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Parenting as a moderator of the effects of cumulative risk on children's social-emotional adjustment and academic readiness

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Abstract

This study examined whether parenting moderated the association between cumulative risk and preschool children's adjustment problems, social competence and academic readiness. The sample consisted of 306 families representing the full range of income, with 29% at or near poverty and 28% lower income. Cumulative risk and observed maternal parenting behaviors were assessed when the children were 36–40 months, and teachers rated outcomes at 63–68 months. Greater cumulative risk was more strongly related to higher adjustment problems when scaffolding was low, and unrelated when it was high, suggesting a protective effect. Consistent limit setting was associated with higher academic readiness regardless of risk level, and at low levels of risk it was associated with the highest levels of social competence. A pattern potentially indicating differential effectiveness emerged for warmth, such that at lower levels of risk, higher warmth was associated with better outcomes, but at higher levels of risk, it was associated with higher levels of problems and poorer social competence and academic readiness. Results suggest that buffering effects of particular parenting behaviors, both alone and in combination, may be context-specific.

Keywords

parenting; cumulative risk; income; preschool; social-emotional adjustment

The cumulative burden of multiple contextual risk factors is one critical mechanism by which experiences of low income negatively impact families, increasing children's likelihood for adjustment problems. Indices of cumulative risk take into account the additive impact of factors such as residential instability, household chaos or overcrowding, poor nutrition, single parenthood, divorce or separation, teenage parenthood, low parental education, parental under- or un-employment, parental psychopathology, exposure to environmental toxins, neighborhood danger and negative life events (Ackerman, Brown, & Izard, 2004; Atkinson et al., 2015; Deater-Deckard, Dodge, Bates, & Pettit, 1998; Evans, 2004; Evans, Li, & Whipple, 2013; Grant et al., 2003). Experiencing higher levels of cumulative risk has also been shown to disrupt parenting, which may be another key mechanism by which risk is conferred to children in contexts of disadvantage. Indeed, many

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studies have found evidence for parenting as a mediator of the impact of low income and cumulative risk on children's adjustment (Bornstein & Bradley, 2003; R. D. Conger et al., 2002; Dumka, Roosa, & Jackson, 1997; Gershoff, Aber, Raver, & Lennon, 2007; Lengua, Honorado, & Bush, 2007; McLoyd, 1990, 1998; Mistry, Vandewater, Huston, & McLoyd, 2002; Reising et al., 2013; Trentacosta et al., 2008). However, the associations among cumulative risk, parenting, and child outcomes, tend to be modest to moderate, indicating that not all parenting is adversely impacted by increased contextual risk. This suggests that when aspects of effective parenting are maintained or preserved in contexts of higher risk, such parenting practices may mitigate the impact of cumulative risk on children's outcomes. On the contrary, ineffective parenting in such settings may further exacerbate the effects of cumulative risk, leading to even worse child outcomes.

It is important to note that the term effective parenting is used here to refer to parenting that is broadly associated with lower levels of adjustment problems and higher levels of social competence and school readiness. We approached the question agnostically, because there is some preliminary evidence, reviewed below, which suggests that behaviors constituting "effective" parenting are not universal. Researchers have called for "careful investigations of how the effectiveness of specific parenting practices varies as a function of [socialization] context" (Darling & Steinberg, 1993, p. 495). In other words, parenting behaviors may operate differently across levels of risk and we must consider them within the family's broader context. Most of the literature examining these relations has focused on low-income populations characterized by high levels of cumulative risk, which limits our ability to generalize the nature of the interactions between parenting and risk across the full spectrums of income and risk. Further, because not all families experiencing low income also experience high levels of cumulative risk, it is important to disentangle their effects. Thus, the current study sought to clarify the moderating role of effective parenting practices on indicators of early childhood well-being (adjustment problems, social competence, and academic readiness) across levels of cumulative risk, over and above the effects of income.

Cumulative Risk

Researchers have increasingly recognized that low income does not primarily exert its effects directly on children's experience, but rather indirectly through the cumulative psychosocial risk factors associated with financial strain as described above. Prior research supports the use of a cumulative risk score over individual, additive risk factors in explaining variance in child outcomes, as the accumulation of multiple challenges captured by a cumulative risk score has been repeatedly shown to have a greater effect on development (Ackerman, Izard, Schoff, Youngstrom, & Kogos, 1999; Rutter, 1979; Sameroff & Rosenblum, 2006). While there is no one standard approach to quantifying the burden of multiple risks, a summed cumulative risk score that includes environmental factors theoretically and empirically linked to the outcome of interest is widely used, as it is parsimonious and agnostic as to the relative importance or interaction among risk factors (Evans et al., 2013).

Cumulative Risk and Parenting

A meta-analysis by Grant and colleagues, which found significant evidence for parenting mediating the relation between poverty and its related stressors and child outcomes across 46 studies, called for the integration of direct and indirect mechanisms of risk in conceptual models and the importance of including both moderating and mediating factors (Grant et al., 2003). Two major models account for how these cumulative elements of low-income, high-risk contexts might affect children (see Yeung, Linver, & Brooks-Gunn, 2002). First, the family investment model suggests that parents' time, attention and emotional resources may simply be overtaxed by addressing the burdens described above, leaving less available to devote toward children's enrichment and nurturance of the parent-child relationship (R. D. Conger & Donnellan, 2007).

Second, evidence across different demographic groups and cohorts supports a family stress model, which asserts that economic-related stressors increase parental psychopathology and conflict, leading to parenting characterized by low warmth, high hostility and poor behavioral management, which in turn account for increased child adjustment problems (K. J. Conger, Rueter, & Conger, 2000; R. D. Conger et al., 2002; R. D. Conger & Elder, 1994; Gonzales et al., 2011; McLoyd, 1990). Parents of low-income households are more likely to use ineffective discipline strategies (Bank, Forgatch, Patterson, & Fetrow, 1993), to be less responsive or involved (Bolger, Patterson, Thompson, & Kupersmidt, 1995; McLeod & Shanahan, 1993), and to use hostile or harsh discipline including control-oriented strategies and corporal punishment (Dietz, 2000; Jansen et al., 2012; McLeod & Shanahan, 1993; Pereira, Negrão, Soares, & Mesman, 2013; Ricketts & Anderson, 2008), which in turn have been associated with poorer child adjustment outcomes. In the extant literature, limited parental investment and/or the direct effects of income have been more often associated with children's cognitive outcomes, whereas stress-disrupted parenting has been more often tested as a mediator of the relation between contextual risk and children's behavior problems (Linver, Brooks-Gunn, & Kohen, 2002; Mistry, Biesanz, Taylor, Burchinal, & Cox, 2004). However, it is important to note that most of these studies show modest to moderate effects of income or cumulative risk on parenting, suggesting that, although there is a greater likelihood of disrupted parenting in a low income or higher risk context, there is also a substantial likelihood of effective parenting despite risk. Thus, we had reason to believe that examining moderation effects might capture a more nuanced model of the relations of parenting and context with child adjustment outcomes. This approach is in line with models of resilience, which posit that even in the presence of environmental risk factors (e.g., residential instability, low maternal education, negative life events, etc.), children may be buffered by protective factors (e.g., effective parenting) that contribute to better outcomes than might otherwise be expected in the presence of such risk.

Evidence for Parenting Moderating Risk

Several studies suggest that normative parenting practices vary among different socioeconomic levels or ethnic populations (Burchinal, Vernon-Feagans, Cox, & Key Family Life Project Investigators, 2008; Kelley, Power, & Wimbush, 1992; Weis & Toolis, 2010), though not all studies find such differences (e.g., Magnus, Cowen, Wyman, Fagen, & Work,

1999; Querido, Warner, & Eyberg, 2002). In general, these findings seemed to suggest that when families are at greater risk (whether related to ethnic background, socioeconomic disadvantage or neighborhood safety, which are problematically often confounded in American study populations), parent-centered and authoritarian discipline approaches, along with lower warmth, might be more common. These associations raise the question of whether such strategies might be particularly adaptive in high-risk environments. However, despite identifying different frequencies of parenting behaviors, fewer studies actually examine whether or not those parenting behaviors were differentially related to child outcomes across different contexts (Hill, 2006), which is the principal question asked by the current study.

Given that cumulative risk is generally associated with less effective parenting, it is plausible that when effective parenting is maintained in high-risk contexts, it might serve as a protective factor, buffering children against the impact of risk. Indeed, authoritative parenting styles, high in both warmth and structure, have been associated with children's resilience (Masten & Coatsworth, 1998). Conversely, ineffective parenting might exacerbate or worsen the effects of risk, or might present another additive risk factor. As suggested by other studies that have demonstrated the influences of environmental risk and parenting on child adjustment in children as young as 5–6 years old (Heberle, Krill, Briggs-Gowan, & Carter, 2015; Smeekens, Riksen-Walraven, & van Bakel, 2007), this may be particularly true during early developmental periods, when parents have some ability to filter and influence children's experiences of environmental risk factors or stressful life events. Tests of parenting as a moderator are required to formally investigate this hypothesis. The few existing studies that have examined the moderating effects of parenting on the relation between income-related cumulative risk and young children's adjustment, social competence and academic readiness are reviewed below.

Notably, there is wide variety in the conceptualization and measurement of risk and parenting constructs, limiting generalizable patterns of moderation across studies. Some studies assess global parenting styles (e.g. authoritarian, authoritative, permissive, harsh) while others examine separable dimensions (e.g. warmth, behavioral limit-setting, psychological control, responsiveness, sensitivity). Generally, most dimensional models include two broad categories: affective qualities of parenting, and parental behavioral/control strategies. Many of the extant studies in this literature do not include multiple, quantifiable aspects of parenting, or use parenting constructs that are not separable across the affective and control dimensions, rendering it difficult to isolate or identify which behaviors are responsible for the observed effects.

A limited number of studies have examined the effects of affective dimensions of parenting on the link between cumulative risk and adjustment outcomes, yielding some evidence for buffering effects of positive affective behaviors and exacerbating effects of negative affective behaviors. A longitudinal study spanning kindergarten to 6th grade found that supportive parenting buffered against the effects of socioeconomic risk on later externalizing problems (Pettit, Bates, & Dodge, 1997). Specifically, kids at higher risk showed lower levels of externalizing problems when higher levels of supportive parenting were present, while there was no such effect in families at lower risk. This was consistent with a study of first-graders

which found parent positive emotionality buffered the relation between cumulative risk and total child problems as rated by teachers, though specific affective parenting behaviors were not assessed (Ackerman et al., 1999). Harsh parenting was more strongly associated with children's internalizing problems at higher levels of neighborhood dangerousness (Callahan, Scaramella, Laird, & Sohr-Preston, 2011), and both internalizing and externalizing problems were greater for children experiencing both high environmental risk and harsh parenting (Flouri & Midouhas, 2017). However, harsh parenting includes qualities of both negative emotionality and intrusive control, making it impossible to parse the effects of the affective versus behavioral components. This is critical because there is evidence that the presence of multiple parenting dimensions may moderate one another's effects: harsh parenting was *not* associated with later externalizing problems when parents were also high in warmth (Germán, Gonzales, Bonds McClain, Dumka, & Millsap, 2013).

Other studies examining behavioral or control-related parenting dimensions provide some preliminary evidence that responsive, involved parenting can buffer children against environmental risk factors. One study examining the moderating effects of early maternal responsiveness at 3 months of age on behavioral outcomes at 2, 4.5 and 8 years found that in families at higher psychosocial risk, high maternal responsiveness attenuated the impact on total and externalizing problems, while it did not show an effect at low levels of psychosocial risk (Laucht, Esser, & Schmidt, 2001). This converges with other lines of research suggesting that maternal responsiveness moderates the impact of cumulative risk on allostatic load, a measure of several physiological adaptations that may account for the long-term physical and psychological effects of stress on health outcomes (Evans, Kim, Ting, Tesher, & Shannis, 2007). Parental involvement has also been found to moderate the relation between risk and adaptive behavior in a population of adopted children, where again, parenting related more strongly to outcomes for the higher-risk compared to lower-risk children (Kriebel & Wentzel, 2011). Surprisingly, parenting control dimensions such as consistency, harsh discipline, permissiveness and psychological intrusiveness were not related to child outcomes in this sample. Turning finally from behavioral to academic outcomes, no studies were found that examined how parenting moderates risk to predict kindergarten readiness, which in turn predicts later school achievement (Duncan et al., 2007). However, several identified buffering effects of consistent discipline, responsive parenting and warmth among high-risk students at older ages (Burchinal, Roberts, Zeisel, Hennon, & Hooper, 2006; Burchinal, Roberts, Zeisel, & Rowley, 2008; Gutman, Sameroff, & Eccles, 2002), suggesting that there is reason to examine these relations earlier in development.

Supplementing this relatively limited literature on cumulative risk and parenting are a number of studies that have found parenting to moderate other specific risk exposures that also threaten children's well-being. In terms of exacerbating factors, harsh or rejecting parenting and family conflict have been shown to moderate the relation between parents' and children's mental health outcomes (Conners-Burrow et al., 2013; Zalewski, Thompson, & Lengua, 2015). On the other hand, several studies have documented protective effects of positive parenting in contexts of violence exposure and abuse (Afifi & MacMillan, 2011; Corbett, 2013; Garrido & Taussig, 2013). Other studies found no support for parenting

buffering risk experiences such as bullying and discrimination (Bilsky et al., 2013; Kam & Bámaca-Colbert, 2013).

These mixed findings do not appear to be systematically related to the particular parenting or outcome constructs examined, and thus highlight the complexity of defining particular parenting behaviors and determining when and for whom they will have a beneficial effect (Collins, Maccoby, Steinberg, Hetherington, & Bornstein, 2000). Yet, if we are to ultimately implement parenting interventions that aim to support families in low-resource and/or higher-risk contexts, evidence clarifying whether and how effective parenting moderates risk is needed.

This Study

The current study examined the moderating effects of parenting on the relations between cumulative risk and preschool children's adjustment problems, social competence, and academic readiness. It critically expands on the limitations of the existing literature in several important ways: by examining the relations between cumulative risk, parenting and child outcomes in a longitudinal framework used in only a handful of other studies. Participants were recruited across the full range of the income spectrum, including over-sampling families experiencing poverty and low income, in order to capture a range across the continuum of risk exposures. We examined multiple, specific parenting behaviors rather than single dimensions or global ratings in order to differentiate those that have a significant protective effect, across both affective (maternal warmth and negative affect) and behavioral (scaffolding, consistent limit-setting and responsiveness) aspects of parenting. These were observed and coded by independent raters, which eliminates the possibility of bias introduced by parent or child ratings of parenting. We collected ratings of child outcomes from teachers rather than parents for the same reason. In contrast to much of the prior literature looking at middle school and adolescence, this study examines these constructs across the preschool period, which is important because we expect that parents will have their most pronounced effects in buffering children from contextual risk earlier in childhood as compared with preadolescence or adolescence, when other contextual influences such as school, peers and neighborhoods will have increasingly direct impacts (Trentacosta et al., 2008). From a prevention perspective, understanding these potential interactions among parenting behaviors and other risk factors early in childhood is critical as it can inform interventions aimed to preempt the further development of problems.

Based on the heterogeneity and scarcity of the existing literature, it was challenging to make specific predictions about which parenting behaviors might condition the relation between risk and adjustment outcomes. We hypothesized that the maintenance of warmth and positive control behaviors including scaffolding, limit-setting and responsiveness in the presence of higher cumulative risk would have a protective effect, buffering the effects of risk on child outcomes. We predicted that negative affect would be associated with poorer outcomes regardless of risk level. However, a key exploratory question of this study was whether parenting behaviors that are generally considered effective operate differently in higher- vs. lower-risk contexts.

Method

Participants

Participants were 306 mothers and their 36–40 month-old children (M = 37, SD = 0.84) who were part of a larger study of the relations among income, parenting and child effortful control and adjustment. Families were recruited from various sources, including a university-hospital birth register, daycares, preschools, health clinics, and charitable agencies. The group was recruited to obtain equal representation across income levels. The 2009/2010 Federal HHS Poverty Guidelines, in place at Time 1 (T1), which is an income-to-needs ratio based on the number of people in the home, was used to recruit the sample and characterize the income levels represented in the sample. The distribution included 29% of the sample at or near poverty (n = 90 at or below 150% of the federal poverty threshold), 28% lower income (n = 84 between 150% poverty and the local median income of $58K), 25% middle- to upper-income (n = 77 between the median income and $100K), and 18% affluent (n = 54 above $100K). To participate, families were required to have reasonable proficiency in English to comprehend the assessment procedures, and children diagnosed with a developmental disability were excluded.

Participants included 50% girls. The racial and ethnic composition of the sample of children included 64% European American, 10% Latino or Hispanic, 9% African American, 3% Asian American, 2% Native or American Indian, and 12% multiple racial and ethnic backgrounds or other. Mothers' educational distribution included 3% mothers with some high school attainment, 6% completed high school, 34% with some college, technical school or professional school, 30% college graduates, and 27% with post-graduate education. Eighty-one percent of mothers were married or had long-time partners, 12% were never married, 7% were separated, divorced or widowed and were single heads-of-household.

All participants had complete income data. Complete data were available for 96% of participants on cumulative risk, 94% on parenting, and 77% on T2 teacher reported adjustment problems, social competence and academic readiness. At T2, 293 (96%) of the original 306 families participated in the assessment, highlighting minimal attrition of the sample over time.

Procedures

Families were assessed in offices on a university campus. As part of a broader study of income, risk, effortful control and parenting, they were assessed at 4 time points each separated by 9 months. This study uses data from the 1st (T1) and 4th (T2) time points, when children were 36–40 and 63–68 months, respectively. With approval by the Human Subjects Institutional Review Board, both active parental consent and child assent were secured prior to data collection. Assessments for the broader study included neuropsychological, behavioral, and questionnaire measures administered by trained experimenters. After children and mothers completed separate assessments, mothers joined children to engage in parent–child interactions. Families received $70 for their first assessment, and compensation increased by $20 for each subsequent assessment. Teachers were asked to complete behavior rating scales on study children and were compensated $15 for completing the questionnaires.

Measures

Descriptive statistics for the measures are presented in Table 1.

Income—At T1 mothers reported on household income from all sources on a 14-point Likert scale that provided a fine-grained breakdown of income at the lower levels facilitating identification of families at the federal poverty cutoff using an income-to-means ratio (e.g. 1 = $14,570 or less, 2 = $14,571–$18,310, 3 = $18,311–22,050, etc.). The 14-point variable representing the full range of income was used and the mean income score was 8.75 (*SD* = 3.93; range: 1.00 – 14.00,), representing an income in the range of $37,000–48,000.

Cumulative risk—Cumulative risk included eight risk factors that were selected for their demonstrated relevance to experiences of low income and child outcomes: maternal education, single parent, adolescent parent, residential instability, family structure transitions, household density, negative life events, and maternal depression. Five dichotomous risk factors (maternal education, single parent, adolescent parent, residential instability, divorce) were scored as 0 = not present, 1 = present. Three continuous risk factor scores (household density, negative life events, maternal depression) were converted into proportions of the total possible score so that they ranged from 0 to 1, and thus, were on a similar scale as the dichotomous variables so that values could be summed to create a total risk score. We allowed these variables to remain continuous to avoid artificially dichotomizing on scales for which there are not well-established cut-offs to guide what separates “risk” from “no risk”. Using this approach, compared to dichotomizing all components of the cumulative risk score, has little or no impact on the associations of cumulative risk with other variables, as the rank order of participants’ scores are maintained in either scoring approach. A total cumulative risk score was the sum of all component factors. The average cumulative risk score was 0.90 (SD = 0.81, range = 0 – 4.5.[1]

Mothers’ educational attainment of less than a high school diploma was considered a risk factor (3% of the sample). Mothers reported on marital status and were identified as single parents if the mother indicated she was never married, currently widowed, separated or divorced, or had a live-in partner for <1 year (19%). Mothers reported their age at the time of the study child’s birth, and 3% were considered adolescent parents given they were ≤19 years when the child was born. Residential instability was indicated by the family changing households ≥3 times in the previous 3 years (10%). Family structure transitions were indicated by mothers reporting being divorced in the child’s lifetime (3%).

Household density was calculated as the number of individuals living in the home divided by the number of rooms in the home. The score was converted to a proportion of the highest

[1]To provide a different perspective on the range of risk in the sample, we also calculated frequencies of the categorical count of risk factors: 56.5% had 0 risk factors, 27.5% had 1, 9.8% had 2, and 7.2% had 3 or 4 of a total 8 possible. For the sake of comparison with other cumulative risk scoring methods, we calculated frequency scores *including* poverty and racial/ethnic minority status: the frequencies were nearly identical to those reported for low-income children under age 6 by the National Center for Children in Poverty (39% had 0 risk factors, 46% had 1–2, and 16% had 3+), suggesting that although we used a different scoring mechanism, the underlying data from our sample was representative in terms of distribution of risk (for further discussion of cumulative risk see Evans, Li & Whipple, 2013).

score in the sample. The average ratio was .52, indicating that, on average, there were twice as many rooms as individuals in the home.

Negative life events were assessed with parent report on the General Life Events Schedule for Children (Sandler, Reynolds, & Ramirez, 1986). The 29 events are moderate to major negative events including changing schools, death of a family member or friend, parental arrest, and loss of friends. Parents reported the occurrence of events within the previous 9 months. The average number of negative life events was 5.3 (*SD* = 4.0; range: 0–26), and total scores were the number of events converted into a proportion of the possible 29 events.

Mothers reported on their depressive symptoms over the previous month using the 20-item Center for Epidemiological Studies–Depression Scale (CES-D: Radloff, 1977), designed to measure depressive symptoms in the general population. Participants indicated whether each symptom was present on a scale of 0 (rarely/never) to 3 (most of the time), and the items were summed for a total score. Internal consistency was .88. The average score was 10.01 (*SD* = 8.38, range: 0 – 46.67). The total score was converted into a proportion of the total possible score of 60.

Parent-child interaction—Mothers and children engaged in 4 activities (7 minutes restricted play, 7 minutes free play, 7 minutes instructional activity, 3 minutes clean-up; Kerig & Lindahl, 2001). In restricted play, mothers were instructed to allow the child to play with toys in the room except those in a specified place, a freely accessible shelf of highly desirable toys. This was followed by free play in which mothers and children were informed that they could now play with the previously restricted toys. Next, mothers were instructed to help children build a challenging Lego figure. Finally, mothers were to obtain children's assistance in cleaning up.

Coded behaviors were selected *a priori* based on existing literature on the relation between parenting and adjustment. Warmth, negativity, limit-setting, scaffolding, and responsiveness were each independently coded in 1-minute epochs for all segments, and then averaged across epochs and across segments. Parenting was coded from videotapes by advanced undergraduates using a coding system that was adapted from established coding systems: System for Coding Interactions and Family Functioning (SCIFF: Lindahl & Malik, 2000), Parenting Style Ratings Manual (Cowan & Cowan, 1992), and Parental Warmth and Control Scale—Revised (Rubin & Cheah, 2000) and used previously by this research team (*redacted for review*). All behaviors were rated on 6-point scales (0 = absent/lowest, 5 = highest). Positive affect captured the frequency and level of behavioral and verbal expressions of happiness, comfort, connection, and warmth toward the child. Interactiveness assessed the quantity of verbal and non-verbal engagement. Positive affect and interactiveness were combined into a measure of warmth. Negativity assessed the negative tone or tension expressed by the mother and included verbal and non-verbal expressions of irritation or frustration with the child that were critical, rejecting or invalidating. Limit-setting assessed mothers' clarity, consistency, and follow-through of directives when children were noncompliant, oppositional, or disruptive. Scaffolding was a combination of guidance/structuring, encouragement of autonomy, and low negative/intrusive control. In effect, scaffolding reflected the parent's ability to intervene when the child needed it and to

disengage when the child was functioning independently. Responsiveness to children's expressions of negative affect indicated mothers' sensitivity to cues of the child. Inter-rater reliability was assessed by independent recoding of 20% of the interactions. Intra-class correlations (ICCs) for warmth, negativity, limit-setting, scaffolding and responsiveness were .80, .75, .73, .81, and .67, respectively.

Child adjustment—At T1, teachers rated children's adjustment problems, social competence and at T2 they rated these as well as academic readiness. Teachers rated children's adjustment problems and social competence using the preschool teacher report form of the Social Skills Rating System (SSRS: Gresham & Elliot, 1990). They completed 19 items that assessed children's adjustment problems, including internalizing and externalizing problems and hyperactivity (α = .87), such that a higher score indicated more problems. Teachers rated children's cooperation (e.g., puts away toys, helps with tasks; 12 items), assertiveness (e.g., self-confident, introduces self; 8 items) and self-control (e.g., controls temper, attends to instructions; 10 items) for a social competence score (30 items) in which a higher value indicated greater social competence. The internal consistency for the composite social competence scale was .91.

Teachers rated children's academic readiness using the School Readiness Survey (National Household Education Survey, 2007) in which teachers report on 9 items indicating children's ability to identify colors and letters, count, write their names, hold a pencil correctly, produce intelligible speech, and recognize letter sounds. A higher score indicated greater school readiness.

Results

Analytic Plan

Analyses were conducted to test whether parenting moderated the relations of cumulative risk with children's adjustment problems, social competence, and academic readiness. Multiple regression analyses were used to test the direct effects of covariates (child gender, T1 adjustment, family income), cumulative risk and parenting (warmth, negativity, limit-setting, scaffolding, responsiveness), and the parenting x cumulative risk interactions, entered simultaneously, predicting child outcomes. Income was included as a covariate, rather than a component of the cumulative risk score, because a key aim of the larger study from which these data are drawn was to examine contextual risk as one mechanism accounting for the effects of low income on children's developmental outcomes. Interaction terms were calculated by multiplying the mean-centered variables in the term. Regressions were conducted in Mplus 6.0 (Muthen & Muthen, 2010) using Full Information Maximum Likelihood Estimation (FIMLE), which uses all the data available simultaneously to calculate parameter estimates. Participants missing data on one or more study variables (n = 96) were compared with those with no missing data (n = 210) to assess the extent of bias introduced by missing data. Dummy-coded missingness was not related to key study variables including income, cumulative risk, parenting and adjustment outcomes. This pattern of missingness, yielding no evidence that the data were missing not at random, along with the overall limited extent of missing data (i.e., < 25% on key variables), suggested that

the dataset would be robust to the assumptions of FIMLE and that unbiased estimates could be generated (Enders & Bandalos, 2001). Therefore, families with any data were included in analyses ($N = 306$).

Descriptive Statistics and Correlations

Descriptive statistics for the study variables and correlations among them are reported in Table 1. There were modest to moderate correlations of cumulative risk with higher maternal negativity and lower consistent limit-setting and scaffolding. Cumulative risk and parenting were moderately correlated with adjustment problems, social competence and academic readiness, suggesting that they were plausible predictors of adjustment. However, correlations were not so large in magnitude as to suggest that moderation was implausible.

It is important to comment on the exclusion of racial or ethnic minority status in the analyses. Unfortunately, the parent study was not designed to test racial or ethnic differences in the proposed associations. Thus, although the sample is racially and ethnically diverse, each racial or ethnic minority group constitutes less than 10% of the total sample, resulting in insufficient power to test for differences in interaction effects across groups. Further, some associations between membership in specific racial or ethnic groups and other study variables were of differing magnitudes and directions, such that collapsing groups into an ethnic minority status variable would not accurately represent the data. In addition, African American families were disproportionally represented among the lower-income families in the study, resulting in a potential confound of race and income.

Tests of Parenting as a Moderator of the Effects of Cumulative Risk

Results of regression analyses are presented in Table 2. Covariates, predictors and interaction effects were entered simultaneously in regression equations predicting adjustment problems, social competence and academic readiness. All five parenting variables were entered in each model, providing a test of the unique effects of each parenting variable above the effects of all other parenting variables. Male gender was related to higher adjustment problems and lower social competence. T1 adjustment problems predicted T2 adjustment problems, and T1 social competence was significantly related to T2 social competence and academic readiness. The only significant direct effect of parenting was consistent limit-setting predicting higher academic readiness. Otherwise, other direct effects of cumulative risk or parenting were non-significant in the presence of the interaction effects, despite significant zero-order correlations of cumulative risk and parenting with adjustment.

However, several interactions were significant. Parental warmth moderated the associations of cumulative risk with all three outcome variables, with some of these relations in an unexpected direction (Figure 1). For adjustment problems, cumulative risk was unrelated to problems at lower levels of maternal warmth ($b = -0.30$, $t = 0.86$, *ns*), although children who experienced lower maternal warmth had higher average adjustment problems, whereas, cumulative risk was significantly, positively related to adjustment problems for children whose mothers demonstrated higher warmth ($b = 3.14$, $t = 3.01$, $p < .05$), with the lowest levels of problems in children who experienced low cumulative risk and high warmth. The

pattern was very similar in predicting social competence. Cumulative risk was not significantly related to social competence when mothers were lower in warmth ($b = 2.82$, $t = 1.65$, *ns*) but was negatively related to social competence when mothers were higher in warmth ($b = -5.74$, $t = -3.51$, $p < .05$). When contextual risk was higher, children had the lowest levels of social competence when their mothers were higher in warmth, and higher levels of social competence when their mothers were lower in warmth, whereas in a lower-risk context, higher maternal warmth was associated with higher levels of social competence. The associations with academic readiness followed the same pattern. Cumulative risk was not significantly related to academic readiness when mothers were lower in warmth ($b = 0.57$, $t = 0.84$, *ns*) but was negatively related to academic readiness when mothers were higher in warmth ($b = -1.71$, $t = -2.59$, $p < .05$). In a higher-risk context, children demonstrated lower levels of academic readiness when mothers were higher in warmth, whereas in a lower-risk context, children demonstrated higher levels of competence when mothers were higher in warmth.

Maternal scaffolding also moderated the association of cumulative risk with both social competence and academic readiness (Figure 2). In predicting social competence, cumulative risk was significantly related to lower social competence when parents were low in their use of scaffolding ($b = -4.26$, $t = 2.38$, $p < .05$), whereas cumulative risk was not significantly related to social competence when mothers were higher in their use of scaffolding ($b = 1.64$, $t = 0.66$, *ns*). In predicting academic readiness, cumulative risk was negatively related to children's academic readiness when mothers used scaffolding less ($b = -1.53$, $t = -2.67$, $p < .05$), whereas cumulative risk was unrelated to academic readiness when mothers demonstrated higher levels of scaffolding ($b = 0.39$, $t = 0.48$, *ns*). Children's academic readiness was higher across levels of cumulative risk when mothers used more scaffolding, and children's academic readiness was lowest in higher-risk contexts when mothers used less scaffolding.

Finally, maternal consistent limit-setting moderated the association of cumulative risk with social competence (Figure 3), and there was a trend toward a significant interaction effect of consistent limit-setting and cumulative risk predicting adjustment problems. For social competence, when mothers were lower in consistent limit-setting, cumulative risk was unrelated to social competence ($b = 1.02$, $t = 0.68$, *ns*), and children had lower levels of social competence regardless of level of contextual risk. When mothers were higher in consistent limit-setting, cumulative risk was significantly negatively related to social competence ($b = -3.94$, $t =$ v2.22, $p < .05$), with children in low-risk contexts demonstrating the highest levels of social competence.

Discussion

Elevated levels of contextual and psychosocial risk associated with a low-income environment have been associated with differences in parenting, and thus, to directly and indirectly predict adjustment outcomes for children. While evidence suggests that some parenting may be significantly disrupted in high-risk contexts, the modest strength of those associations leaves room for the possibility of moderating influences, and few studies have examined these interactions across a continuous range of risk exposure. If effective and

appropriate parenting behaviors can be maintained in spite of cumulative risk factors, children may be buffered from its impact. This study explored how cumulative risk and parenting interact to predict preschool children's adjustment in terms of adjustment problems, social competence and academic readiness. First, findings supported existing evidence that risk is associated with what are traditionally considered less effective parent behaviors: risk was positively correlated with maternal negativity, and negatively related to consistent limit-setting and scaffolding. There was a significant promotive effect of consistent limit-setting such that it predicted higher academic readiness, with a trend toward an effect on higher social competence. Cumulative risk and parenting behaviors were associated with child outcomes, but not at a level that precluded the possibility of moderation, and in fact, there were several significant interactions. When probing those interaction effects, interesting patterns emerged for maternal warmth, scaffolding, and consistent limit-setting, which may point to the differential effectiveness of these behaviors across contexts.

Maternal warmth moderated the effects of risk on all three child outcomes measured, such that in the presence of high warmth, higher cumulative risk was positively related to problems and negatively related to social skills and academic readiness. At lower levels of warmth, risk was not associated with outcomes. This finding, while at first counter-intuitive, suggests that in contexts of relatively higher risk, warmth alone does not support positive child outcomes. It is important to note that the zero-order correlations indicated that warmth was related to lower adjustment problems, as expected. However, once other parenting behaviors were accounted for in the model, no significant main effects of warmth on adjustment remained. This suggested that the relation between parental warmth and child adjustment was complex and depended on the other parenting behaviors and the level of risk in the context. Our findings contrast with those of Burchinal (2008), who found that a composite measure of parenting including warmth was protective against teacher-rated externalizing problems in high-risk contexts. However, differences in measurement of warmth and other parenting (along with demographics like race, child age and geographic region, and the severity of cumulative risk) may in part account for these discrepant findings, as that study did not examine the net effect of warmth controlling for behaviors like limit-setting. It is also important to consider that our measurement of lower versus higher warmth is based on within-sample distribution, and therefore the absolute level of warmth captured here does not take into account cultural or ethnic norms. In addition, our ratings of warmth were obtained from observations of parent-child interactions in research offices. It is possible that the assessment context resulted in different meaning of demonstration of warmth in families across income or risk levels. While it is important to consider the possibility indicated by these data that warmth operates differently across different contexts, whether characterized by risk level, ethnicity, income, etc., this remains an unexpected finding and must be replicated.

In line with our hypotheses, we found a buffering or protective effect of parental scaffolding: at lower levels, higher cumulative risk was linked to poorer social competence and academic readiness, whereas risk was not associated with these outcomes at higher levels of scaffolding. Children demonstrated higher levels of social competence and academic readiness at higher levels of scaffolding. This suggests that through scaffolding, parents may

be able to mitigate some of the effects of risk on these important early measures of child functioning. As measured here, scaffolding represented a balance of guidance and structuring with autonomy-granting when appropriate, allowing children increasing independence to develop social and academic skills. This may be a particularly effective and important parenting skill in higher-risk contexts in that granting appropriate and increasing levels of independence across development gives children the opportunity to build experience and mastery in managing challenges and stressors they will undoubtedly face. No other known studies have specifically measured scaffolding as a moderator. Future research should aim to replicate and expand on how scaffolding might serve a protective function in moderate- to higher-risk settings and if so, how it can be incorporated into parenting interventions.

Contrary to our hypothesis, we did not find a buffering effect of limit-setting. Instead, lower levels of consistent limit-setting were associated with lower social competence regardless of level of risk. Unexpectedly, higher consistent limit-setting was not protective for children in a higher-risk context, whose levels of social competence were similar to those of children whose parents were lower in limit-setting. Taken together with the main effect on academic readiness, these patterns suggest that consistent limit-setting is associated with higher social and academic competence, however, perhaps only for children in low-risk contexts. A similar trend-level association was found for adjustment problems, suggesting the relevance of consistent limit-setting to a range of child outcomes. Though not measured in exactly the same way, consistent limit-setting likely represents some of the same behaviors captured by an authoritative parenting style or consistent discipline and thus this finding extends previous work (Gutman et al., 2002; Masten & Coatsworth, 1998).

This study was strengthened by its use of a large, representative community sample and longitudinal measurement across the preschool period. Also important was the use of several discrete, observed parenting behaviors that were independently rated so as to limit the effects of reporter bias. We included several teacher-rated outcomes that have been shown to be important in and of themselves but also as further predictors of children's later childhood and adolescent functioning. One major limitation is that we were unable to examine the effects of ethnicity or culture, which some studies suggest play an important role in shaping the use of different parenting behaviors and which may be an important additional moderator in the relations between cumulative risk, parenting and child outcomes. Our sample, while ethnically diverse, was not sufficiently powered to conduct further moderation analyses *within* ethnic or racial groups. Given demonstrated differences within our sample in terms of income, contextual risk and parenting across different races, it was inappropriate to group ethnic minorities together. We regret that because of the uneven stratification of income and risk level by race, our study is not able to fully address these questions and it will be critical for future studies to consider this in their designs. While we did oversample families experiencing poverty and lower income, the range of cumulative risk scores in families able and willing to participate in a longitudinal research study may have been somewhat truncated, possibly limiting how well our results generalize to families experiencing the highest levels of risk. Because our study was designed to look at the relations of contextual risk and parenting across a range of risk levels, it is not directly comparable to studies conducted solely within low-income or high-risk populations. Nonetheless, our findings do

confirm that it is necessary to consider the impact of even moderate contextual risk in understanding the differential effects of particular parenting behaviors.

Future studies will be needed to replicate the effects of consistent limit-setting, warmth and scaffolding that emerged in this sample. The moderation effects found for warmth, which are counterintuitive, likely reflect the complex interplay among parenting behaviors both within and across contexts, and merit further study. Specifically, future studies ought to carefully recruit a range of participants such that the effects of income, cumulative risk and race or ethnicity can be parsed apart, and that there is representation across the range of income and risk levels for each ethnic group included, given the varied meaning and importance of particular dimensions of parenting within different cultures (Hill, 2006). Given the varied patterns that emerged, it is important to study multiple specific parenting behaviors to understand which are going to be effective, in which combinations, in different environments.

Based on general findings for parenting related to child adjustment, we would predict that greater parental consistency, limit setting, and scaffolding are likely also required in combination with warmth to support children with greater vulnerability for adjustment problems due to environmental risk factors, but extant studies have not borne this out. Few if any studies have examined constellations of parenting behaviors as predictors of child outcomes, which may provide more ecologically valid and more useful data compared to analyzing the independent effect of each parenting behavior, as these behaviors do not occur in isolation. This level of specificity will also be necessary in order to develop and deliver focused parenting interventions across contexts with varying levels of risk that emphasize and promote the behaviors most critical to child outcomes. For example, this study provided initial evidence that consistent limit-setting and scaffolding may be among the more important behaviors to increase or support in parents raising children in the presence of environmental risk factors. While extant parenting interventions nearly universally include limit-setting, aspects of scaffolding such as increased guidance and structuring, reduced intrusive control, and increased respect for child autonomy are not always explicitly identified as behavioral targets. If effective parenting is shown to be a buffer against the effects of cumulative risk, teaching or bolstering these skills will be a critical means by which to reduce the burden of risk on children and promote positive functioning for families.

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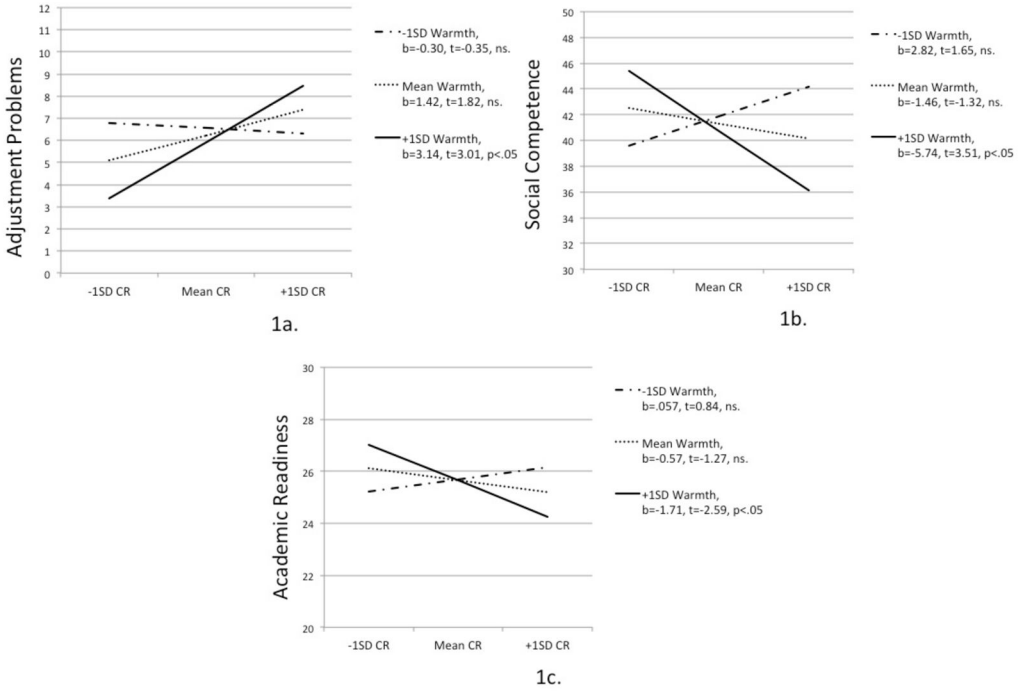

Figure 1.

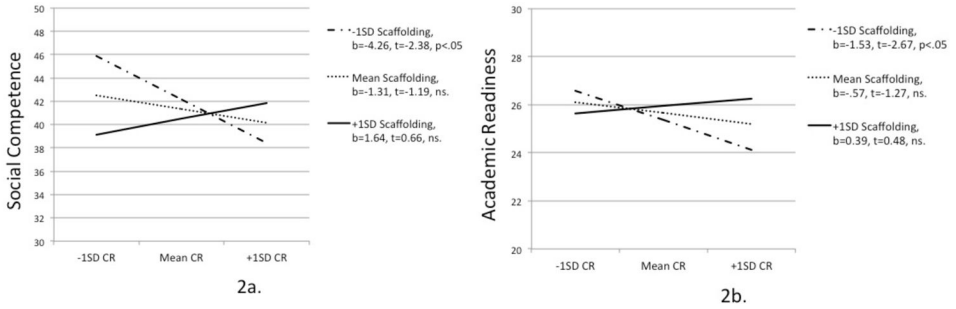

Figure 2.

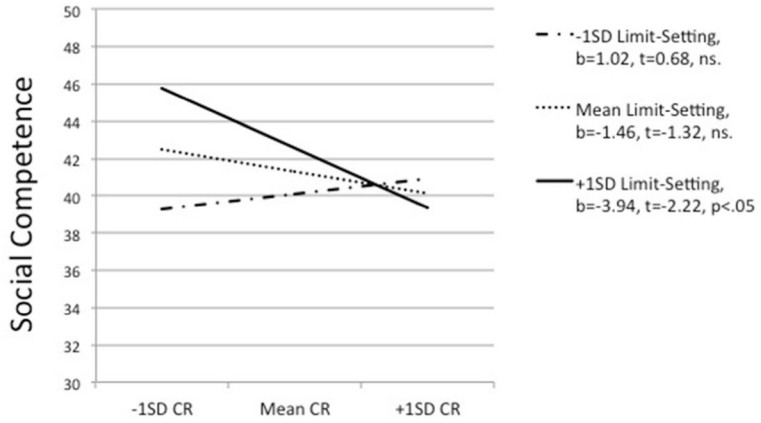

Figure 3.

Simple slopes for moderation effects of consistent limit-setting at mean and +/− 1 SD levels of cumulative risk on social competence.

Table 1

Descriptive statistics and correlations among study variables.

	M	SD	T1 Probs	T1 Soc	Inc	CR	Warm	Neg	Cons	Scaf	Resp	T2 Probs	T2 Soc	T2 Acad Readi
Child Gender	--	--	.02	−.13	−.05	−.01	−.02	.03	−.04	−.11	−.12*	.19*	−.20*	−.10
T1 Problems	11.56	6.29	--	−.49*	−.27*	.24*	−.17	.34*	−.23*	−.26*	−.03	.40*	−.29*	−.14
T1 Social Competence	37.38	8.73		--	.33*	−.21*	.25*	−.37*	.18	.32*	.18	−.34*	.36*	.35*
Family Income	8.75	3.93			--	−.59*	.23*	−.26*	.29*	.40*	.07	−.27*	.17	.22*
Cumulative Risk	0.90	0.81				--	−.13	.34*	−.22*	v.31*	−.12	.28*	−.23*	−.22*
Warmth	3.75	0.45					--	−.24*	.33*	.50*	.33*	−.16	.08	.20*
Negativity	0.36	0.38						--	−.25*	−.51*	−.36*	.23*	−.32*	−.23*
Consistent Limit-Setting	4.42	0.60							--	.42*	.17*	−.12	.13	.27*
Scaffolding	3.47	0.55								--	.35*	−.20*	.13	.25*
Responsiveness	4.40	0.74									--	−.08	.12	.15*
T2 Problems	9.05	7.06										--	−.72*	−.15
T2 Social Competence	43.07	10.15											--	.30*
T2 Academic Readiness	38.69	3.81												--

Gender is coded 1=female, 2=male

Table 2

Regression coefficients testing the direct and interactive effects of cumulative risk and parenting on children's adjustment problems, social competence and academic readiness

	Adjustment Problems			Social Competence			Academic Readiness		
	b	**SE**	**β**	**b**	**SE**	**β**	**b**	**SE**	**β**
Covariates									
T1 Adj. Problems	0.36	0.07	.34*	--		--	0.12	0.07	.20
T1 Social Competence	--		--	0.39	0.08	.36*	0.17	0.05	.39*
Child gender	1.82	0.86	.13*	−2.80	1.23	−.14*	−0.27	0.51	−.04
Family Income	−0.12	0.15	−.07	−0.26	0.21	−.10	0.02	0.09	.02
Main Effects									
Cumulative Risk	1.42	0.80	.17	−1.46	1.11	−.12	−0.57	0.45	−.12
Warmth	−0.71	1.30	−.04	−1.28	1.81	−.06	−0.04	0.74	−.01
Negativity	0.81	1.66	.04	−3.81	2.40	−.14	−0.23	1.00	−.02
Consistent Limits	−0.45	0.89	−.04	2.04	1.24	.12[t]	1.14	0.52	.18*
Scaffolding	0.38	1.18	.03	−1.51	1.62	−.08	0.54	0.65	.08
Responsiveness	0.15	0.74	.02	−1.09	1.04	−.08	−0.16	0.43	−.03
Interaction Effects									
Cumulative Risk									
X Warmth	3.92	2.00	.20*	−9.72	2.84	−.35*	−2.60	1.14	−.24*
X Negativity	−0.94	2.53	−.07	−3.47	3.43	−.17	0.80	1.41	.10
X Consistent Limits	2.47	1.44	.19[t]	−4.41	2.03	−.22*	0.63	0.85	.09
X Scaffolding	−2.22	1.82	−.15	5.73	2.51	.28*	1.86	0.95	.22*
X Responsiveness	−0.75	1.30	−.06	0.45	1.90	.03	−0.03	0.76	−.00
Model R^2	**R^2**	**SE**	**t-test**	**R^2**	**SE**	**t-test**	**R^2**	**SE**	**t-test**
	.29*	.06	5.40	.23*	.05	4.95	.31*	.07	4.28