). In Britain, the creation of socially and economically mixed communities is a long-held and firmly established national policy aimed at achieving social equity and improving the life chances of low-income individuals (Berube, 2005). However, despite much enthusiasm regarding the benefits of economically mixed communities for residents, relatively little is known about whether this policy works and, importantly, whether it justifies the resources it consumes (Cheshire, 2007).

From the perspective of a child from a low-income family, living alongside more affluent neighbors may not be an entirely positive experience. On one hand, efforts to create economically mixed communities should offer low-income children opportunities and access to resources that may improve their life chances, including higher quality schools, increased safety, and greater access to prosocial peer groups. On the other hand, it is possible that children from low-income families may suffer ill effects as they grow up in the shadow of peers who have more resources, social capital, and perceived opportunities. Large-scale housing experiments have provided some information on how low-income children may respond to these settings. For example, the Moving to Opportunity (MTO) Study in the United States used housing vouchers to experimentally encourage moves among low-income residents from high-to-low poverty neighborhoods. Five years following the relocation, adolescent boys in the experimental group (but not girls) who were relocated to higher income neighborhoods were engaging in more antisocial behavior than their peers in the control condition (Kling, Ludwig, & Katz, 2005). Subsequent reports have documented a ‘fade out’ of this initial negative effect of the ‘move to opportunity’ on crime in adulthood (Sciandra et al., 2013). Nonetheless, these findings raise important questions about how low-income children, and especially boys, respond to living in economically mixed communities. Prior evidence suggests that boys may be more strongly influenced by neighborhood features than girls, in part because parents are reported to more closely supervise girls within high-risk neighborhoods and limit their exposure to these contexts (Leventhal & Brooks-Gunn, 2000). However, findings on this topic have been mixed, and very little is currently known about why low-income girls may be less affected by the neighborhoods that they live in.

This study

In this study, we leverage naturally occurring variation in the socioeconomic status (SES) and composition of local neighborhoods, captured over the course of a prospective and nationally representative longitudinal study, to test whether the economic distance between a low-income child and their neighbors (vs. poverty levels alone) influences their antisocial behavior. The neighborhood SES composition of over 1,600 children from the Environmental Risk (E-Risk) Longitudinal Twin Study living in urban environments was characterized using high-resolution geospatial indices. These indices were then linked to a rich archive of data on the children and their families over the 12 year study period. More specifically, we tested the hypotheses that:

1. living alongside more affluent neighbors would be associated with more antisocial behavior among low-income children,
2. living alongside more affluent neighbors would continue to predict low-income children's antisocial behavior after controlling for neighborhood and family-level factors that could otherwise explain the association,
3. growing up alongside more affluent neighbors would have stronger effects on low-income boys versus girls' levels of antisocial behavior, as initially suggested by findings from the MTO Study.

This study is novel in that: (a) study children are representative of the whole of Britain and were drawn from neighborhoods across the SES distribution, (b) high-resolution socioeconomic indices were available to characterize each family's local neighborhood, (c) children were assessed prospectively from birth through age 12 when 96% of the original study members participated, (d) unlike, many prior neighborhood studies, reports of neighborhood conditions and child behavior were not confounded by reporter bias as neighborhoods were assessed via resident surveys, census data, and virtual systematic social observations in Google-Street View, while parents and teachers provided reports of children's behavior problems, and, finally, (e) the rich longitudinal data archive on E-Risk Study children and their families provides a stringent set of controls for neighborhood and family-level factors that may otherwise explain the results. This study is also novel in that the long-standing commitment to economically mixed communities in Britain means that the majority of low-income children in our sample were living in economically mixed communities (e.g., housing conditions that are not typically observed in the United States), making it possible to test how low-income children fare when living alongside similarly deprived versus more affluent neighbors.

Methods

Participants

Participants were members of the Environmental Risk (E-Risk) Longitudinal Twin Study, which tracks the development of a nationally representative birth cohort of 2,232 British children. The sample was drawn from a larger birth register of twins born in England and Wales in 1994–1995 (Trouton, Spinath, & Plomin, 2002). Details about the sample have been reported previously (Moffitt, 2002). Briefly, the E-risk sample was constructed in

1999–2000, when 1,116 families with same sex 5-year-old twins (93% of those eligible) participated in home-visit assessments. Families were recruited to represent the UK population of families with newborns in the 1990s, based on (a) residential location throughout England and Wales, and (b) mother's age. Maternal age was used to (a) replace at-risk families selectively lost to the register, (b) achieve adequate numbers of children growing up in at-risk rearing conditions, and (c) undersample older well-educated mothers who had their twins by using assisted reproduction. Follow-up home visits were conducted when the children were aged 7 years (98% participation), 10 years (96% participation), and 12 years (96% participation). With parents' permission, questionnaires were mailed to the children's teachers, who returned questionnaires for 94% of children at age 5, 91% of the 2,232 E-risk children (93% of those followed up) at age 7, 86.3% of the 2,232 E-risk children (90.1% of those followed up) at age 10, and 80% of the 2,232 E-risk children at age 12 (83% of those followed up). The sample includes 55% monozygotic (MZ) and 45% dizygotic (DZ) twin pairs. Sex is evenly distributed within zygosity (51% female). Parents gave informed consent and children gave assent. The Maudsley Hospital and Duke University Ethics Committees approved each phase of the study.

For this study, data from 1,630 of the children living in suburban or urban neighborhoods were analyzed; 23% of children in the E-Risk Study were living in rural areas or small towns and were excluded as the low population density prevented the creation high-resolution SES indices.

Measures

Children's antisocial behaviors at ages 5, 7, 10, and 12 were assessed using the Achenbach family of instruments (Achenbach,1991a, 1991b), the most widely used and well-validated assessment scheme for assessing antisocial behavior problems among children and adolescents. Items from the Delinquent Behavior (e.g., 'lying or cheating' 'swearing or bad language') and Aggressive Behavior (e.g., 'hot temper', 'physically attacks people') scales of the Child Behavior Checklist (CBCL) and the Teacher Report Form were used. Mother interviews and teacher reports of children's behavior on the aggression and delinquency scales were combined by summing the items from each rater (scored 0–2). Due to the similarity in findings across ages and across aggressive versus delinquent types of behavior, the antisocial behavior scores were averaged to create a measure of *childhood antisocial behaviour*. Descriptive scale information is included in Table 1.

Geographical neighborhood boundaries—Research using accelerometers with school children in the United Kingdom indicates that a 0.5 mile radius captures the distance that they typically travel on foot during the day (Jones, Coombes, Griffin, & van Sluijs, 2009). As such, ArcGIS software was used to identify each of the Output Areas (OAs) within the 0.5 mile radius of the child's home. In Figure 1A the red dot corresponds with the study member's home address and each geometric shape represents an OA. OAs were created based on census data to capture clusters of adjacent unit postcodes with similar population sizes and socially homogenous indicators of tenure of household and dwelling type. OAs can represent a minimum of 40 households, but typically include 100–125 households.

Neighborhood socioeconomic status was measured using geodemographic discriminators developed by CACI Limited for commercial use in Great Britain. A Classification of Residential Neighborhoods (ACORN) assessment scheme was built using over 400 variables from the 2001 census (e.g. age, educational qualifications, unemployment, single-parent status, housing tenure and dwelling type) and an extensive consumer research database combined to give a comprehensive picture of socioeconomic differences between areas. Local areas were classified into five distinct and homogeneous ordinal groups ranging from 'wealthy achievers' (ACORN 1) with high incomes, large single-family houses, and access to many amenities, to 'hard pressed' neighborhoods (ACORN 5) dominated by government-subsidized housing estates, low incomes, high unemployment, and single parents. ACORN classifications were geo-coded to capture the SES of the street or immediately adjacent streets where the study member lived [depicted in Figure 1 by the OA in which the study member lived, and referred to in the tables as 'Neighborhood (same street) SES'] as well as the SES composition of the larger neighborhood (defined throughout as the 0.5 mile radius surrounding the children's home) (Odgers, Caspi, Bates, Sampson, & Moffitt, 2012). E-Risk families' ACORN distribution closely matches that of households nation-wide: 25.6% of E-Risk families live in 'wealthy achiever' neighborhoods compared to 25.3% nation-wide; 5.3% versus 11.6% live in 'urban prosperity' neighborhoods; 29.6% versus 26.9% live in 'comfortably off' neighborhoods; 13.4% versus 13.9% live in 'moderate means' neighborhoods; and 26.1% versus 20.7% live in 'hard-pressed' neighborhoods.

Children from low-income families were identified as living in an ACORN 4 or 5 Output Area and experiencing at least one of the following six economic hardships during childhood: (a) head of household had no educational qualifications, (b) head of household was employed in an unskilled occupation or was not in the labor force, (c) total household gross annual income was less than £10,000, (d) family was receiving at least one government benefit, excluding disability benefit, (e) family housing was government subsidized, and (f) family had no access to vehicle. Full details of E-Risk families' socioeconomic status are reported elsewhere (Kim-Cohen, Moffitt, Caspi, & Taylor, 2004). *Low-income children* comprised 38.9% of the study members living in urban or suburban neighborhoods. All other children in the sample are referred to throughout as 'nonpoor'.

A *Percent Neighborhood Deprivation* score was created for each child by computing the percentage of the total 2.03 km (area within a 0.5 mile radius) surrounding their home that was classified as ACORN level 4 (moderate means) or 5 (hard pressed). The resulting measure reflects a fraction of the neighborhood categorized by deprivation over the total area of the neighborhood, and ranges from 0% (no deprivation) to 100% (complete deprivation).

Figure 1B provides a visual example of the variability in the SES composition of children's neighborhoods. Both children depicted by the red dot in Figure 1B were living in a 'hard-pressed' (ACORN 5) OAs. However, the 0.5-mile radius of the area surrounding Child 1 is predominantly occupied by 'wealthy achievers,' (ACORN 1) while Child 2's local neighborhood is mostly composed of 'hard-pressed' areas (ACORN 5). Child 1 is positioned at the bottom of the SES distribution and is growing up alongside neighbors and peers with

greater wealth and resources, whereas Child 2 is living in concentrated poverty and alongside peers that are also struggling financially.

Covariates

All analyses controlled for neighborhood-level (SES, collective efficacy, and problems) and family-level (SES, mother and father's antisocial behavior history) factors. Table 1 provides descriptive and scale information for all covariates.

Neighborhood collective efficacy was assessed via the resident survey using a previously validated 10 item measure of social control and social cohesion (Sampson, Raudenbush, & Earls, 1997). Neighborhood survey respondents (N = 5,601) were typically living on the same street or within the same apartment block as E-Risk families. Surveys were returned by an average of 5.18 (SD = 2.73) respondents per neighborhood. At least three responses were received for 80% and at least two responses for 95%, of the neighborhoods (see: Odgers et al., 2009). Residents were asked about the likelihood that their neighbors could be counted on to intervene in various ways if, for example: 'children were skipping school and hanging out on a street corner,' 'children were spray-painting graffiti on a local building'. They were also asked how strongly they agreed that, for example: 'people around here are willing to help their neighbours,' 'this is a close-knit neighbourhood' (item responses: 0–4).

Neighborhood problems were also measured at the street or building level via the resident survey and asking whether residents saw various types of disorder and crime in their neighborhood as a problem, including: 'litter, broken glass, rubbish in public places?,' 'run-down buildings, abandoned cars, wastelands or vacant shop fronts?,' or 'vandals who do things like damage phone boxes, smash street lamps, break windows, or paint graffiti on walls?' The 10 items were summed to create a neighborhood problems total score (item responses: 0–2).

Parents' history of antisocial behavior was reported by mothers when children were 5 years old. Mothers completed a modified version of the Young Adult Behavior Checklist to assess both parent's lifetime antisocial behavior (Achenbach, 1997). Full details of father's and mother's history of antisocial behavior within this sample are reported elsewhere (Jaffee, Moffitt, Caspi, & Taylor, 2003). An E-Risk subsample study of mother–father agreement showed that women provided reliable information about the behavior of their children's father (Caspi et al., 2001). Including parents' history of antisocial behavior also helped to account for two important causes of antisocial behavior: familial genetic loading and parents' environmental influences (Moffitt et al., 2007).

Analyses

Analyses proceeded in four steps. First, children's home addresses were geo-coded and a 0.5 mile buffer was created around each residential marker. OA codes were overlaid onto the maps and ACORN SES measures were linked to the spatial information. For each family, we calculated the percentage of the area classified as 'poor' (ACORN 4 or 5) and the variability in SES present in the 0.5 mile radius around their home. Second, regression models were applied to test the hypothesis that growing up alongside more affluent

neighbors predicts more antisocial behavior among low-income children. Findings are reported separately for low-income versus nonpoor children alongside the full model that includes estimated main effects, interaction terms, and full neighborhood and family-level controls. Because each geo-coded household contained two study members (twins in the same household) the cluster command in Mplus Version 6.1 (Muthén & Muthén, Los Angeles, CA) was used to correct the estimated standard errors. Additional corrections for spatial dependency were not required as only a handful of E-Risk families lived in overlapping neighborhoods. Third, we tested whether the SES composition of the neighborhood continued to predict low-income children's antisocial behavior after controlling for factors that may otherwise confound the relationship. Fourth, sex-interaction terms were entered into the multiple regression models to test whether low-income boys' versus girls' antisocial behavior was more strongly influenced by growing up alongside more affluent neighbors.

Results

As shown in Figure 2, low-income children were living across a wide range of neighborhood types in Britain, ranging from the most affluent (where less than 25% of the area was classified as poor and where 11.6% of the low-income children lived) to areas of concentrated poverty (where more than 75% of the area was classified as poor and 18.1% of the low-income children lived). The majority of low-income children lived in neighborhoods that were relatively mixed, with over 80% of low-income children living in neighborhoods where less than 75% of the area was classified as poor.

Question 1. Does living alongside more affluent neighbors predict low-income children's antisocial behavior?

Yes, low-income children surrounded by more affluent neighbors engaged in *more* antisocial behavior than their peers embedded in concentrated disadvantage. As shown in Figure 3, low-income children in the most affluent neighborhoods in Britain (characterized by less than 25% poverty) exhibited significantly higher levels of antisocial behavior at age 5 (M = 32.89) than their peers living in concentrated poverty (M = 24.67). For each 10% increase in neighborhood poverty, children's antisocial behavior *decreased* by 1 symptom (b = .−99, β =−.12, p = .02). These findings held at ages 7(β = −.12, p = .02), 10 (β = −.12, p = .006) and 12 (β = −.08, p = .05), as well as for the average childhood antisocial behavior score (b = −.89, β =−.12, p = .01). Given similar findings across age, the average score for childhood antisocial behavior across ages 5 through 12 is reported in all subsequent analyses.[1] Results also did not vary when aggressive versus nonaggressive forms of behavior were considered separately. As such, results for the combined antisocial behavior scale are presented throughout.

[1]Similar findings emerged when latent growth curve models were used to test whether Percentage Neighborhood Poverty predicted the intercept (starting point) and slope (change over time) of antisocial behavior between 5 and 12 years. Therefore, for the ease of presentation, the average childhood antisocial behavior score is reported in all subsequent analyses.

Question 2. Does the negative statistical effect of living alongside more affluent neighbors on low-income children's antisocial behavior hold after considering other key risk factors?

Yes, as shown in Table 2 (Model 2), the negative effect of growing up alongside more affluent neighbors on low-income children's antisocial behavior holds after controlling for neighborhood (street level) SES, collective efficacy and neighborhood problems that characterize the Output Area where the child lived, as well as for family SES, parental history of involvement in antisocial behavior and child sex.

Question 3. Does growing up alongside more affluent neighbors more strongly influence antisocial behavior among low-income boys versus girls?

Table 2 displays the estimated effect of increasing concentrations of poverty on children's antisocial behavior for low-income boys versus low-income girls and depicts two main findings. First, increasing poverty concentrations within low-income boys' neighborhoods predicted lower levels of antisocial behavior ($b = -1.43$, $\beta = -.18$, $p = .02$) with no significant effect observed among low-income girls ($b = -0.44$, $\beta = -.08$, $p = .22$). Second, the effect of increasing concentrations of neighborhood poverty on low-income boys' antisocial behavior held after controlling for neighborhood and family-level factors (adjusted estimates: $b = -1.68$, $\beta = -.20$, $p < .01$) and was significantly different than the effects documented for girls across childhood (statistically significant interaction term not shown).

Although our three main study questions focused on the effects of growing up in mixed income communities on low-income children, we also asked whether the SES composition of children's neighborhoods predicted behavior among nonpoor children.

Does living in an economically mixed neighborhood influence nonpoor children?

For nonpoor children (all children not classified as low-income), increasing poverty concentrations in the local neighborhood were associated with *higher* levels of antisocial behavior ($b = .88$, $\beta = .15$, $p = .001$, $n = 976$) and held (at the $p = .06$ level) after controlling for neighborhood (SES, collective efficacy, problems) and family-level (family SES, parental history of antisocial behavior) factors (adjusted: $b = .54$, $\beta = .09$, $n = 968$). Estimates from the fully specified model evidenced a robust and statistically significant interaction between children's SES and the SES composition of local neighborhoods on children's antisocial behavior (see Table 3).

Discussion

Findings from this study advance what is known about the effects of growing up in economically mixed neighborhoods on children in three ways. First, we found evidence that low-income boys growing up alongside more affluent neighbors engaged in more antisocial behavior than their peers living in concentrated disadvantage. This finding held across childhood and after controlling for factors that may have otherwise explained the relationship. These results highlight a potentially iatrogenic effect of policy efforts directed at the creation of economically mixed communities and are consistent with a number of long-standing theories regarding how socioeconomically vulnerable individuals may fare in

economically mixed settings. For example, decades of research on social disparities and health have shown that frequent exposure to higher status individuals can negatively influence individuals' psychological wellbeing and health (Adler & Stewart, 2010). With respect to antisocial behavior, strain, and relative-deprivation based theories have long suggested that social comparisons and subsequent perceptions of unfairness and blocked goals may lead individuals to engage in delinquent behaviors (Agnew, 1992, 2001; Merton, 1968). Similarly, the relative position hypothesis (Kawachi & Kennedy, 1999; Wagstaff & Van Doorslaer, 2000; Wilkinson & Pickett, 2010) holds that individuals who are of lower status in their communities develop poor outcomes due to unfavorable social comparisons that cause the lower status individual to experience stress and negative emotions that, in turn, influence health and behavior. Notably, similar findings have been found in school-based research in the United States where Crosnoe (2009), for example, has documented how children from low-income families underperform in math and science when attending schools with a higher proportion of middle-to-high income students. These findings are consistent with the 'frog pond' perspective, also rooted in social comparison theories, whereby students evaluate their rank and worth based on the features of their immediate contexts, making low-income students potentially more vulnerable as the SES of their peers rises. In short, the educational analogy of creating economically mixed schools has uncovered some hidden risks for low-income children. By continuing to follow the E-Risk children into adulthood, we will be able to trace the potential effects of local area inequality on a wide range of future outcomes, including educational achievement and school attainment. Finally, predictions stemming from opportunity theory in criminology suggest that economically mixed communities may encourage crime in particular, by increasing the visibility and availability of high value targets, whereby potential offenders are assumed to engage in crime and select targets based on their ease of availability and value (Clarke & Felson, 1993). Future research will be required to determine whether, when and how, living alongside neighbors with greater economic resources influences children's outcomes.

Second, for children from nonpoor families, increases in exposure to neighborhood poverty were associated with higher levels of antisocial behavior; a relatively robust association that differed significantly in direction from relationships observed among low-income children. That is, for nonpoor children increasing concentrations of poverty predicted more antisocial behavior, whereas for low-income children increasing concentrations of poverty in the local area predicted less involvement in antisocial behavior. The differences in the effect of neighborhood SES composition on children's antisocial behavior across these two groups of children were significantly different across childhood and held after controlling for key neighborhood and family factors. If the fate of low-income children had not been considered separately, we would have reached the usual conclusion of neighborhood effects research that growing up in high-poverty neighborhoods is associated with more problem behaviors. Instead, our findings highlight the importance of considering whether the economic distance between children and their neighbors matters for their development. Our future work will query effects of neighborhood composition on other outcomes, such as secondary school completion, mental health and labor force outcomes and, in particular, on outcomes that may be more relevant to understanding the potential effects of neighborhood SES composition on girls.

Third, growing up alongside more affluent neighbors had a negative effect on antisocial behavior among low-income boys but had no observed effect among low-income girls. These findings are consistent with the interim MTO Study results documenting a negative effect of moving from a high-to-low poverty neighborhood on boys only (e.g., Kling et al., 2005). The primary explanation offered for why lower-income boys were more strongly affected in the MTO Study was that boys were more likely to take advantage of opportunities for property crime within their new higher resource neighborhoods (Kling et al., 2005). Qualitative interviews with these study participants also suggested that girls were more likely to spend time socializing in their homes or on their porches, whereas boys were more likely to found in public spaces (Clampet-Lundquist, Edin, Kling, & Duncan, 2011; Popkin, Leventhal, & Weismann, 2010). More generally, prior research has found stronger evidence for neighborhood effects on boys versus girls behavior (see Leventhal & Brooks-Gunn, 2000 for a discussion), suggesting that boys may experience more exposure to neighborhood features and/or be more sensitive to these influences when they occur. In this study, the effects of neighborhood SES composition on boys' antisocial behavior were relatively large, representing a decrease in almost 1.5 symptoms with each 10% increase in local area poverty, and were robust to other neighborhood and family-level controls. In contrast, no significant effects of neighborhood concentrations of poverty on low-income girls' antisocial behavior were found. Future research, relying, in part, on mixed-methods strategies will be required to understand how possible gender differences in the uses and interactions with neighborhood contexts could be protecting girls from these adverse effects and/or amplifying the effects of neighborhood conditions for boys (see e.g. Clampet-Lundquist et al., 2011).

This study also had limitations. First, we adopted a conservative approach to capturing the area around each child's home by using a .5 mile radius, or the distance that children of this age typically travel on foot in the United Kingdom. Future research is required to test whether our results are sensitive to modifications of neighborhood boundaries and to determine whether the *amount* of variability in income (or inequality) within local areas influences children.

Second, it is possible that the neighborhood composition may change over time – both due to families moving and neighborhoods changing. However, unlike the high levels of residential mobility among low-income families in the United States, there was relatively little mobility among our sample of British children. The vast majority (86%) of the families remained in the same or adjacent postcode across childhood, with, for example, only 4% of nonpoor and 6% of low-income children moving address between age 10 and 12. As such, we are currently unable to evaluate differences in outcomes between 'movers' versus 'stayers' in our sample.

Third, families are not randomly assigned to neighborhoods and we are limited in our ability to test whether neighborhood SES composition is causally related to children's behavior. Experimental and quasi-experimental work that leverages variation in housing and related policies will be required to fully test the robustness and generalizability of these findings.

Fourth, the children in this study were twins and families with twins may experience unique financial pressures (Spillman, 1987). Although prior research has shown that twins and singletons do not differ on their mean levels of behavioral problems and that the association between neighborhood factors and children's mental health outcomes are similar across singleton versus twin samples (for a fuller discussion see: Kim-Cohen et al., 2004), replication of our findings among singletons is required.

The World Health Organization's Commission on Social Determinants of Health (CSDH, 2008) recently called stakeholders to action to reduce social inequalities within a generation. However, current trends suggest that the gap between the rich and the poor is expected only to widen, with unprecedented levels of economic inequality documented in both the United States and the United Kingdom (Piketty & Saez, 2014). This is important as both countries recently ranked at the bottom of 21 nations in the industrialized world on indices of child wellbeing, with subsequent comparisons demonstrating a strong linear association between levels of income inequality within each country and children's wellbeing (Pickett & Wilkinson, 2007). While it is well-established that unequal societies (Wilkinson, Pickett, & Chafer, 2011) and poor neighborhoods (Caspi, Taylor, Moffitt, & Plomin, 2000; Sampson, 2012) can be a harmful places for children to grow up, less is known about how inequality at the neighborhood level can influence children (see the following for recent examples of state level analyses: Kearney & Levine, 2014; Olson, Diekema, Elliott, & Renier, 2010).

While there is a long history of policy efforts and commitment to creating economically mixed housing in the United Kingdom, the United States has, generally, lacked a consistent policy commitment in this area (Berube, 2005). From a research perspective, the more extreme levels of disadvantage and residential segregation in the United States has made it difficult to evaluate how low-income children fare when they grow up in economically mixed communities, as this type of residential mixing is relatively uncommon (for important exceptions see: Popkin et al., 2004). As such, our UK based study presents an unique opportunity to document how low-income children fare in these contexts without physically removing them from their neighborhoods (as was done in the MTO Study occurs during many housing renewal projects in the United Studies). From a policy perspective, the more severely deprived concentrations of housing in the United States has resulted in the need for a more transformative approach to creating mixed communities involving, literally, the breaking down of low-income housing units (see e.g., the HOPE VI Program aimed at de-concentrating poverty). Despite the differing levels of concentrated poverty and policy instruments used to encourage the creation of mixed-income communities across the United States and the United Kingdom, important questions remain as to whether these efforts will achieve their intended results of improving the life chances of low-income children in either context.

In this study we present evidence that, for low-income children, poverty levels alone may not tell the entire story of how neighborhoods influence children's development. Rather, it is important to also consider the *economic distance* between children and their neighbors when estimating neighborhood effects. Our finding that low-income children do worse when surrounded by more affluent neighbors is troubling as the creation of economically mixed communities is seen by many as a possible solution to the intractable and growing problem

of income inequality and the ill effects associated with growing up in concentrated poverty. This is not to say that policies that promote the economic mixing of neighborhoods or other settings for children are universally harmful. Rather, our findings suggest that careful attention should be paid to the potential iatrogenic effects of policies directed at the creation of mixed communities versus assuming that children will automatically benefit. Forewarned is forearmed.

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Key points

- The creation of socially and economically mixed communities is a firmly established national policy in Britain aimed at achieving social equity and improving low-income individuals' life chances. Despite broad support, there is little evidence that 'mixing' communities improves the lives of children.
- Children from the Environmental Risk Longitudinal Twin Study were followed from birth through age 12 via repeated in-home and community-level assessments.
- We found that low-income boys (but not girls) engaged in more antisocial behavior when living alongside more affluent neighbors; an effect that held even after controlling for other key neighborhood and family-level factors.
- Findings suggest that efforts to create more economically mixed communities may have iatrogenic effects on low-income boys and that additional supports may be needed if these policies are to work as intended.

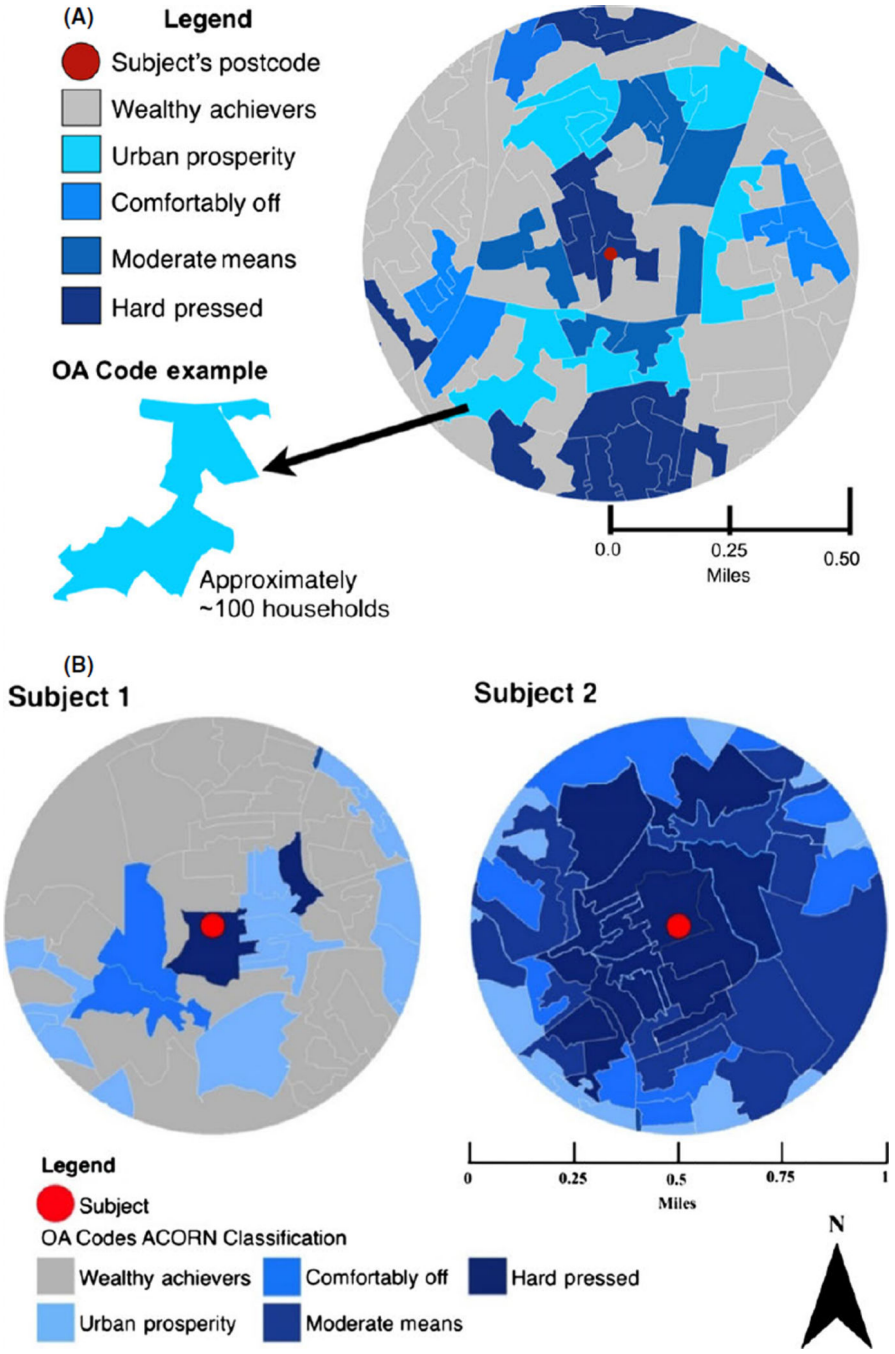

Figure 1.

(A) provides an illustration of a .5 mile radius around the study member's home with each shape representing a separate Output Area and the differing colors representing the varying socioeconomic classifications of each area. The main independent variable, Percentage Area Deprivation, represents the percentage of this area that is classified as a 4 or 5 on the ACORN scale. The neighborhood SES measure included in the regression models represents the ACORN score for the Output Area where the study member lived. Resident surveys measuring collective efficacy and neighborhood problems were completed by neighbors

living on the same street or on adjacent streets as the children in our sample (typically within the same OA). (B) provides an illustration of the diverse types of neighborhoods that low-income children in our study were living in, ranging from some of the most affluent neighborhoods in Britain (child 1) to some of the most disadvantaged neighborhoods in Britain (child 2)

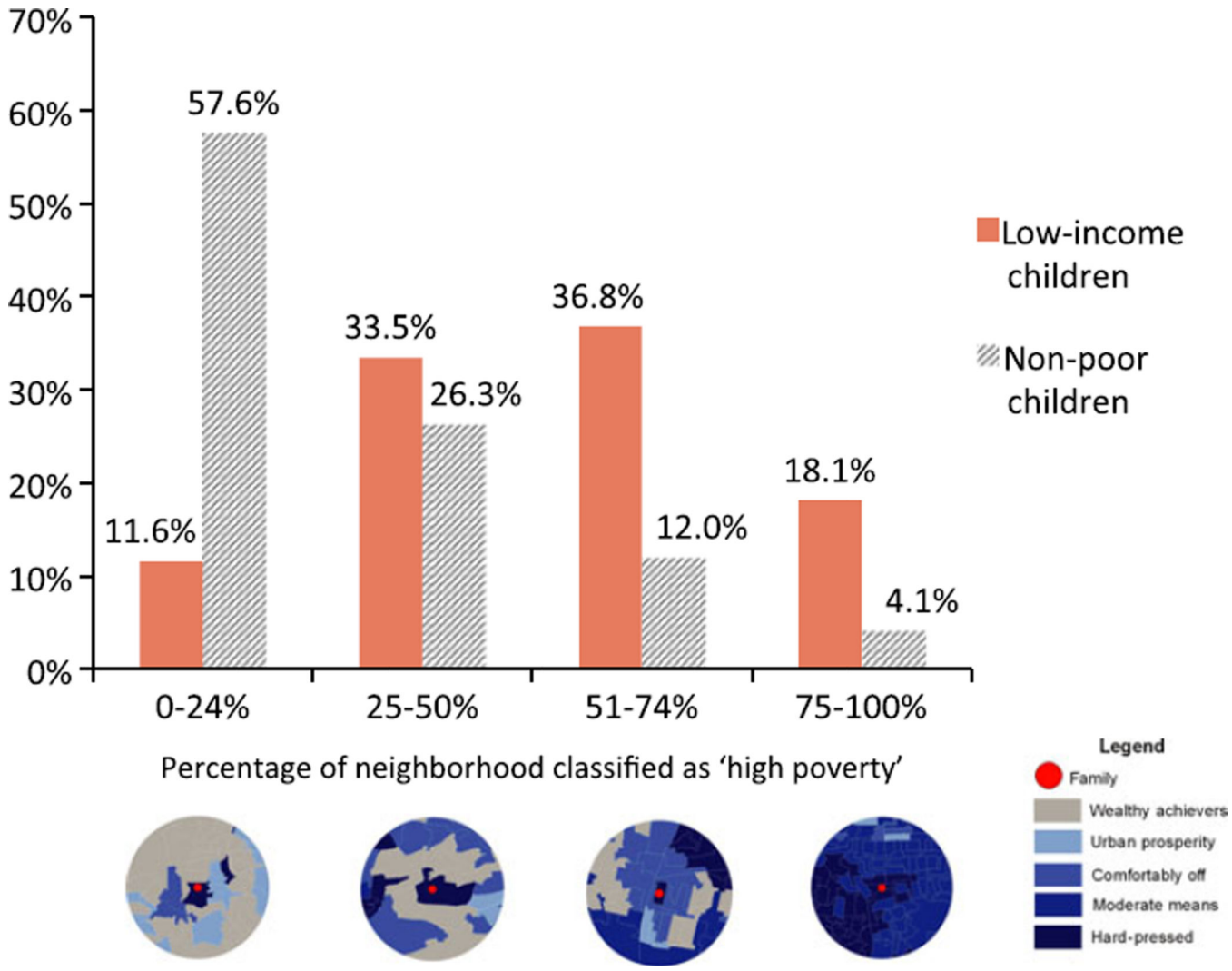

Figure 2.

Low-income children (shown in red) were distributed across a wide range of neighborhood SES types, with poverty classifications ranging from 0% to 100%

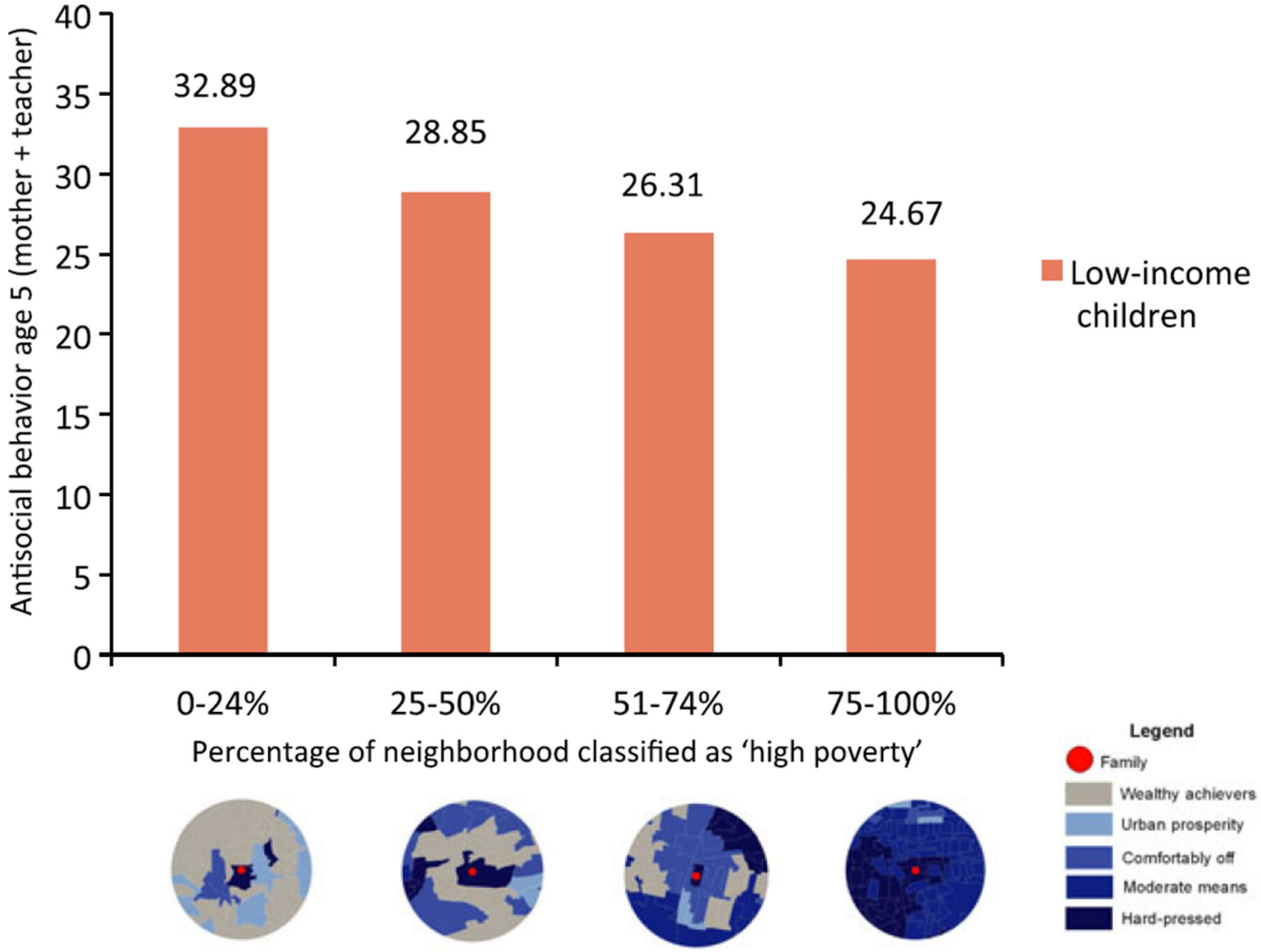

Figure 3.

Low-income children living alongside more affluent neighbors had higher levels of antisocial behavior than their low-income peers living in concentrated poverty

Table 1

Low-income versus nonpoor children's antisocial behavior, neighborhood, and family-level risk factors

Measure	Low- income children (*n* = 634) *M* (*SD*)	Nonpoor children (*n* = 996) *M* (*SD*)	Scale alpha
Antisocial behavior, age 5	27.53 (18.8)	20.69 (16.2)	.94
Antisocial behavior, age 7	24.84 (19.4)	18.03 (16.0)	.95
Antisocial behavior, age 10	25.11 (20.3)	16.55 (15.4)	.92
Antisocial behavior, age 12	24.71 (20.3)	16.77 (16.3)	.93
Childhood antisocial behavior, ages 5–12	25.55 (16.6)	18.07 (13.5)	–
Percentage area deprivation	51.7 (23.0)	25.0 (22.4)	–
Neighborhood (same street) ACORN SES	4.42 (0.9)	2.61 (1.3)	–
Neighborhood collective efficacy	20.55 (5.1)	23.9 (4.5)	.88
Neighborhood problems	11.35 (5.7)	7.29 (4.9)	.92
Family SES disadvantage	3.01 (1.5)	0.58 (1.2)	.79
Maternal antisocial behavior	1.03 (1.5)	0.51 (1.0)	.95
Paternal antisocial behavior	2.25 (2.3)	1.06 (1.7)	.95

Table 2

Growing up alongside more affluent neighbors continues to predict more antisocial behavior among low-income children after controlling for key neighborhood and family factors, with effects observed among boys only

	Entire sample		Boys only		Girls only	
	Model 1 Bivariate β (*SE*)	**Model 2 Neighborhood + family β (*SE*)**	**Model 1 Bivariate β (*SE*)**	**Model 2 Neighborhood + family β (*SE*)**	**Model 1 Bivariate β (*SE*)**	**Model 2 Neighborhood + family β (*SE*)**
Percentage area poverty	−.12 (.05)*	−.11 (.05)*	−.18 (.07)*	−.20 (.07)**	−.08 (.06)	−.03 (.07)
Neighborhood (same street) SES		−.05 (.05)		−.07 (.06)		−.02 (.08)
Neighborhood collective efficacy		.00 (.05)		.06 (.08)		−.11 (.06)
Neighborhood problems		.07 (.05)		.12 (.09)		−.03 (.07)
Family socioeconomic status (to parallel the labels used below)		.09 (.05)		.19 (.07)**		−.01 (.08)
Maternal antisocial behavior		.26 (.07)***		.34 (.09)***		.16 (.11)
Paternal antisocial behavior		.06 (.07)		.01 (.08)		.16 (.15)
Sex		.27 (.05)***		–		–
n	612	608	298	296	314	312

* $p < .05$;

** $p < .01$;

*** $p < .001$.

Table 3

Full model estimating the main and interaction effects of Percentage Area Poverty and Child Low-Income Status on antisocial behavior across childhood

	Model 1 Bivariate β (*SE*)	**Model 2 Main effects, plus interaction β (*SE*)**	**Model 3 Main effects, interaction and controls β (*SE*)**
Percentage area poverty	.14 (.03)***	.15 (.04)***	.09 (.05)*
Low-income child		.16 (.07)***	.26 (.09)**
Percentage Area 9 low-income child (interact)		−.14 (.08)***	−.27 (.08)**
Neighborhood (same street) SES			−.04 (.04)
Neighborhood collective efficacy			.01 (.03)
Neighborhood problems			.06 (.04)
Family socioeconomic status			.18 (.05)***
Maternal antisocial behavior			.18 (.05)***
Paternal antisocial behavior			.07 (.04)
Sex			.25 (.03)***
n	1,616	1,588	1,576

* $p < .05$;

** $p < .01$;

*** $p < .001$.