
The Environment of Childhood Poverty

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Poor children confront widespread environmental inequities. Compared with their economically advantaged counterparts, they are exposed to more family turmoil, violence, separation from their families, instability, and chaotic households. Poor children experience less social support, and their parents are less responsive and more authoritarian. Low-income children are read to relatively infrequently, watch more TV, and have less access to books and computers. Low-income parents are less involved in their children's school activities. The air and water poor children consume are more polluted. Their homes are more crowded, noisier, and of lower quality. Low-income neighborhoods are more dangerous, offer poorer municipal services, and suffer greater physical deterioration. Predominantly low-income schools and day care are inferior. The accumulation of multiple environmental risks rather than singular risk exposure may be an especially pathogenic aspect of childhood poverty.

Researchers in public health, medicine, and more recently, psychology have come to appreciate the value of studying poverty in its own right. Initially this meant descriptive analyses demonstrating physical and psychological sequelae of poverty or low socioeconomic status (SES; Aber, Bennett, Conley, & Li, 1997; Adler, Boyce, Chesney, Folkman, & Syme, 1993; Bradley & Corwyn, 2002; Chen, Matthews, & Boyce, 2002; Duncan & Brooks-Gunn, 1997; Huston, McLoyd, & Garcia Coll, 1994; Luthar, 1999; McLoyd, 1998; Williams & Collins, 1995). But psychologists have begun to move beyond a social address perspective, turning their attention to underlying explanations for poverty's harmful impacts on children and their families. A limitation of psychological research on poverty is the absence of an ecological perspective—that is, recognizing that the answer to why poverty is harmful probably does not lie with any one underlying agent or process (Bronfenbrenner & Morris, 1998). Psychologists are aware of the multiple disadvantages accompanying low income in America. Yet the search for explanatory processes of poverty's impacts on children has focused almost exclusively on psychosocial characteristics within the family, particularly negative parenting (Bornstein & Bradley, 2003; G. H. Brody et al., 1994; Conger & Elder, 1994; Luthar, 1999; McLoyd, 1998).

This focus on psychosocial processes is limited in two respects. First, psychological research on poverty has largely ignored the physical settings that low-income chil-

dren and families inhabit. Families reside in both a social and a physical world (Bradley, 1999; Evans, Kliever, & Martin, 1991; Parke, 1978; Wachs, 2000; Wohlwill & Heft, 1987), and each has well-documented impacts on human development. Second, poor children face a daunting array of suboptimal psychosocial and physical conditions. Many adverse physical and psychosocial conditions covary and do not occur in isolation. The quality of physical and social living conditions is not randomly distributed in the population (Schell, 1997). Cumulative rather than singular exposure to a confluence of psychosocial and physical environmental risk factors is a potentially critical aspect of the environment of childhood poverty.

Herein I document the wide array of suboptimal physical and psychosocial conditions that low-income children face. I focus on income and childhood environmental risk except in cases where useful social class data are available. These cases are clearly noted. I briefly summarize evidence for the pathogenic influence of each of these singular, income-related physical and psychosocial childhood risk factors and then argue that exposure to multiple stressors may be a unique, key feature of the environment of childhood poverty. I do not review evidence on the impacts of poverty on human development in this article. Both space limitations and recent reviews on the psychological (Bradley & Corwyn, 2002; Duncan & Brooks-Gunn, 1997; Huston et al., 1994; Luthar, 1999; McLoyd, 1998) and physical (Aber et al., 1997; Chen et al., 2002) health impacts of poverty and SES on children preclude the need for doing so.

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The Psychosocial Environment of Childhood Poverty

Low-income children in comparison to middle-income children are exposed to greater levels of violence, family disruption, and separation from their family. Household income is inversely related to exposure to familial violence (Emery & Laumann-Billings, 1998) and the incidence of crime within one's neighborhood (Sampson, Raudenbush, & Earls, 1997). Contact with aggressive peers is related to social class (parental education and occupation) in a study of preschoolers in three U.S. metropolitan areas (Sinclair, Pettit, Harrist, Dodge, & Bates, 1994). For example, low-relative to middle-class two- to four-year-olds interact with aggressive peers 40% more often in their neighborhood, 25% more often in child-care settings, and have 70% more contacts with friends who are aggressive (Sinclair et al., 1994). Neighborhood disadvantage (multiple indicators including poverty), net of household income, is positively associated with affiliation with deviant peers among pre-adolescents (G. H. Brody et al., 2001).

Poor children are more likely to spend a week or more in foster or other institutional care (Rutter, 1981), and they are substantially more likely to live in a family where divorce has occurred (U.S. Census Bureau, 2000; see Table 1).¹ The divorce rate in a nationwide analysis of unskilled workers in British families is four-and-a-half times the rate for skilled and white collar workers (Reid, 1989). The latter two data sets are also noteworthy because they reflect representative, national data sets. Most data on poverty and environmental risk are from convenience samples and thus may not be representative. For several risk factors, however, results from multiple convenience samples converge.

Another limitation of the database on childhood poverty and risk is the absence of statistical analyses beyond

descriptive data as presented herein (see Bradley, Corwyn, McAdoo, & Coll, 2001; Grant et al., 2003) for some notable exceptions. This occurs because income is typically incorporated as a statistical control (i.e., covariate), with the focus of inquiry on other variables. Although information on statistical significance or effect sizes is not typically presented, the magnitude of income-related differences in risk exposure as reported herein is frequently so great that further statistical analyses seem superfluous. Table 1 is a good example of this point.

A likely pathway linking poverty and family separation is marital quality. Numerous large-scale studies, including some with nationally representative samples, have demonstrated positive associations between family income and marital quality (e.g., Lewis & Spanier, 1979). More microanalyses have revealed that couples, particularly husbands, facing financial pressure suffer greater conflict and less warmth and support in their marital relationships (Conger & Elder, 1994).

Unresponsive and harsher, more punitive parenting occurs more often among low-income families, beginning as early as infancy (Conger & Elder, 1994; Magnusson & Duncan, 2002; McLoyd, 1998). In a nationwide study, 85% of American parents above the poverty line were responsive to their young children (from newborns to three-year-olds), compared with 74% of parents in low-income homes (Bradley et al., 2001). Similar income-related gaps in parental responsiveness to older children were uncovered. Furthermore, another national data set indicates that the longer the duration of poverty, the stronger the link between poverty and harsher, less unresponsive parenting (Miller & Davis, 1997). A recent meta-analysis has revealed a strong and consistent negative relation ($d \pm = .48, .55$, for cross-sectional and longitudinal studies, respectively) between socioeconomic disadvantage and harsh, less responsive parenting (Grant et al., 2003). Table 2 illustrates differences in several dimensions of parent-child interaction across social class from a longitudinal study of American kindergartners through third graders (Dodge, Pettit, & Bates, 1994). Comparable class differences have been found in a large national study in Britain (Reid, 1989). Both lower job status and parental education levels are significantly related to elevated parental rejection of adolescents (Felner et al., 1995).

In a remarkable research program, John and Elizabeth Newson (1963, 1968, 1976, 1977) have chronicled developmental sequelae of social class among a large sample of preschool and primary school children growing up in a midsized British city. For example, parents in unskilled worker families were nearly twice as likely (40%) to frequently rely on corporal punishment for seven-year-olds than parents in professional families (21%). The latter were nearly six times more likely (57%) than the former (10%) to use responsive, child-centered parenting practices. Similar trends were noted among these families when the child

¹ Statistical significance data are reported in the tables and figures when available.

Table 1*Percentage of Children Under 18 With Household Head Divorced, Separated by Household Income Quintiles*

Household income quintiles				
First ($< \$21,844$)	Second (\$21,845–\$39,000)	Third (\$39,001–\$58,026)	Fourth (\$58,027–\$86,320)	Fifth ($> \$86,321$)
25.4	16.9	11.9	8.3	5.7
27.9	17.5	11.5	7.0	4.4

Note. Percentiles in row 1 are adjusted for household size (household income divided by the square root of the number of individuals in the household). Percentiles in row 2 are unadjusted by household size. Tabulation by Andrew Houtenville. Adapted from Table 3 in *Population Survey (March Supplement)*, 162, U.S. Census Bureau, 2000, Washington, DC: U.S. Government Printing Office.

was four years old. Two additional class differences in parenting quality noted by the Newsons are noteworthy. Newson and Newson (1968) recorded maternal responses to the following query: "What sort of things make you get on each other's [your four-year-old's] nerves?" Four percent of mothers in unskilled laborer families indicated awareness of the possibility that they could get on their four-year-old's nerves; comparable figures ranged from 10% to 18% for mothers in skilled laborer and professional families. Parental monitoring also varied significantly by social class. Nine percent of professional class families could not locate their child in the neighborhood when needed; this compared with 17% of the families of unskilled workers (Newson & Newson, 1976). In a national study, low-income American parents of eighth graders compared with middle-income parents knew significantly fewer of the parents of their children's friends (Lee &

Croninger, 1994). Linkages between class and parenting may be influenced by parental working conditions. Fathers in jobs that are less complex and have lower decision latitude tend to encourage conformity and discourage self-directedness in their children (Kohn, 1977; Luster, Rhoades, & Haas, 1989).

Numerous national studies have revealed that low-income American households have smaller social networks, fewer organizational involvements, and less frequent contact with social network members compared with families that are not poor (House, Umberson, & Landis, 1988). Parallel results have been reported when comparing white and blue collar workers in the United States and three Northern European countries (Cochran, Lerner, Riley, Gunnarson, & Henderson, 1990).

In addition to income and class differences in social networks, perceived social support also relates to poverty. Unemployment is associated cross-sectionally and prospectively with lower social support within the family (Atkinson, Liem, & Liem, 1986), and familial social support is inversely related to income and parental education level in the general population (Conger & Elder, 1994; Wright, Treiber, Davis, Bunch, & Strong, 1998, respectively). Social support among clinically depressed adults is inversely related to education levels as well (Mitchell & Moos, 1984). As indicated in Table 2, mothers of lower SES offered less emotional support to their young children. This same longitudinal survey of American families also uncovered greater instability in peer relationships from preschool through third grade in relation to lower SES (Dodge et al., 1994). Among the children of British unskilled laborers, 22% in the Newsons' study (Newson & Newson, 1976) never had friends come over to play in their home, compared with 4% of the children of professional families. Poor parents are also much less likely to receive social support than their more economically advantaged counterparts. Poor women two to four weeks postpartum received less emotional support than middle- and upper-income mothers of newborns (Turner & Noh, 1983). Low-income mothers of low birth weight, premature babies in a national sample received significantly less social support when their child was one year old compared with their

Table 2*Parent-Child Interactions and Social Class in the United States*

Variable	Socioeconomic status				
	I	II	III	IV	V
Harshness of discipline (1–5)	2.64	2.43	2.11	1.90	1.89
Mother social support (1–5)	2.48	2.91	3.05	3.19	3.54
Mother warmth (0–12)	9.3	10.0	10.2	10.7	10.2
Cognitive stimulation (0–4)	1.29	2.18	2.36	2.93	2.87

Note. Socioeconomic status (SES) is measured by the Hollingshead Four Factor Index (mother's and father's education). The roman numerals refer to the Hollingshead Classification of SES. The numbers in parentheses represent the range on each scale. All of the parent-child interactions are associated with social class ($p < .001$). Adapted from Table 3 in "Socialization Mediators of the Relation Between Socioeconomic Status and Child Conduct Problems," by K. A. Dodge, G. Pettit, and J. Bates, 1994, *Child Development*, 65, p. 657. Copyright 1994 by the Society for Research in Child Development. Adapted with permission.

counterparts who were not poor (Liaw & Brooks-Gunn, 1994).

Lower social class (parental education and occupation) adolescents have smaller social support networks and are more dependent upon their peers than upon adults for social support (Bo, 1994). As an illustration, among 16-year-old boys, social class was negatively associated with social network size ($r = -.30$) and time spent with parents ($r = -.25$) and positively related to time spent with peers ($r = .23$) (Bo, 1994). Adolescent boys whose families previously lost at least 35% of their income during the Great Depression were significantly more dependent upon their peer group compared with youths from families who had not suffered such economic losses (Elder, van Nguyen, & Caspi, 1995).

Social resources also vary by neighborhood quality. Disadvantaged neighborhoods have less social capital than wealthier neighborhoods. Across multiple urban sites with representative samples, residents of disadvantaged neighborhoods compared with their more advantaged counterparts (e.g., percent unemployed, percent in poverty, percent with inadequate housing, percent single head of household) have weaker social ties, experience less interpersonal trust and norms of reciprocity, and perceive lower levels of instrumental support and mutual aid (Kawachi, 1999; Leventhal & Brooks-Gunn, 2000; Sampson et al., 1997). Poor neighborhoods have fewer social resources and diminished capacity for informal social controls. Neighborhood disadvantage accounts for more than 70% of the variance in informal social control across different urban neighborhoods in Chicago and about one third of the variance in social integration (Sampson et al., 1997). Adolescents in a representative sample of Los Angeles who live in poorer neighborhoods (median income, percent below poverty line, percent nonmanagerial occupations) experienced less social cohesion in their neighborhoods compared with those in more affluent neighborhoods (Aneshensal & Swoff, 1996).

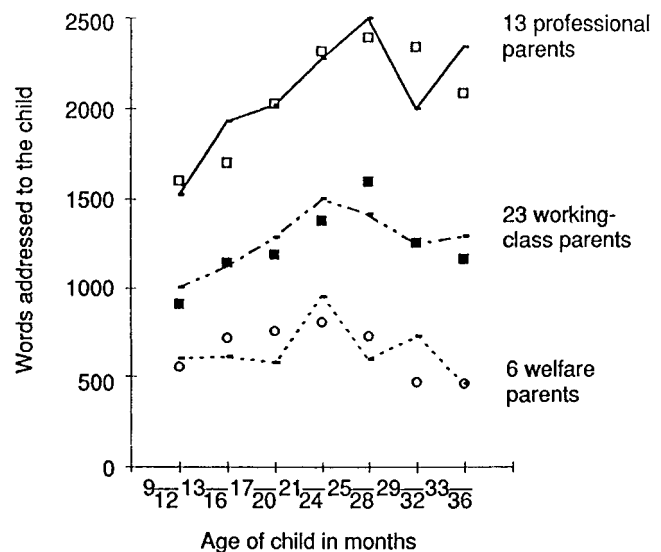
Low-income children experience substantially less cognitive stimulation and enrichment in comparison to wealthier children. Low-income compared with middle-income parents speak less often and in less sophisticated ways to their young children, and as the children grow older, low-income parents are less likely than middle-income parents to engage jointly with their children in literary activities such as reading aloud or visiting the library. Kagan and Tulkin (1971) observed mother–daughter interactions among 60 low- and middle-class 10-month-olds. Class was defined by parental occupation and education. Middle-class mothers spent twice as much time in face-to-face interaction with their infants, talked to their daughters for significantly longer intervals, and were substantially more likely to focus vocalizations to their child without providing competing sensory input. In an extraordinary study, Hart and Risley (1995) observed parent–child verbalizations once per month from 6 months to 3 years of age among 42 families. Observations in the home revealed highly significant and consistent class differences. Class was defined by occupational status (welfare, lower/middle,

professional), which was highly correlated with income and parental education. The quantity, quality, and responsiveness of parental speech to children varied strongly by class. Figure 1, an illustration of Hart and Risley's data, shows a fourfold difference in the amount of parental verbalizations to children in families on welfare versus professional families. Similar class differences were also found for speech quality (e.g., nouns, modifiers per utterance) and for verbal responsiveness of parents to children's verbal and nonverbal behaviors.

Hart and Risley (1995) also found that social class is inversely related to the function of parental speech. The higher the social class of parents, the less likely they are to direct or order their children's behaviors and the more likely they are to speak to their children in order to initiate and sustain conversation. Similar SES trends (parental education and occupation) have been shown by Hoff, Laursen, and Tardiff (2002) in a larger sample studied at ages two and four-and-a-half, both at home and in the laboratory. Moreover, significant positive relations between SES and two-year-olds' growth in productive vocabulary over time were largely accounted for by shorter utterances of parental speech among lower class mothers (Hoff, 2003).

In a representative American sample, 38% of low-income parents read to their 3–5-year-old children daily, and 22% have taken their children at least once in the past

Figure 1
Parent–Child Speech in Relation to Social Class



Note. The horizontal axis equals age of the child in months; the vertical axis equals words to the child per hour. Lines connect even-numbered months; squares and circles mark odd-numbered months. Each point shows the average of two months. From *Meaningful Differences in the Everyday Experiences of Young American Children* (Figure 7, p. 239) by B. Hart and T. R. Risley, 1995, Baltimore: Paul H. Brookes Publishing Co. Copyright 1995 by the Paul H. Brookes Publishing Co. Reprinted with permission.

month to the public library. Comparison figures for families above the poverty line are 58% and 40%, respectively (Federal Interagency Forum on Child and Family Statistics, 2000). In a nationwide study of American kindergarten children, 36% of parents in the lowest-income quintile read to their children on a daily basis, compared with 62% of parents from the highest-income quintile (Coley, 2002). Comparable class differences in reading and library activities were found by the Newsoms in their studies of British primary school children (Newsom & Newsom, 1968, 1976, 1977). Children in low-income families also watch considerably more television than their more affluent counterparts (Larson & Verma, 1999). For example, 18% of low-income American 13-year-olds watch more than six hours of television daily, whereas 10% of 13-year-olds above the poverty line watch this much (U.S. Department of Health and Human Services, 2000).

Parental involvement in school activities is strongly linked to income. In a national survey, 59% of American parents above the poverty line were involved in three or more school activities on a regular basis; this contrasts with 36% of parents below the poverty line (U.S. Department of Health and Human Services, 1999). Better educated mothers of eighth graders monitor their children's school experiences more closely than their less educated counterparts. For example, they are more likely to know their child's teachers by name, can more accurately identify their child's best and worst subject, and more often know how well their child is performing in classes (Baker & Stevenson, 1986). Ethnographic research in 16 elementary and middle schools in California revealed parallel trends (Benveniste, Carnoy, & Rothstein, 2003). Parents in low-income communities volunteered less, attended school functions relatively infrequently, and were typically inattentive to homework and other assignments compared with the parents of children from middle- and upper-income communities.

Adolescents in lower SES (education and occupation) families feel less of a sense of belonging to their school vis-à-vis adolescents in middle and upper SES families (Felner et al., 1995). Multilevel analyses of national data from American middle and high school students reveal evidence that disadvantages at both the individual household level and at the school level are associated with feeling less connected to school (McNeely, Nonnemaker, & Blum, 2002). For example, adolescents from single-parent families and those attending schools with a higher proportion of single-parent families felt less connected to their school.

Children in low-income schools are also less likely to have well-qualified teachers. For example, 27% of high school math teachers in low-income school districts major in mathematics in college. This contrasts with the 43% of high school mathematics teachers in more affluent school districts (Ingersoll, 1999). Student absenteeism and teacher turnover are greater in low-income schools (Lee & Croninger, 1994; Rutter et al., 1974), and as noted earlier, there is much less parental involvement in low-income schools (Lee & Croninger, 1994; U.S. Department of Health and Human Services, 1999). The incidence of violence is

greater in low-income American schools as well. A nationwide study has shown that low-income adolescents are twice as likely as middle-income adolescents to report the presence of weapons (12%) or the incidence of physical assaults (32%) in their schools (Gallup, 1993). Access to school itself in much of the Third World is tied to family economic resources. Many poor children are forced to work (Bartlett, Hart, Satterthwaite, de la Barra, & Missiar, 1999).

In terms of day-care facilities, two different national data sets have indicated that the ratio of children to caregivers is lower in predominantly high-income centers (National Institute of Child Health and Human Development Early Child Care Research Network, 1997; Phillips, Voran, Kisker, Howes, & Whitbook, 1994). Although early childhood day-care subsidies have partially offset low-income deficiencies in day-care offerings, inequities remain. For example, in low-income centers, caregivers show less warmth, responsiveness, and sensitivity to children's needs (Phillips et al., 1994) (see Figure 2). In-depth qualitative work has revealed that staff in low-income centers speak to children in more authoritarian and less cognitively complex ways than do staff in middle-income centers (Ferris Miller, 1989). For example, staff in predominantly low-income centers use verbal commands more often and are less likely to direct questions to toddlers that encourage answers.

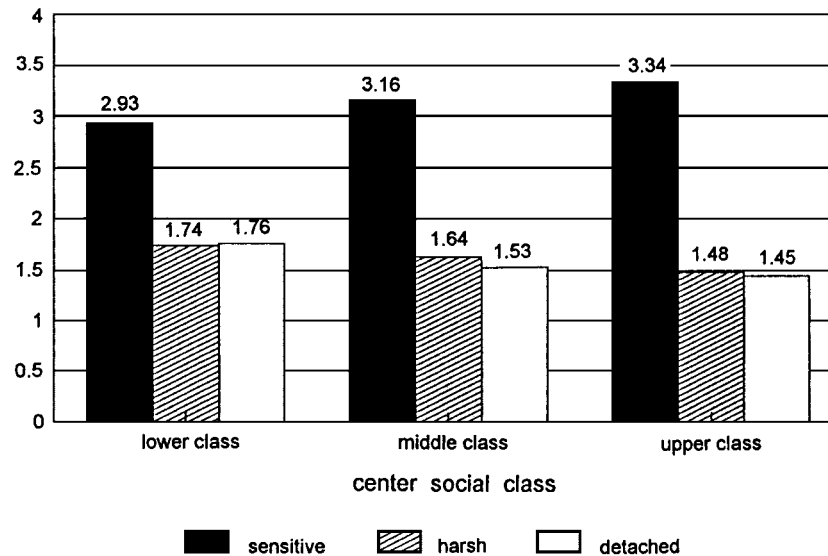
A prerequisite for security in young children's lives is constancy and predictability in the immediate environment. Several national data sets have shown that children who live at or below the poverty line in America change residences more than twice as often and are five times more likely to be evicted in a given year than children who do not live in poverty (Federman et al., 1996). A representative sample of Canadian households with children showed that household income is inversely associated with changes in day-care arrangements, changes in schools, and residential relocations (Kohen, Hertzman, & Wiens, 1998). Insecurity of housing tenure is unfortunately normative for millions of the poorest children in economically underdeveloped countries (Bartlett et al., 1999). Daily life within the immediate households of low-income American families (G. H. Brody & Flor, 1997; Jensen, James, Boyce, & Hartnett, 1983) and lower class (occupation) families (Matheny, Wachs, Ludwig, & Phillips, 1995) is more chaotic relative to nonpoor or higher occupational status households, respectively, with fewer routines and less structure.

The Physical Environment of Childhood Poverty

Although the term *environment* within psychology typically means the psychosocial milieu, there is stark evidence of physical, environmental injustice among the poor in America. Low-income families live closer to toxic waste dumps (Bullard & Wright, 1993), and their children carry a heavier body burden of toxins. As an illustration, the prevalence of unsafe lead levels in American children from a national survey was four times higher in low-income families (16.3%) than in high-income families (4%) (D. J.

Figure 2

Teacher-Child Interactions in Centers Serving Primarily Low Income, Middle-Income, and Upper-Income Children



Note. Teacher sensitivity was significantly lower ($p < .0001$) and detachment was significantly higher ($p < .0001$) in low-income than in either middle- or upper-income centers. There was significantly greater harshness ($p < .0005$) in low- and middle-income centers than in upper-income centers. From "Childcare for Children in Poverty: Opportunity or Inequity?" by D. Phillips, M. Varan, E. Kisker, C. Howes, and M. Whitbook, 1994, *Child Development*, 65, p. 487 (Figure 3). Copyright 1994 by the Society for Research in Child Development. Reprinted with permission.

Brody et al., 1994). Statewide screening in Massachusetts of children nine months to four years of age uncovered similarly strong links between childhood poverty and lead exposure. This study also documented that lead exposure was largely coming from residence in older homes where lead-based paint was prevalent (Sargent, Brown, Freedman, & Bailey, 1995). Similar data have been uncovered in other studies (Mielke et al., 1997; Nordin et al., 1998). Pesticide exposure has also been strongly tied to income in the United States (Moses et al., 1993). Ambient air pollution (e.g., sulfur oxides, particulates) in St. Louis has been linearly related to household income (Freeman, 1972). In Britain the distribution of major industrial pollution is strongly skewed by income. For example, the lowest income postal zones (equivalent households per zone having less than £10,000) have 54% more pollution sources than expected if pollution were randomly distributed across postal zones. This contrasts markedly with affluent postal zones (having more than £30,000), which have 81% fewer pollution sources than expected (Friends of the Earth, United Kingdom, 1999). As shown in Figure 3, families living in the lowest income deciles are exposed to 80% of the total carcinogenic emissions from factories in England (Friends of the Earth, United Kingdom, 2001).

The picture for indoor air quality is comparable. National statistics show that 65% of low-income American preschool children are exposed to parental smoking at home relative to 47% of those not in poverty (National

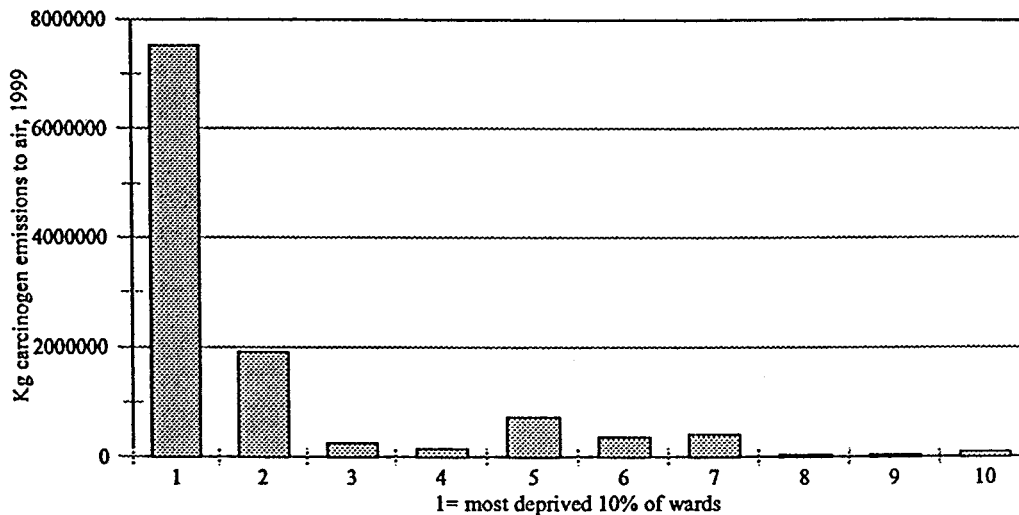
Center for Health Statistics, 1991). Low-income homes have higher levels of nitrogen dioxide, carbon monoxide, and radon (Chi & Laquatra, 1990; Goldstein, Andrews, & Hartel, 1988, Laquatra, Maxwell, & Pierce, in press) and allergen exposures associated with asthma (Sarpong, Hamilton, Eggleston, & Adkinson, 1996). Access to safe drinking water in both the Third World (Bartlett, 1999; Clauson-Kaas et al., 1997) and America is inversely related to income (Calderon et al., 1993). In addition to the direct impacts that inadequate water supplies and poor sanitation have on physical health, there are additional costs. A disproportionate expenditure of time and effort often accompanies access to drinking water, latrines, and waste facilities among the poor in Third World countries (Bartlett et al., 1999).

As shown in Table 3, poorer children from a large, representative sample of London schools were more likely to be exposed to noise where they attend school (Haines, Stansfeld, Head, & Job, 2002). Leq is a 24-hour average in decibels. Decibels is a logarithmic scale, with a 10-decibel increase experienced as twice as loud. In a national survey of major American metropolitan areas, the correlation between household income and Leq was $-.61$ (U.S. Environmental Protection Agency, 1977).

In addition to examining ambient environmental quality such as toxins, air, water, and noise pollution, it is important also to investigate the more immediate living conditions of poor children. U.S. Census data reveal that

Figure 3
Factory Pollution and Deprivation in Britain

Factory Pollution and Deprivation (carcinogen emissions in local wards)



Note. Wards are subdivisions of local authorities in England, averaging approximately 8,000 persons per ward. Deprivation (corrected for ward population size) is a weighted estimate based on income (25%), employment (25%), health status and benefits (15%), educational levels (15%), housing quality (10%), and access to basic services (10%). The 8,414 wards were broken into 10 parts (on the graph, 1 = the most deprived 10% of wards [Wards 1–842]; 2 is the next most deprived 10% [Wards 842–1682], etc.). The pollution data covered all factories in England emitting more than 1,000 kilograms of carcinogens into the air in 1999. There are 156 of these factories. See http://www.odpm.gov.uk/stellent/groups/odpm_urbanpolicy/documents/page/odpm_urbpol_608088.hcsp for further details on the deprivation index. From *Pollution and Poverty: Breaking the Link* (Graph 2), by Friends of the Earth (England, Wales, & Northern Ireland), 2001. Copyright 2001 by Friends of the Earth (England, Wales, & Northern Ireland). Reprinted with permission.

the percentage of people living in homes with more than one person per room is linearly related to household income levels (Myers, Baer, & Choi, 1996) and that poor families with one or more children under 18 years of age are more than three times likely (29.4%) to live in crowded homes (more than one person/room) than families who are not poor (8.7%) (Children’s Defense Fund, 1995). Low-income 1-year-olds in a national sample of low birth weight, premature babies were more than twice as likely to

live in crowded housing compared with infants in families that were not poor (Liaw & Brooks-Gunn, 1994). A nationwide British study showed that 78% of unskilled laborer families with children under 18 years of age lived in homes with more than one person per room, compared with 14% of professional families (Davie, Butler, & Goldstein, 1972). The availability of open space and nature to families is tied to income levels as well. In New York City, low-income neighborhoods average 17 square yards of park space per child, compared with 40 square yards for the rest of the city (Sherman, 1994). Manual laborers in Britain are four times more likely (14%) to have a garden or yard too small to sit outside in compared with managers or professionals (3%) (Townsend, 1979).

Other aspects of housing quality are linked with income, as shown in census data from the American Housing Survey (Mayer, 1997) (see Table 4). Additional data from this nationally representative survey of housing stock show that children living at or below the poverty line are 3.4 times more likely to live in houses with structural defects (22.3%), 3.6 times more likely to live in houses infested with rodents (14.4%), and 2.7 time more likely to have inadequate heat in the winter (17.9%), compared with children living above the poverty line (Children’s Defense Fund, 1995). Furthermore, several nationwide public health

Table 3
Aircraft Noise Exposure and Elementary School Poverty Levels in London

	Low noise (< 57 Leq)	Moderate noise (57–63 Leq)	High noise (64–72 Leq)
% eligible free lunch	14	23	28

Note. Leq is a daily average of sound intensity measured in decibels. A change in 10 decibels is perceived as twice as loud. From Table 2 in “Multilevel Modelling of Aircraft Noise on Performance Tests in Schools Around Heathrow Airport London,” by M. M. Haines, S. A. Stansfeld, J. Head, and R. F. S. Job, 2002, *International Journal of Epidemiology and Community Health*, 56, p. 141. Copyright 2002 by the BMJ Publishing Group. Reprinted with permission.

Table 4*Percent of American Children Living in Homes With Selected Problems, by Parents' Income, 1985–1989*

	Income decile		Income quintile	
	First	Second	Third	Fourth
Median income level (1992 dollars)	\$4,619	\$13,467	\$37,902	\$93,912
Incomplete bathroom ^a	2.5	2.2	.7	.6
No sewer/septic system	1.7	.9	.1	0
No central heat	32.3	34.7	21.4	9.6
Holes in floor	7.0	5.8	1.4	.6
Open cracks in wall or ceiling	19.9	15.9	6.3	3.2
Leaky roof	11.9	12.5	8.5	7.3

Note. Adapted from Table 4.6 ("Percent of Children Living in Homes With Selected Problems, by Parents' Income, 1973–89") in "Trends in the Economic Well Being and Life Chances of America's Children," by S. E. Mayer, in Greg J. Duncan and Jeanne Brooks-Gunn (Eds.), *Consequences of Growing Up Poor* (pp. 62–63). Copyright 1997 by the Russell Sage Foundation, 112 East 64th Street, New York, NY 10021. Reprinted with permission. Tabulated by Tim Veenstra.

^a Complete plumbing located in a single room within the unit.

screenings have revealed that poverty in America is strongly tied to childhood injuries related to risks in the home. Low-income families live in homes with fewer smoke detectors and fire extinguishers, more ungated stairs, more unlocked storage closets, and are more likely to have scalding tap water (Gielen, Wilson, Faden, Wissow, & Harvilchuck, 1995; Sanger & Stocking 1991; Sharp & Carter, 1992). The provision of designated play spaces for young children in the home is also inversely related to social class (Newson & Newson, 1976). National data also show that American low-income families are less likely to have amenities such as washing machines, clothes dryers, or air-conditioning (Federman et al., 1996). Even greater income-related housing inequities have been uncovered in the Third World (Satterthwaite et al., 1996; Stephens et al., 1997). Moreover, low-income housing in many of these economically deprived countries is more likely to be situated in hazardous locations where flooding and other disasters occur (Bartlett, 1999).

In addition to substandard housing quality, low-income families face a housing affordability crisis in America. The federal standard for affordable housing in America is less than 30% of income. More than 75% of American households below the poverty line exceed this standard, and nearly half of them pay more than 70% of their income for housing (Timmer, Eitzen, & Talley, 1994).

One of the reasons low-income children engage in fewer literary activities may be the home environment. Several large national studies covering children from birth through elementary school found that the longer the child lived below the poverty line, the more impoverished the home learning resources (e.g., age-appropriate toys, books) and the fewer the supportive parental behaviors (e.g., encouragement to learn the alphabet), as assessed by independent ratings of the home (Duncan, Brooks-Gunn, & Klebanov, 1994; Smith, Brooks-Gunn, & Klebanov, 1997). Fifty-nine percent of American children between three and five years of age have 10 or more children's books at home.

Eighty-one percent of the nonpoor have 10 or more children's books in their home (Sherman, 1994). In their study of social class and human development in the United Kingdom, Newson and Newson (1977) demonstrated that 40% of the homes of unskilled laborers contained fewer than 3 books; in comparison, none of the homes of professionals lacked books. Moreover, as noted earlier, low-income children watch much more television than their wealthier counterparts (Larson & Verma, 1999; U.S. Department of Health and Human Services, 2000).

Low-income children in America are much less likely to have access to a home computer or the Internet. U.S. Census data reveal more than a fourfold increase in home computer access in households with incomes greater than \$75,000 in comparison to households with incomes below \$20,000 (Becker, 2000). Ninety-four percent of inner-city children in the United States have no Internet access compared with 57% of more affluent, urban children (Annie Casey Foundation, 2000). In addition to having less access to computers, low-income children who have computers have poorer quality hardware (e.g., CD ROM, mouse, on-line-access) and tend to use them in less sophisticated ways (e.g., games vs. word processing) than more affluent children (Becker, 2000). Low-income schools also lag far behind schools serving more affluent populations in terms of the availability and quality of computer technology (Becker, 2000).

Not only are the immediate home settings of poor children fraught with physical inequities, but the neighborhoods they live in are frequently characterized by multiple risks. Low-income neighborhoods have significantly more crime (Federman et al., 1996; Sampson et al., 1997). A meta-analysis of poverty and crime showed a mean correlation of .44 between the percentage of households below the poverty line and violent crime rates in American standard metropolitan statistical areas (Hsieh & Pugh, 1993). The basic infrastructure of low-income neighborhoods is often lacking, with substandard housing stock, more aban-

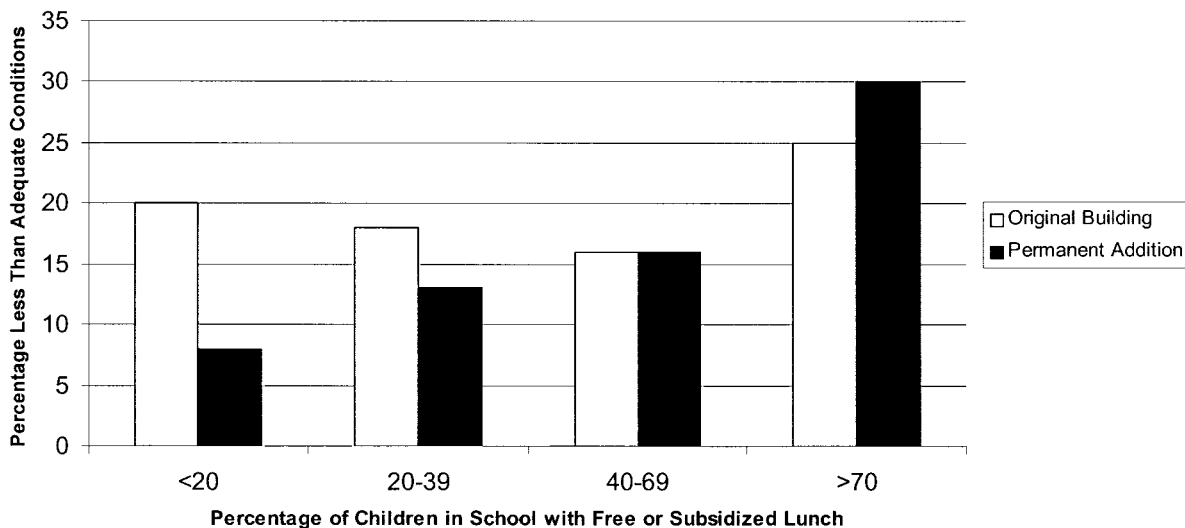
done lots and boarded-up buildings, inadequate municipal services (e.g., garbage collection, police and fire protection), and fewer retail facilities (Joint Center for Housing Studies at Harvard University, 1999; Wallace & Wallace, 1998; Wandersman & Nation, 1998). Low-income neighborhoods often lack amenities such as retail and service merchants (Macintyre, Maciver, & Sooman, 1993). Although the well-documented link between household income levels and insufficient nutrition in children (Alaimo, Olson, & Frongillo, 2001; Miller & Korenman, 1994) is a complex subject, one likely contributor to this relationship is inaccessibility to healthy food. Using the median income of homes per census tract as an index of wealth in a study across multiple metropolitan areas, Moreland, Wing, Diez-Rioux, and Poole (2002) found that low-income neighborhoods had three times fewer supermarkets, comparable numbers of small grocers and convenience stores, and three times more bars and taverns as middle- and upper-income neighborhoods. Higher prices and less readily accessible healthy food for the poor have been uncovered in several other countries as well (Mackerras, 1997; Sooman, Macintyre, & Anderson, 1993). There are direct links between access to supermarkets and healthier dietary intake (Glanz, Basil, Maibach, Goldberg, & Snyder, 1998; Moreland, Wing, & Diez-Rioux, 2002).

The neighborhoods in which poor children live are also more physically hazardous. American elementary school aged children from low-income families are exposed to more street traffic (50% more street crossings per day relative to the nonpoor), which largely accounts for the sixfold greater risk of pedestrian accidents among poor

children (Macpherson, Roberts, & Pless, 1998). British children of unskilled laborers are five times more likely to suffer a pedestrian accident than the children of professionals (Roberts & Power, 1996). Poor children's play spaces are more hazardous as well. For example, Suecoff, Avner, Chou, and Drain (1999) found 50% more hazards in playgrounds located in low- relative to middle- and upper-income neighborhoods in New York City.

Per-pupil school expenditure in America is strongly tied to financial advantage. As an illustration, in 1991 the expenditure in the 47 largest urban school districts in the United States averaged \$875 less per pupil than in surrounding suburban districts (National Research Council, 1993). For a class of 25 children, this calculates to more than \$20,000 annually per classroom. Not surprisingly, the physical infrastructure of school facilities in poor communities suffers accordingly. As shown in Figure 4, the quality of school building facilities in a representative sample of American public schools is tied to the income profile of the student body (National Center for Education Statistics, 2000). Predominantly low-income schools are more likely to have leaky roofs, inadequate plumbing and heating, problems with lighting, inadequate ventilation, and acoustical deficiencies (National Center for Education Statistics, 2000). Children in predominantly low-income schools are also more likely to be overcrowded. Twelve percent of low-income schools are above 125% of building capacity; this compares with 6% of relatively affluent schools (National Center For Education Statistics, 2000).

Figure 4
Percentage of Poor Children and Schools With Inadequate Physical Quality



Note. The association between school income levels and structural inadequacy is marginal ($p < .10$) for original buildings and significant ($p < .05$) for permanent additions. Adapted from *Condition of America's Public School Facilities: 1999* (NCES 2000-032) (Table 4), by the National Center for Education Statistics, 2000, Washington, DC: U.S. Department of Education.

Environmental Risk and Developmental Outcomes

Many of the specific social and physical environmental characteristics associated with poverty are established risk factors for children's healthy development. Family turmoil and discord as well as nonresponsive and harsh parenting affect socioemotional and cognitive development (Emery & Laumann-Billings, 1998; Grant et al., 2003; Repetti, Taylor, & Seeman, 2002; Taylor, Repetti, & Seeman, 1997) as well as physical health (Chen et al., 2002; Repetti et al., 2002). Cognitive enrichment activities such as quantity and quality of parent-to-child speech (Hart & Risley, 1995; Hoff et al., 2002) and exposure to print media (Neuman & Roskos, 1993) enhance cognitive development. Unpredictable, chaotic households are inimical to healthy socioemotional development (Bronfenbrenner & Evans, 2000; Fiese & Kline, 1993; Repetti et al., 2002; Wachs, 2000), and instability both at home (Ackerman, Kogos, Youngstrom, Schoff, & Izard, 1999; Humke & Schaefer, 1995; Kohen et al., 1998) and at school (Lee & Croninger, 1994; Rutter et al., 1974) is associated with adverse socioemotional and cognitive outcomes. Exposure to violence is clearly harmful to children (Osofsky, 1995). Diminished social support, smaller social networks, and lower neighborhood social capital are all associated with adverse child outcomes (Leventhal & Brooks-Gunn, 2000; McNeeley et al., 2002; Repetti et al., 2002; Taylor et al., 1997; Wandersman & Nation, 1998). Less immersion in literacy activities and more time watching television adversely affect cognitive development and possibly behavioral conduct disorders as well (Coley, 2002; Larson & Verma, 1999).

Exposure to toxins such as lead and pesticides, along with residence in areas with poorer air and water quality, causes physical health problems and cognitive deficits in children (Holgate, Samet, Koren, & Maynard, 1999; National Research Council, 1991; Riley & Vorhees, 1991). Residential crowding and noise have both been associated with socioemotional distress and elevated psychophysiological stress among children (Evans, 2001). High noise levels (e.g., airport operations) reliably interfere with reading acquisition (Evans, 2001). Substandard housing quality causes respiratory morbidity and childhood injuries (Lawrence, 2002; Matte & Jacobs, 2000; Satterthwaite et al., 1996) and may elevate psychological distress in children (Evans, Wells, & Moch, 2003; Gifford, in press). Low-quality school facilities are associated with poor learning outcomes (Moore & Lackney, 1993; Schneider, 2002). Living close to streets with high traffic volume increases childhood injuries (MacPherson et al., 1998; Mueller, Rivara, Lii, & Weiss, 1990).

Although the surroundings of low-income children contain more singular psychosocial and physical environmental risk factors with known adverse developmental outcomes, the confluence of multiple psychosocial and physical risk factors may be a key, unique feature of childhood poverty. Adverse socioemotional and cognitive developmental outcomes are accelerated by exposure to multiple risks relative to singular risk exposure (Ackerman,

Izard, Schoff, Youngstrom, & Kogos, 1999; Barocas, Seifer, & Sameroff, 1985; Evans, 2003; Lengua, 2002; Liaw & Brooks-Gunn, 1994; Rutter, 1983; Sameroff, 1998; Werner & Smith, 1982). Parallel trends have been shown for the development of physical health problems from cumulative risk exposure (Evans, 2003, McEwen, 1998; 2000; McEwen & Seeman, 1999).

There are limited data suggesting that cumulative risk exposure may account for some of the developmental disarray accompanying poverty. Both the frequency and intensity of stressful life events and daily hassles are greater among low-income children (Attar, Guerra, & Tolan, 1994; Brown, Cowen, Hightower, & Lotyczewski, 1986; Dubow, Tisak, Causey, Hryshko, & Reid, 1991; Liaw & Brooks-Gunn, 1994; Rutter, 1981) and lower social class families (Felner et al., 1995). As an illustration, low-income fourth graders had 35% more life events and hassles in one year than their middle-income counterparts in the Chicago metropolitan region (Attar et al., 1994). Lower social class (parental occupation), inner-city children in London compared with working class children lived more often with a single parent, experienced greater marital discord, were more likely to have been in foster care for a week or more, experienced higher rates of paternal incarceration, lived in more crowded homes, lived more often in public housing, and attended schools with higher turnover rates (in terms of teachers as well as students; Rutter et al., 1974). In a national study of low birth weight, premature infants, low-income toddlers experienced two-and-a-half times more risk factors than toddlers from middle-income families (Liaw & Brooks-Gunn, 1994). Thirty-five percent of the low-income toddlers in the Liaw and Brooks-Gunn study had been exposed to six or more risk factors, as opposed to 5% of the middle-income toddlers. Low-income households face a significantly greater array of material hardships (housing, food, medical costs) than middle- and upper-income households (Mayer & Jencks, 1989). Family adjustments to multiple material deprivation can indirectly exacerbate environmental risks as well. For example, elevated utility bills in the winter months in the Northeast are inversely related to nutritional intake in low-income infants and toddlers (Frank et al., 1996).

Although these various studies uncovered associations between poverty, cumulative risk exposure, and developmental problems, none examined whether multiple risk exposure could account for the adverse consequences of poverty on children. We recently tested this hypothesis directly among a sample of rural low- and middle-income children in grades three through five (Evans & English, 2002). Multimethodological assessments of developmental outcomes included a behavioral index of emotion regulation (delay of gratification), standardized maternal and self-report measures of psychological distress, and neuroendocrinological and cardiovascular indexes of chronic physiological stress. With the exception of norepinephrine, all measures indicated greater adversity among the low-income children (Evans & English, 2002).

Compared with their middle-income counterparts, low-income children experienced greater multiple risks

(see Figure 5). Family turmoil, child separation, and exposure to violence were assessed by maternal reports on a standardized index of life events for children (Work, Cowen, Parker, & Wyman, 1990; Wyman, Cowen, Work, & Parker, 1991). Crowding was indexed in terms of people per room, and noise exposure in the home was indexed in multiple measures of decibel levels. Housing quality was measured with a reliable and valid rater-based instrument (Evans, Wells, Chan, & Saltzman, 2000). Each psychosocial and physical factor was defined as risk/no risk by dichotomizing exposure. Thus, the multiple stressor exposure metric varied from zero to six.

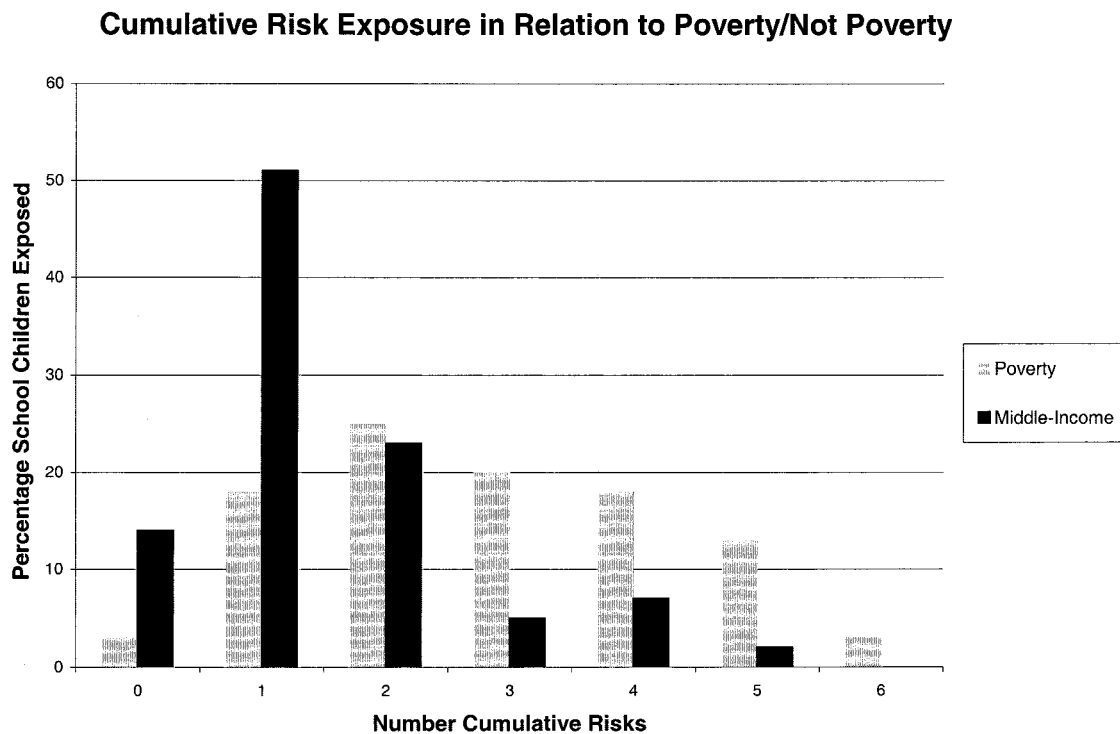
The confluence of psychosocial and physical environmental risks may play a particularly important role in precipitating the developmental disarray associated with poverty. In order to examine this hypothesis more closely, we then tested whether the significant adverse relations between poverty and children's development were mediated by multiple stressor exposure (Evans & English, 2002). For chronic physiological stress, the data consistently showed that a primary pathway through which poverty influences physiological stress in children is exposure to multiple stressors. Low-income children experienced

significantly more multiple stressors (zero to six), and this in turn elevated chronic physiological stress vis-à-vis middle-income children. For maternal and self-ratings of psychological distress, partial mediation occurred. Emotion regulation was fully mediated by multiple stressor exposure (Evans & English, 2002). Consistent with our findings, positive relations between parental educational attainment and middle school adolescents' psychological adjustment and grades, respectively, were mediated by stressor exposure, family social climate, and sense of belonging at school (Felner et al., 1995). Multiple measures of developmental disarray associated with poverty are conveyed, at least in part, by cumulative exposure to multiple psychosocial and physical stressors in the immediate environment. Because our study is the only one to directly test this mediational pathway and involves cross-sectional data, caution is warranted in drawing causal conclusions.

Any attempt to attribute the negative developmental consequences of poverty to the high-risk environments that these children inhabit must also grapple with the potential role of genetics. Family income effects on cognitive and socioemotional development after partialing out essential

Figure 5

Percentage of Poor and Nonpoor Children Exposed to Cumulative Physical and Psychosocial Environmental Risks



Note. The mean number of multiple stressors is significantly higher ($p < .001$) for the poverty sample compared with the middle-income sample. Data adapted from a corrected version of Table 2 in *Child Development*, 74(5), p. 1338, which originally appeared in "The Environment of Poverty: Multiple Stressor Exposure, Psychophysiological Stress, and Socioemotional Adjustment," by G. W. Evans and K. English, 2002, *Child Development*, 73, p. 1242. Copyright 2002/2003 by the Society for Research in Child Development. Adapted with permission.

child (e.g., birth weight) and parental (e.g., maternal verbal ability) characteristics (Linver, Brooks-Gunn, & Kohen, 2002), twin studies incorporating direct measures of environment and genetic variance (Caspi, Taylor, Moffitt, & Plomin, 2000), sibling variability in income within families over time (Duncan, Yeung, Brooks-Gunn, & Smith, 1998), intrafamily income variability over time (Dearing, McCartney, & Taylor, 2001), adoption studies placing at-risk children into families of varying SES (parental occupation; Duyme, Dumaret, & Tomkiewicz, 1999), housing improvement programs that relocate public housing families to neighborhoods varying in income levels (Johnson, Ladd, & Ludwig, 2002; Katz, Kling, & Liebman, 2001; Leventhal & Brooks-Gunn, 2003; Rosenbaum & Harris, 2001), and income intervention experiments that randomly alter household income for indigent families (Gennetian & Miller, 2002; Salkind & Haskins, 1982) all converge on poverty adversely impacting children independent of genetic inheritance. I am not arguing that genes play no role in the relation between poverty and children's development, but I am asserting that they alone cannot account for the effects of poverty on children's well-being.

Conclusions

Poverty is harmful to the physical, socioemotional, and cognitive well-being of children, youths, and their families. A potent explanation for this relation is cumulative, environmental risk exposure. Compared with middle- and high-income children, low-income children are disproportionately exposed to more adverse social and physical environmental conditions. They suffer greater family turmoil, violence, and separation from their parents. Their parents are more nonresponsive and harsh, and they live in more chaotic households, with fewer routines, less structure, and greater instability. Poor children have fewer and less socially supportive networks than their more affluent counterparts, live in neighborhoods that are lower in social capital, and as adolescents are more likely to rely on peers than adults. Low-income children have fewer cognitive enrichment opportunities both at home and in their neighborhoods. They read less, have fewer books at home, are infrequent library patrons, and spend considerably more time watching TV than their middle-income counterparts.

Poor children reside in more polluted, unhealthy environments. They breathe air and drink water that are more polluted. Their households are more crowded, noisier, and more physically deteriorated, and they contain more safety hazards. Low-income neighborhoods are more dangerous, have poorer services, and are more physically deteriorated. The neighborhoods where poor children live are more hazardous (e.g., greater traffic volume, more crime, less playground safety) and less likely to contain elements of nature. Poor children are more likely to attend schools and day-care facilities that are inadequate. Although low-income children face a bewildering array of psychosocial and physical risk factors, there is emerging evidence of accelerating levels of chaos among American children across the

socioeconomic spectrum (Bronfenbrenner, McClelland, Wethington, Moen, & Ceci, 1996).

Although each of these singular psychosocial and physical risk factors has adverse developmental consequences, exposure to cumulative risks accompanying poverty may be a key, unique aspect of the environment of poverty. The confluence of multiple demands from the psychosocial and physical environment appears to be a powerful force leading to physical and psychological morbidity among low-income children. Duration of exposure to poverty is also important to consider from an ecological perspective. Persistent, early childhood poverty has more adverse impacts relative to intermittent poverty exposure (Bolger, Patterson, Thompson, & Kupersmidt, 1995; Duncan & Brooks-Gunn, 1997; Duncan et al., 1994). Chronic poverty leads to a greater accumulation of social and environmental risk exposure. Psychologists need to come to grips with the ecological reality of poverty and desist relegating income and SES to unexplained, confounding variables in their models of human behavior and well-being.

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Correction to “Accredited Doctoral Programs” List (2003)

The list of “Accredited Doctoral Programs in Professional Psychology: 2003” (*American Psychologist*, 2003, Vol. 58, No. 12, pp. 1067–1080) contained an error. On page 1074, the University of Southern California is incorrectly identified (Footnote 7) as no longer admitting students to its doctoral program in clinical psychology. This is not the case. However, the University of Southern California is no longer admitting students to its doctoral program in *counseling* psychology (listed on page 1078), and the program is being phased out.
