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Clinical Psychological Science 2014 2: 287 originally published online 1 October 2013

DOI: 10.1177/2167702613501496

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Clinical Psychological Science
2014, Vol. 2(3) 287–296
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DOI: 10.1177/2167702613501496
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Abstract

One out of four American children is born into poverty, but little is known about the long-term mental health implications of early deprivation. The more time in poverty from birth to age 9, the worse mental health is for these individuals as emerging adults ($n = 196$, $M = 17.30$ years, 53% male). These results maintained independently of concurrent, adult income levels for self-reported externalizing symptoms and a standard learned helplessness behavioral protocol, but internalizing symptoms were unaffected by childhood poverty. We then demonstrate that part of the reason why early poverty exposure is harmful to mental health among emerging adults is because of elevated cumulative risk exposure assessed at age 13. The significant prospective longitudinal relations between early childhood poverty and externalizing symptoms plus learned helplessness behavior are mediated, in part, by exposure to a confluence of psychosocial (violence, family turmoil, child separation from family) and physical (noise, crowding, substandard housing) risk factors during adolescence.

Keywords

poverty, risk factors, psychological stress

Received 6/6/13; Revision accepted 6/27/13

A decade of stagnant wages coupled with an enduring economic recession do not bode well for future human capital (Blair & Raver, 2012; Duncan, 2012; Knudsen, Heckman, Cameron, & Shonkoff, 2006; Robert Wood Johnson Foundation, 2009). Consider the magnitude of the problem: Approximately 25% of American children currently spend all or part of their early childhood growing up in poverty (U.S. Census Bureau, 2012), with worldwide early childhood poverty rates much worse (World Health Organization [WHO], 2008). The economic and human costs of early childhood poverty are immense, ranging from dramatic achievement gaps and elevated psychological distress to greater morbidity for every major chronic physical disease, eventually resulting in premature mortality (Maholmes & King, 2012). For more than half a century, scientists and practitioners worldwide have documented social inequalities in physical and psychological health among adults (Adler & Rehkopf, 2008; Adler & Stewart, 2010; Braveman, Egerter, & Williams, 2011; Matthews & Gallo, 2010; WHO, 2008) as well as children (Aber, Bennett, Conley, & Li, 1997; Blair & Raver, 2012; Bradley & Corwyn,

2002; Chen, Matthews, & Boyce, 2002; Hertzman & Boyce, 2010; Luthar, 1999; McLoyd, 1998; Schreier & Chen, 2013; Shonkoff & Garner, 2012). Moreover, early deprivation portends elevated physical morbidity and mortality later in life, even among the upwardly mobile (S. Cohen, Janicki-Deverts, Chen, & Matthews, 2010; Shonkoff, Boyce, & McEwen, 2009).

Largely absent from research on childhood poverty and well-being is examination of the long-term implications of early deprivation and mental health among emerging adults. We have little information about whether the linkages between poverty exposure early in life shape subsequent psychological health and whether, similar to physical morbidity, this happens irrespective of adult financial circumstances. Moreover, assuming such prospective relations exist, we do not know why they

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happen. Herein we test two hypotheses: First, early childhood poverty will lead to elevated psychological impairment later in life, irrespective of adult financial circumstances. Second, this prospective longitudinal relation will be caused, in part, by exposure to higher levels of cumulative risk factors during the intervening years between early childhood poverty and emerging adulthood.

A large literature reveals both cross-sectional and longitudinal evidence of relations between childhood poverty and psychological distress (Bradley & Corwyn, 2002; Conger & Donnellan, 2007; Grant et al., 2003; Luthar, 1999; McLoyd, 1998; Wadsworth, Evans, Grant, Carter, & Duffy, in press). Overall trends suggest that the impacts on externalizing relative to internalizing symptoms are more pervasive and that early and sustained early experiences of poverty are especially consequential for children's psychological well-being (Wadsworth et al., in press). Much less is known about the long-term mental health implications of early childhood poverty, but a few studies suggest that early poverty is a risk factor for subsequent psychopathology, particularly externalizing disorders. For example, socioeconomic status (SES) at age 2 led to greater increases in antisocial behavior up to age 14, whereas depression was unaffected (Stroschein, 2005). A similar pattern of externalization data was uncovered among 5- to 12-year-olds in a different sample (Schonberg & Shaw, 2007). Low SES at 2 years did not predict singular, elevated internalization or externalization trajectories from age 2 to age 12, but early deprivation was associated with accelerating rates of co-occurring internalization and externalization symptomatology (Fanti & Henrich, 2010). In a rare natural experiment on income and child mental health, Native American children in families receiving casino-related income supplements in comparison to their peers without income supplements had lower levels of externalization, but their internalization symptoms were unaffected (Costello, Erkanli, Copeland, & Angold, 2010). Moreover, this happened both during childhood and subsequently at ages 19 and 21. In contrast to these studies, poverty early in life predicted elevated depression and anxiety at ages 14 and 21, and the greater the duration of early childhood poverty (i.e., prenatal, 6 months, 5 years), the higher the levels of adolescent and young adult internalization symptoms (Najman et al., 2010). Of additional interest to the present study, the prospective benefits of income supplements in childhood (Costello et al., 2010) or early experiences of nonpoverty (Najman et al., 2010) on adult psychopathology occurred independently of concurrent adult income levels. The incorporation of statistical controls for concurrent income in these two longitudinal studies is important from a developmental perspective

because the findings strongly suggest that deprivation earlier in life rather than concurrent income is what matters for adult psychopathology.

We build on this small foundation of prospective studies on early childhood poverty and adult mental health in two respects. In addition to self- or caregiver-ratings of psychological well-being, we incorporated a behavioral index of learned helplessness. Uncontrollable and chaotic qualities of low-income environments are capable of interfering with a sense of competency, the belief that one is an effective agent in acting on one's surroundings (Ackerman & Brown, 2010; Fiese, 2006; Peterson, Maier, & Seligman, 1993; White, 1959). Low-income children are more apt to grow up in chaotic residential settings that are in disrepair, noisy, crowded, and cluttered and that lack routines and structure (Evans, 2004; Vernon-Feagans, Garrett-Peters, De Marco, & Bratsch-Hines, 2012). Thus in addition to expecting a prospective longitudinal association between early experiences of poverty and elevated internalization and externalization symptoms during emerging adulthood, we hypothesized that experiences of early childhood poverty would also lead to greater susceptibility to learned helplessness later in life. The addition of a behavioral index of psychological well-being provides an important multimethodological supplement to the literature on childhood poverty and mental health.

The second contribution the present study makes to the nascent literature on early childhood poverty and adult mental health is the examination of an underlying mediational pathway to help explain why poverty might lead to subsequent adult psychological distress. We hypothesize that one reason why early childhood poverty can lead to ill mental health in adulthood is because of a surfeit of risk exposures. A vast literature demonstrates that when children are exposed to a confluence of risk factors, their mental health suffers (Evans, Li, & Whipple, in press; Obradovic, Shaffer, & Masten, 2012; Pressman, Klebanov, & Brooks-Gunn, 2012; Sameroff, 2006). In general this literature shows that the more risk factors encountered, the worse the child's mental health. This cumulative risk exposure—child mental health function—has been demonstrated in cross-sectional, longitudinal, and risk-reduction intervention studies (Evans et al., in press). Moreover, across a wide range of behavioral and physical health outcomes, the particular constellation of risk factors does not appear to be critical; instead what seems to matter is the quantity of risk factors encountered (Evans et al., in press; Kraemer, Lowe, & Kupfer, 2005; Sameroff, 2006).

High levels of cumulative risk exposure may be a key component of the experience of early childhood poverty. Children from low-income households, relative to their

more affluent peers, are exposed to a high number of cumulative risk factors, ranging from family turmoil to substandard housing (Burchinal, Roberts, Hooper, & Zeisel, 2000; Deater-Deckard, Dodge, Bates, & Pettit, 1998; Evans & English, 2002; Federman et al., 1996; Felner et al., 1995; Greenberg, Lengua, Coie, & Pinderhughes, 1999; Klebanov, Brooks-Gunn, McCarton, & McCormick, 1998; Liaw & Brooks-Gunn, 1994; Rutter, 1979). We test whether such elevated cumulative risk exposure during early adolescence (13 years) might explain part of the expected association between early childhood poverty (birth to age 9) and subsequent psychological distress in emerging adults (17 years).

Summarizing, this study builds on the rapidly proliferating literature on childhood poverty and psychological well-being. We examine whether early experiences of family poverty predict disturbances in mental health during emerging adulthood. We also evaluate whether these effects happen independently of adult financial circumstances across multimethodological indicators of adult psychological health. Finally, we test whether the expected prospective longitudinal relations between early childhood poverty and emerging adult mental health are accounted for, at least in part, by elevated cumulative risk exposures accompanying childhood poverty.

Method

Participants

The participants in this study were part of a longitudinal study of rural poverty, cumulative risk, and child development (Evans, 2003; Evans & Kim, 2012). The original sample ($M = 9.18$ years) was recruited in rural counties in upstate New York using records from public schools, the Cooperative Extension System of the U.S. Department of Agriculture, the Head Start program, subsidized housing, and other antipoverty programs. In this sample, 50% of the participants came from families that were at or below an income-to-needs ratio of 1, which is the U.S. federal poverty line. The income-to-needs ratio is an annually adjusted per capita index. The other half of the sample at recruitment came from families with income-to-needs ratios 2 to 4 times the poverty line, which represents the levels of most American families. Additional data were collected when participants reached mean ages of 13.36 years (Wave 2) and 17.47 years (Wave 3). The final sample analyzed in the present study consisted of 196 participants ($M = 17.30$ years; 53% male; 95% White) at Wave 3 who had complete information on poverty, psychological symptoms, and cumulative risk exposure.

Procedures

All data were collected in participants' homes by a pair of experimenters working independently with each participant and the participant's mother. Only one child per household was tested. Each family's income-to-needs ratio was assessed at each wave of data collection. For each 6-month period of the participant's life, we also collected information on household composition and adult household members (job title, weekly working hours, and levels of education). These two data sources were used to estimate the proportion of life from birth to age 9 that the participant had lived at or below the poverty line. We defined poverty in this manner because duration of poverty appears to be particularly critical in childhood development.

Cumulative risk exposure. Cumulative risk exposure was calculated at Wave 2 (age 13) by exposures to three physical (noise, crowding, housing problems) and three psychosocial (family turmoil, separation from family, exposure to violence) risk factors. Noise was measured by a decibel meter over a 2-hour period in the home. Crowding was defined as the ratio of occupants to number of rooms in the home. Housing problems were assessed by trained raters on a standardized scale including structural problems, poor maintenance, cleanliness and clutter, physical hazards, and poor climatic conditions (Evans, Wells, Chan, & Saltzman, 2000). Exposure to social risks was determined by combining mothers' reports on the Life Event and Circumstances checklist (Work, Cowen, Parker, & Wyman, 1990) and youths' reports on the Adolescent Perceived Events Scale (Compas, Connor-Smith, Saltzman, Thomsen, & Wadsworth, 2001). An event was counted a single time if it was reported by the youth, the mother, or both. Multiple items (yes/no) constituted each social risk factor. For each of the six individual risk factors, risk was coded dichotomously. A score of 1 was given if the youth's exposure was in the upper quartile for the entire sample's distribution of continuous risk factor exposure at Wave 2, and a score of 0 was assigned for all lower levels of exposure. Cumulative risk (0–6) was then calculated by summing across the six singular risk factors.

Internalization and externalization symptoms. At Wave 3 the participants rated their internalization and externalization symptoms with the Youth Self Report Inventory (YSR; Achenbach, 1991) on a 3-point scale from 0 (*not true*) to 2 (*very true* or *often true*) on a series of questions about anxiety and depression (e.g., "I feel lonely," "I worry a lot"; $\alpha = .90$) and behavioral conduct problems (e.g., "I get into many fights"; $\alpha = .87$). At Wave

1, because of the child's age, the mother rated the child's symptoms with the Child Behavior Questionnaire (Rutter, Tizard, & Whitmore, 1970). On a 3-point scale (0 = *does not apply*, 2 = *certainly applies*) mothers rated behavioral indications of anxiety and depression (e.g., "often worries, worried about many things") as well as behavioral conduct problems (e.g., "bullies other children"). These scales are among the most widely used instruments to assess psychological well-being in nonclinical populations. They have undergone extensive psychometric development across a wide range of samples (Achenbach, 1991; Boyle & Jones, 1985).

Learned helplessness. Learned helplessness was assessed with a standard behavioral protocol adapted for children (S. Cohen, 1980; S. Cohen, Evans, Stokols, & Krantz, 1986; Glass & Singer, 1972; Peterson et al., 1993). At Wave 3, the participant was given a set of line drawings of geometric figures and instructed to trace over the figure lines without doubling back or lifting their pencil. The participant was given an initial practice puzzle to ensure comprehension of the task and the rules. A pile of identical puzzles was then placed in front of the young adult, and he or she was instructed to use as many pieces of paper as needed to solve the puzzle. The participant was instructed to work on the puzzle until solved or until he or she felt unable to solve it. At that point, the participant could move on to another puzzle. Once the young adult moved on to the second puzzle, he or she could not return to the first puzzle. Unbeknownst to the participant, the first puzzle was unsolvable. The second puzzle was solvable, and all participants solved the second puzzle. The order of the two puzzles was always the same to ensure that all participants experienced success prior to completion of the protocol. A total of 15 minutes was available for the two test puzzles. This task was at the end of the experimental protocol at each wave of data collection. The number of seconds the participant persisted on the first puzzle was the index of learned helplessness. This learned helplessness measure is related to beliefs about personal control, experimental manipulations of control, and chronic

exposure to uncontrollable stressors (S. Cohen, 1980; S. Cohen et al., 1986; Evans & Stecker, 2004; Glass & Singer, 1972; Peterson et al., 1993). Learned helplessness was assessed at Wave 1 by giving 9-year-old children 10 minutes to draw linkages between familiar pictures without doubling back or lifting their pencil. Time spent working on the first puzzle, which could not be solved, was the measure of learned helplessness. Children were also given a second, solvable puzzle to work on. Because the amount of time allocated to the learned helplessness protocols was different for Waves 1 and 3, the proportion of total time available was calculated for each wave.

Results

We first evaluated whether childhood poverty predicted mental health outcomes in emerging adulthood irrespective of current financial situation and controlling for baseline mental health levels. Because of skew (.773), the learned helplessness variables were log transformed.

The proportion of time spent in poverty from birth to age 9 significantly predicted externalizing symptoms ($B = 2.75$, $SE = 1.05$, $p < .01$) and learned helplessness ($B = -0.17$, $SE = 0.05$, $p < .01$) in emerging adulthood while controlling prior externalizing (age 9) and learned helplessness (age 9) levels, respectively. Proportion of time spent in poverty during childhood did not, however, predict internalizing symptoms in emerging adulthood, ($B = 0.34$, $SE = 1.26$, ns). Inclusion of the participant's current financial condition did not change the models. As shown in Tables 1 and 2, the effect sizes (f^2) for the two statistically significant poverty effects are modest (.12, .11; J. Cohen, 1988).

In both cases, the beta decreases when the mediator, cumulative risks, is controlled for, demonstrating the intervening effect of cumulative risk. In the case of externalizing symptoms, full mediation is indicated given the partial B weight for poverty is nonsignificant with the inclusion of the mediator in the equation (see third row, Table 1). In the case of learned helplessness, partial mediation is indicated because the B weight for poverty,

Table 1. Prospective Longitudinal Mediation Analysis of Externalizing Symptoms in Emerging Adulthood (Age 17) and Proportion of Time in Poverty (Birth to Age 9), Statistically Controlling for Externalizing Symptoms (Age 9)

Predictor	Total R^2	ΔR^2	$F\Delta R^2$	df	$B (SE)$	Effect size f^2
Proportion of life in poverty	.11	.03	6.93*	1, 194	2.75* (1.05)	.12
Cumulative risk	.12	.04	9.81*	1, 194	1.16* (0.37)	.14
Proportion of time in poverty controlling for cumulative risk	.13	.01	1.76	1, 193	1.56 (1.18)	.15

* $p < .01$.

Table 2. Prospective Longitudinal Mediation Analysis of Learned Helplessness in Emerging Adulthood (Age 17) and Proportion of Time in Poverty (Birth to Age 9), Statistically Controlling for Learned Helplessness (Age 9)

Predictor	Total R^2	ΔR^2	$F\Delta R^2$	df	$B (SE)$	Effect size f^2
Proportion of time in poverty	.10	.06	13.28**	1, 187	-0.17** (0.05)	.11
Cumulative risk	.10	.07	13.44**	1, 187	-0.06** (0.02)	.11
Proportion of life in poverty controlling for cumulative risk	.12	.02	4.26*	1, 186	-0.11* (0.05)	.13

* $p < .05$. ** $p < .01$.

although smaller, remains significant when the mediator is included in the equation (third row, Table 2).

Figures 1 and 2 depict the direct and indirect models utilizing regression with robust standard error terms and a bootstrapping test for the indirect effect (Preacher & Hayes, 2008). As shown in Figure 1, cumulative risk exposure at age 13 mediated the effects of early childhood poverty on externalizing symptoms in 17-year-olds. The 95% confidence interval for the indirect effect of cumulative risk exposure (0.58 to 3.36) indicates that the covariance between duration of poverty was significantly attenuated.

As shown in Figure 2, cumulative risk exposure during adolescence (age 13) also accounted for some of the covariation between early childhood poverty and helplessness in emerging adulthood (95% CI = -0.16 to -0.01).

Discussion

Emerging adults who grew up in poverty from birth to age 9 evidence greater externalizing symptoms and are more susceptible to learned helplessness in comparison to their more affluent counterparts (see Tables 1 and 2). These findings incorporate statistical controls for prior measures at age 9 of externalizing and learned helplessness, respectively. Changes in internalizing symptoms from age 9 to emerging adulthood, however, are unaffected by childhood poverty. Furthermore, the prospective longitudinal mental health sequelae of early poverty appear to be mediated, at least in part, by elevated cumulative risk exposure during adolescence (see Figures 1 and 2).

Across a wide spectrum of physical and psychological indicators of well-being, low-income persons fare worse (Adler & Rehkopf, 2008; Adler & Stewart, 2010; Blair & Raver, 2012; Braveman et al., 2011; Matthews & Gallo, 2010; WHO, 2008). These trends begin early in life (Aber et al., 1997; Chen et al., 2002; Hertzman & Boyce, 2010; Luthar, 1999; McLoyd, 1998; Schreier & Chen, 2013; Shonkoff & Garner, 2012). Furthermore, for physical health outcomes these effects persist throughout midlife, regardless of adult standard of living (S. Cohen et al., 2010; Shonkoff et al., 2009). We show that early childhood poverty sets children on a developmental trajectory of poorer behavioral adjustment in emerging adulthood. Furthermore, we have identified cumulative risk exposure as one factor that may help explain this outcome. Our study adds to the emerging database indicating that, similar to physical health, early childhood poverty is harmful for adults' psychological well-being, independent of adult SES (Costello et al., 2010; Najman et al., 2010). The longer a 9-year-old child has lived in poverty, the worse his or her mental health at age 17, irrespective of adult income levels. This holds true in prospective longitudinal analyses of externalization symptoms and a behavioral index of learned helplessness.

The null effects of childhood poverty on internalization symptoms match the overall mixed pattern found in prior cross sectional studies (Wadsworth et al., in press) and in three longitudinal investigations (Costello et al., 2010; Fanti & Henrich, 2010; Stroschein, 2005). The main effects of childhood poverty on externalization symptomatology replicate the large and consistent cross-sectional database (Aber et al., 1997; Bradley & Corwyn, 2002;

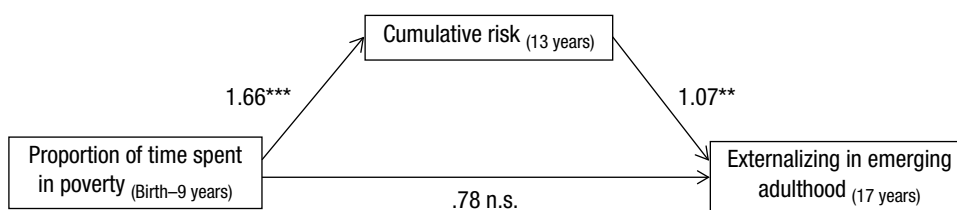


Fig. 1. Unstandardized regression coefficients for the relations between proportion of time spent in poverty and externalizing symptoms in emerging adulthood and the mediator cumulative risk. Note these analyses are prospective and longitudinal and include an index of prior externalizing symptoms.

* $p < .05$. ** $p < .01$. *** $p < .001$.

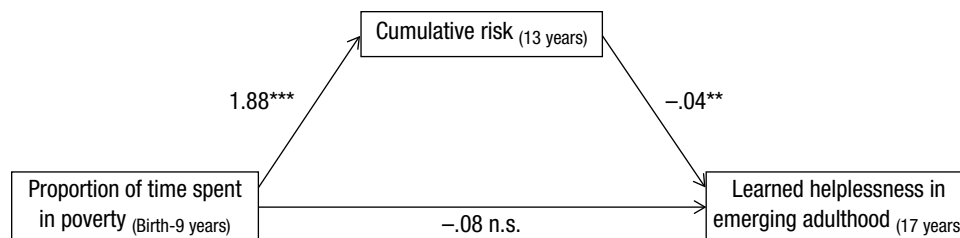


Fig. 2. Unstandardized regression coefficients for the relationship between proportion of time spent in poverty and learned helplessness in emerging adulthood as mediated by cumulative risk.
* $p < .05$. ** $p < .01$. *** $p < .001$.

Luthar, 1999; McLoyd, 1998; Wadsworth et al., in press) and match the small body of longitudinal work (Costello et al., 2010; Fanti & Henrich, 2010; Schonberg & Shaw, 2007; Stroschein, 2005).

Our prospective longitudinal childhood poverty and learned helplessness findings are consistent with earlier survey work showing that lower SES children in comparison to their more affluent peers have diminished self-efficacy (Bandura, Barbaranelli, Caprara, & Pastorelli, 2001) and lower internal locus of control (Battle & Rotter, 1963). Prior work has also shown that income (Evans, Gonnella, Marcynyszyn, Gentile, & Salpekar, 2005) as well as poverty-related risk factor exposure (Brown, 2009) are associated with learned helplessness in elementary-school-aged children and preschoolers, respectively.

Greater helplessness in children may be a critical but understudied reason for ubiquitous income-achievement gaps (Duncan, 2012; Duncan & Brooks-Gunn, 1997; Heckman, 2006) that have largely been addressed in terms of parental investments in cognitive stimulation (e.g., books, music, arts) as well as parent-to-child speech (Bradley & Corwyn, 2002; Duncan, 2012; Hoff, 2006). Low-income children may also be more likely to struggle academically because of motivational deficits related to helplessness, which is a robust predictor of academic performance (Peterson et al., 1993). One potential reason for the link between early childhood poverty and a decline in motivation could be the nature of the environment of childhood poverty. Low-income children are more likely to grow up in chaotic surroundings that include relatively high levels of noise, crowding, and substandard housing, coupled with fewer routines and less structure in their everyday lives (Ackerman & Brown, 2010; Evans, 2004; Vernon-Feagans et al., 2012). Helplessness is caused by repeated experiences of uncontrollable and unpredictable stimuli (S. Cohen, 1980; S. Cohen et al., 1986; Evans & Stecker, 2004; Peterson et al., 1993). Future research on childhood poverty and development over the life course ought to examine the role of uncontrollable and unpredictable experiences in

the lives of low SES children. The degree of structure and regularity in early life stressor exposure may matter just as much as the elevated intensities of multiple risk exposures accompanying childhood poverty (Ackerman & Brown, 2010; Fiese, 2006; Vernon-Feagans et al., 2012).

The longer 9-year-old children lived in poverty, the greater their exposure to cumulative risks during adolescence. This finding fits well with a large environmental justice literature documenting the disproportionate share of substandard physical and social environments low-income families live in (Evans, 2004; Sherman, 1994). This elevated cumulative risk exposure, in turn, appears to mediate the prospective relations between early childhood poverty and both externalization symptomatology and learned helplessness behaviors at age 17. These data are consistent with prior cross-sectional evidence of elevated cumulative risk factor exposure among lower relative to higher SES children and youth (Burchinal et al., 2000; Deater-Deckard et al., 1998; Evans, 2004; Evans & English, 2002; Federman et al., 1996; Felner et al., 1995; Greenberg et al., 1999; Klebanov et al., 1998; Liaw & Brooks-Gunn, 1994; Rutter, 1979). The mediating role of cumulative risk exposure in poverty and behavioral adjustment is also consistent with the literature documenting widespread adverse mental health sequelae from cumulative risk exposure during childhood (Evans et al., in press; Obradovic et al., 2012; Pressman et al., 2012; Sameroff, 2006). Herein, we formally introduce elevated cumulative risk exposure as a viable explanatory mechanism linking early childhood poverty to compromised behavioral adjustment during emerging adulthood.

An important limitation of this study is its observational design. Although the data emanate from prospective longitudinal analyses, it is possible that one or more "third" variables could be driving the childhood poverty effects on mental health during emerging adulthood. Inclusion of additional variables as statistical covariates, including maternal education, maternal mental health, maternal stress, and single parent status, had no effects

on the statistically significant poverty effects reported herein. Furthermore, these effects ensue independent of concurrent adult levels of income. Furthermore, reversing the order of terms in the mediational model (i.e., Poverty → Mental Health Outcome → Cumulative Risk) showed that neither YSR scores nor helplessness behavior mediated the link between poverty and cumulative risk. If one or more other variables were driving this mediational pathway, reversing the order of terms in the hierarchical regression equation would have yielded the same pattern of data. Recall as well that Costello et al. (2010) demonstrated positive gains in adult behavioral conduct scores in relation to a natural experiment on childhood income supplementation. Other early childhood income supplement experiments focused primarily on cognitive (Duncan, 2012) and physical health (Fernald, Gertler, & Hidrobo, 2012) outcomes have shown comparable gains.

Although the present findings extend what we currently know about early poverty and mental health, several essential questions remain. A critical task for psychologists and others interested in the behavioral impacts of poverty is to better understand the daily lives of children and families contending with financial deprivation. The present study suggests that one key and perhaps unique feature of the environment of childhood poverty is exposure to cumulative risk factors. However, this process is likely a dynamic one with certain experiences precipitating other events and circumstances that further pressure the adaptive capacities of children and their families as they contend with poverty. More thinking and analysis are needed to better capture this complex, dynamic process of accumulating risk factor exposures. It is also likely that risks across multiple domains of life (e.g., home and school) are more difficult to cope with than those experienced within only one domain (Evans et al., in press). We need to develop models of developmentally salient risk domains to better capture the ecological context of poverty and related risk exposures.

Developmental neuroscience presents new tools and insights that enable us to investigate how the quality and timing of early experiences can shape the brain's architecture and function. Given well documented covariation between childhood poverty and elevated chronic physiological stress (Blair & Raver, 2012; Evans, Chen, Miller, & Seeman, 2012; Evans & Kim, 2013), it should come as no surprise that brain structure and function appear to be affected by early experiences of poverty (Gianaros & Manuck, 2010; Hackman, Farah, & Meaney, 2010; McEwen & Gianaros, 2010). Some of this emerging work shows, for example, smaller hippocampal and larger amygdala structures as well as less connectivity between the prefrontal cortex and the amygdala among adults from lower SES backgrounds. There is also indication that the ability of prefrontal cortical structures to downwardly regulate

the amygdala is compromised in adults whose families were relatively deprived. The latter matches well with several recent studies showing associations between childhood poverty and disturbances in executive functioning (Evans & Kim, 2010; Lengua, 2012; Wadsworth et al., in press). A major task for researchers and clinicians concerned about the psychological sequelae of childhood poverty is to couple neuropsychological information with more in-depth assessment of the dynamic ecological context that envelopes disadvantaged children and their families.

One out of four American children now grows up in poverty, and worldwide the numbers are staggering. We already know the financial and human costs of this tragedy are immense. Psychology has much to contribute in thinking about how poverty can modify critical dimensions of the personal, familial, and community contexts that children need to thrive. We also have good theoretical models and emerging tools to investigate how developmental trajectories of fundamental cognitive and socioemotional processes can be altered by growing up in poverty and to illuminate the central role of the brain in the interface between the human ecology of childhood poverty and human development over the life course.

Author Contributions

G. W. Evans conceptualized the study and supervised data collection and analysis. R. C. Cassells completed data analysis. G. W. Evans and R. C. Cassells drafted the article.

Acknowledgments

We are grateful to the families who have been participating in this research for two decades. We thank Jana Cooperman, Kim English, Missy Globerman, Matt Kleinman, Rebecca Kurland, Melissa Medoway, Tina Merilees, Chanelle Richards, Adam Rohksar, and Amy Schreier for their assistance with data collection.

Declaration of Conflicting Interests

The authors declared that they had no conflicts of interest with respect to their authorship or the publication of this article.

Funding

This research program is supported by the W. T. Grant Foundation, the John D. and Catherine T. MacArthur Foundation Network on Socioeconomic Status and Health, and the National Institute of Minority Health and Health Disparities (5RC2MD 00467).

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