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Research Findings: This study examined relations between contextual risk, maternal negative emotionality, and preschool teacher reports of the negative emotion dysregulation of children from economically disadvantaged families. Contextual risk was represented by cumulative indexes of family and neighborhood adversity. The results showed a direct pathway linking family adversity to child negative emotion dysregulation and indirect pathways for both family and neighborhood adversity through maternal negative emotionality. *Practice or Policy:* The results suggest the importance of conceptualizing distal and contextual aspects of the ecology of disadvantage as well as more proximal caregiving variables in interventions targeted for young children showing negative emotion dysregulation.

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Economic disadvantage relates to difficulty with emotion regulation in preschool (Raver, Garner, & Smith-Donald, 2007; Raver et al., 2009). The difficulty poses risks for elementary school adjustment. Preschool negative emotionality relates to angry and aggressive behaviors in elementary school

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(Gilliom, Shaw, Beck, Schonberg, & Lukon, 2002; Hill, Degnan, Calkins, & Keane, 2006; Shaw, Gilliom, Ingoldsby, & Nagin, 2003), and flexible management of emotionality in preschool matters for positive learning and social behaviors (Graziano, Reavis, Keane, & Calkins, 2007; Trentacosta & Izard, 2007). Moreover, emotion regulation skills may hold particular importance for economically disadvantaged children, who commonly face academic and other school problems that stimulate frustration and negative emotionality (Duncan & Brooks-Gunn, 1997, 2000; Entwisle, Alexander, & Olson, 2004).

Proximal sources of emotion regulation difficulties for economically disadvantaged children are well established. Child variables include bioregulatory processes (Bandon, Calkins, Keane, & O'Brien, 2008; Calkins, 2009), temperament (Eisenberg et al., 2003; Valiente et al., 2003), attention (Blair & Razza, 2007; Carlson & Wang, 2007), and emotion knowledge (Fine, Izard, Mostow, Trentacosta, & Ackerman, 2003; Raver et al., 2007); caregiving variables include maternal negative emotionality (Bandon et al., 2008; Feng et al., 2008) and warm and positive parenting behaviors (Eisenberg et al., 2005; Grolnick, McMenemy, & Kurowski, 2006). The present study examined more distal and contextual variables, such as family and neighborhood indexes of poverty risk, in relation to maternal negative emotionality and child emotion regulation in preschool. Although many studies of emotion regulation rely on income to account for poverty risk, Duncan and Brooks-Gunn (1997, 2000) argued that income poverty in early childhood relates primarily to cognitive ability, whereas contextual correlates explain behavioral adjustment. Accounting for contextual risk may add to the understanding and prediction of emotion regulation difficulties for economically disadvantaged children and promote understanding of distal constraints that limit the effectiveness of interventions focusing on proximal sources of child emotion regulation.

For economically disadvantaged children, family adversity represents a salient source of contextual risk (Ackerman, Brown, Schoff D'Eramo, & Izard, 2002; Ackerman, Kogos, Youngstrom, Schoff, & Izard, 1999; Adam, 2004). Family adversity involves those contextual variables that destabilize and negatively impact family relationships, routines, and agendas. The variables include events that may disrupt family life for a limited period of time, such as a family member's acute medical issue or problem with the criminal justice system, as well as demographic factors that tend to have ongoing destabilizing and negative effects on family life, for example parental school dropout, which often relates to employment instability, and parental residential partner relationship dissolution, which often relates to family conflicts and disruptions in children's relationships with attachment figures (Ackerman et al., 1999, 2002).

Like other contextual aspects of poverty, family adversity factors often covary and interrelate for economically disadvantaged families and are usefully represented by a cumulative risk index. Cumulative indexes reflect the number of adverse events or extent of adversity a child might experience and are motivated theoretically by arguments that family stressors penetrate all aspects of family functioning and that children experience the family environment as a whole rather than one factor at a time (Ackerman, Brown, & Izard, 2004). Contextual stressors are especially likely to cumulate for economically disadvantaged families, and it is the cumulative load that seems to undermine children's self-regulation and emotional development (Evans & Kim, 2007).

Family adversity may influence child emotional functioning both directly and indirectly (Ackerman et al., 2002). Consider the direct effects of changes in a residential partner. Partner separation not only exposes a child directly to partner conflict but also directly disrupts relations with a parent figure. From the perspective of emotional security theory (Davies & Woitach, 2008), these factors may sensitize the child to conflict and stress and impair the young child's emerging ability to regulate anger and other negative emotions. Similarly, adult substance abuse or police involvement may relate to direct effects by influencing the emotional climate of family life, threatening the predictable and consistent roles filled by the adult in family practices and relationships and exposing the child to negative models. Though few studies focus on family adversity, related evidence suggests that the cumulative load of these kinds of variables imposes a direct tax on children's physiological stress response systems (Evans & English, 2002).

The indirect effects may be powerful as well, primarily through a pathway representing maternal emotional functioning (Blandon et al., 2008; Feng et al., 2008). Maternal depressive symptomatology, for instance, may both reflect these aspects of contextual family adversity and leak into relationships with children. Negative emotionality and emotional lability of the primary caregiver also may impair the young child's ability to regulate emotion and respond in an age-appropriate way to daily frustration and stressors.

For impoverished families, a further level of contextual adversity concerns neighborhood variables, such as physical conditions, safety, and community facilities (e.g., playgrounds, libraries, community centers). Perceived neighborhood adversity reflects and affects family and caregiver variables and plays a role in establishing a context for child emotional development. It is not known whether neighborhood adversity relates to child functioning independent of family adversity. Several studies suggest, however, that any independent relations to the emotional and behavioral adjustment of preschool children are likely to be indirect rather than direct and mediated

through maternal functioning (Kohen, Brooks-Gunn, Leventhal, & Hertzman, 2002; Kohen, Leventhal, Dahinten, & McIntosh, 2008). The main reason to posit indirect effects is that preschool children may have relatively few direct experiences with elements of neighborhood adversity independent of a caregiver. Moreover, neighborhood adversity reflects the perceptions of the caregiver and may exert its greatest influence on young children via the toll of perceived neighborhood stress on maternal emotional well-being. 115

A final issue concerns components of emotion regulation and specificity in relation to these aspects of contextual risk. Based on the Shields and Cicchetti (1997) framework, recent accounts have distinguished between negative emotion dysregulation, which involves problematic expressions of negative emotions (e.g., reactivity, intensity, and lability), and positive emotion regulation, which includes processes (e.g., emotion understanding) that manage those expressions (Bandon et al., 2008). The reactive, intense, and labile expressions are problematic in that they may thwart functional progress toward a child's behavioral goals (Cole, Hall, & Radzioch, 2009). Some evidence suggests specificity in relations, such that maternal warmth and positive behaviors relate to developments in managing emotion expressions, and maternal negative emotionality and depressive symptomatology (i.e., proximal risk) relate to dysregulation of negative emotions (Eisenberg et al., 2005; Feng et al., 2008). This specific relation for proximal risk suggests that more distal, contextual risk might also relate specifically to negative emotion dysregulation. 120 125 130

The present study examined the relations between contextual risk, maternal negative emotionality, and preschool teacher reports of emotion regulation by 3- and 4-year-old children from economically disadvantaged families. Contextual risk concerned family and neighborhood adversity. We sampled children from Head Start preschool programs because low family income represents risk for academic and social adjustment problems at school entry and because restricting the sample to economically disadvantaged families enabled us to separate effects for family income and contextual correlates. Collinearity for income and contextual risk factors is more of a problem for economically heterogeneous samples of families. 135 140

Arguments for specificity with regard to income, aspects of contextual risk, and components of emotion regulation motivated our hypotheses. First, we expected that the cumulative indexes of both family and neighborhood adversity would relate significantly and independently to teacher reports of child negative emotion dysregulation. We expected weak relations with the positive management aspect of emotion regulation. Second, we expected that maternal negative emotionality would explain relations for neighborhood adversity and hence that the effect for neighborhood adversity would be indirect. We expected both a direct path and an indirect 145 150

path for family adversity, with the indirect path through maternal negative emotionality. We expected that these relations would stand up in the context of controls for child age and verbal ability and for family income. Indeed, we expected that any relations between family income and child emotion regulation would be weak in the context of verbal ability and of the cumulative indexes of family and neighborhood adversity.

METHOD

Participants

The participants were 113 children enrolled in an urban Head Start preschool as well as their mothers and teachers. The Head Start included families living in a range of neighborhood conditions in the surrounding area, with approximately 30% living in a subsidized housing project across the street from the preschool. The preschool operated from 8:30 a.m. to 2:45 p.m., 5 days a week, 40 weeks a year. Preschool classes were grouped according to age, with an average of 17 children per class, and 1 lead teacher and 1 assistant. Families were recruited at the time of preschool enrollment, and caregiver informed consent and child assent were obtained at this time. Approximately 87% of families elected to participate. Those not included in the present study either could not be scheduled for in-person interviews or did not show at their scheduled time. The mean age of the participating children was 4 years, 1 month ($SD = 7.24$ months, range = 26 months); 47% were female and 80% were African American. Approximately 30% of the families were low income (i.e., income-to-needs ratios <2 times the federal poverty threshold) and 60% were poor (i.e., income-to-needs ratios <1 times the federal poverty threshold).

Procedure

Ethical standards were followed in the conduct of this study, and all procedures were approved by the appropriate institutional review boards. Mothers completed demographic questionnaires about their families and reports about themselves in September and October of the preschool year. The mothers' interviews took place in a conference room in the Head Start preschool, with trained research assistants aiding in the completion of questionnaires when necessary. During the same timeframe, children completed assessments of verbal ability that were conducted by trained research assistants in a conference room in the Head Start preschool. Teachers reported about child emotion regulation in October and November.

Measures

Family adversity. The measure of family adversity was a cumulative index representing answers to five questions about family contextual risks on the demographic questionnaire. The questions concerned (a) high school dropout of the primary caregiver (19% of families), (b) change in an intimate residential partner since the child's birth (51%), (c) serious medical problems for a family member in the past year (46%), (d) substance abuse by a family member in the past year (10%), and (e) problems with the criminal justice system for a family member in the past year (15%). We chose these variables because they reflect structural factors that destabilize and negatively impact family functioning. High school dropout, for example, is a proxy for employment instability, and change in a residential partner (e.g., divorce) often starts or reflects a series of relationship transitions for mothers in low-income families. Mothers answered "yes" or "no" for each question, and we constructed a cumulative adversity index by totaling the number of affirmative responses. Scores ranged from 0 to 4, and the mean was 1.41 ($SD = 1.15$).

Neighborhood adversity. This measure was a cumulative index representing mothers' answers to three questions about the characteristics of their residential neighborhood, answered "yes" or "no." The questions addressed (a) inadequate neighborhood physical condition (18% of families); (b) inadequate neighborhood safety (32%); and (c) inadequate neighborhood facilities, such as playgrounds, libraries, and community centers (20%). The cumulative neighborhood index reflected the number of "yes" answers. Scores ranged from 0 to 3, and the mean was 0.70 ($SD = 1.10$).

Family income. On the demographic questionnaire, mothers estimated family income from all sources, including employment, child support, disability, and so on, and reported the number of residential family members (children and adults). We computed an income-to-needs ratio by dividing the per capita income of each family by the federal standard for the poverty line. A ratio of 1.0 represented the poverty line, and 2.0 represented economic disadvantage. Income-to-needs ratios ranged from 0 to 2.81 ($M = 0.71$, $SD = .71$), and 90% of the families had ratios below 2.0.

Maternal negative emotionality. The measure of maternal negative emotionality was a mixed list of items from the State-Trait Anger Scale (STAS; Spielberger, Jacobs, Russell, & Crane, 1983), the State-Trait Anxiety Inventory (STAI; Spielberger, Gorsuch, Lushene, Vagg, & Jacobs, 1983), and the Center for Epidemiologic Studies–Depression scale (CES-D;

Radloff, 1977). The measure was the same as one used by the NICHD Study of Early Child Care (National Institute of Child Health and Human Development Early Child Care Research Network, 1994).

The CES-D is a widely used and validated measure of depressive symptomatology for use with nonclinical samples. We used an adapted “My Feelings” scale, which contained 20 items scored on a 4-point Likert scale of frequency from 1 to 4, with higher scores reflecting more depressed feelings during the past week. Cronbach’s alpha was .86. Scores ranged from 20 to 63, and the mean was 34.43 ($SD = 9.09$). We also adapted 10 items each from the STAS and STAI that asked parents to rate their feelings of anger and anxiety, respectively, over the past week on a 4-point scale (1 = *not at all*, 4 = *very much*). Higher scores reflected more anger and anxiety. The respective means were 17.00 ($SD = 6.83$, range = 10–27) and 17.84 ($SD = 5.80$, range = 10–23). The 10-item subscales correlated .77, and Cronbach’s alpha for the combined items was .93. This combined scale correlated .73 with the scale from the CES-D, and Cronbach’s alpha for the overall measure was .96, with scores ranging from 41 to 122 ($M = 69.27$, $SD = 19.44$). The CES-D, STAS, and STAI measures tap feelings over the past week and are used to indicate short-term symptoms and long-term risk of manifesting, respectively, depression, anger, and anxiety under stressful circumstances. Test–retest reliability for the CES-D ranges from .51 to .67 across 2- to 8-week intervals (Radloff, 1977), and test–retest reliability for the STAS and STAI ranges from .54 to .86 (Spielberger, Gorsuch et al., 1983; Spielberger, Jacobs et al., 1983).

Child emotion regulation. This measure was based on teacher reports on the Emotion Regulation Checklist (Shields & Cicchetti, 1997). The checklist has 23 items rated on a 4-point Likert scale indicating how frequently the behaviors occur (1 = *almost always* to 4 = *never*). The Positive Emotion Regulation subscale has 8 items assessing aspects of emotion understanding and empathy. Sample items are “is empathetic towards others” and “shows concern when others are upset or distressed.” Cronbach’s alpha was .71. Scores ranged from 9 to 45, and the mean was 20.51 ($SD = 5.22$). The Negative Emotion Dysregulation subscale includes 16 items focusing on emotional lability, anger reactivity, and negative emotion intensity. Sample items are “exhibits wide mood swings,” “is easily frustrated,” and “responds angrily to limit setting by adults.” Cronbach’s alpha was .83. Scores ranged from 5 to 46, and the mean was 25.33 ($SD = 7.67$). The correlation of the two scales was .39.

Child verbal ability. This measure was the Peabody Picture Vocabulary Test–III (Dunn & Dunn, 1997). This test is a well-validated measure with

TABLE 1
Correlations Among the Independent Variables and Positive Emotion Regulation (Pos) and Negative Emotion Dysregulation (Neg; $N = 113$)

<i>Variable</i>	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>	<i>6</i>	<i>7</i>	<i>Pos</i>	<i>Neg</i>
1. Sex ^a	—							.17	.12
2. Child age	-.03	—						.00	.03
3. Verbal ability	-.14	-.08	—					-.10	-.20*
4. Income-to-needs ratio	-.05	.12	.12	—				-.01	-.10
5. Family adversity	.01	.01	-.05	.01	—			.07	.33**
6. Neighborhood adversity	.13	-.11	-.11	-.25**	.10	—		.19*	.31**
7. Maternal negative emotionality	.11	.13	-.04	-.15	.38**	.40**	—	.07	.40**

^a0 = female, 1 = male.

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

test-retest reliability of .89. Scores ranged from 48 to 117, and the mean was 83.10 ($SD = 13.21$).

RESULTS

Table 1 shows the zero-order correlations between the independent variables and the teacher reports of positive emotion regulation and negative emotion dysregulation. The most noteworthy findings are, first, that family income-to-needs ratios did not relate to the child emotion scores. Second, in contrast, both of the cumulative adversity indexes correlated significantly with child negative emotion dysregulation, although they correlated weakly with each other. Third, these indexes correlated significantly with parent negative emotionality, which also correlated with child negative emotion dysregulation. These correlations establish the functional independence and specificity of income and indexes representing contextual risk in predicting child negative emotion dysregulation.

Negative Emotion Dysregulation

A hierarchical regression isolated unique predictors of child negative emotion dysregulation. We entered child age, verbal ability, and family income-to-needs ratio first as control variables. To preserve power, we did not enter the sex of the child, as this variable did not relate significantly to any other variables. Next we entered the cumulative risk indexes. We

TABLE 2
Summary of Effects in the Regression for Negative Emotion Dysregulation ($N=113$)

Variable	Model 1		Model 2		Model 3	
	β	sR^2	β	sR^2	β	sR^2
Age	.02	.00	.06	.00	.01	.00
Verbal ability	-.19	.04*	-.15	.03	-.16	.03
Income-to-needs ratio	-.08	.01	-.03	.00	.00	.00
Family adversity			.30	.08**	.22	.04*
Neighborhood adversity			.26	.06**	.17	.02
Maternal negative emotionality					.24	.04*

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

entered parent negative emotionality last to provide evidence about direct versus indirect effects.

Table 2 shows a summary of the effects. The overall model (Model 3) was significant, $F(6, 106) = 6.01$, $R^2 = .25$, $p < .01$. In Model 2, the cumulative risk block was associated with a significant change in R^2 of .17, and both family and neighborhood adversity were associated with significant unique effects ($sR^2 = .08$ and $.06$, respectively). The final model (Model 3) showed unique direct effects for family adversity and parent negative emotionality. Sobel tests showed significant indirect pathways through parent negative emotionality linking both family and neighborhood adversity to child emotion dysregulation (respective scores = 2.92 and 3.30).

Positive Emotion Regulation

A similar hierarchical regression predicting positive emotion regulation was not significant overall, $F(6, 106) = 1.34$, and did not show any significant unique effects.

DISCUSSION

Emotion regulation among preschoolers is a good predictor of academic achievement and behavioral adjustment in the early elementary grades (Graziano et al., 2007; Raver et al., 2007; Shaw et al., 2003). Substantial evidence ties negative emotion dysregulation to proximal maternal variables, such as emotional difficulties (Blandon et al., 2008; Feng et al., 2008) and parenting practices (Eisenberg et al., 2005), and to family impoverishment (Raver et al., 2009). Family income per se, however, often relates more powerfully to young children's verbal and cognitive deficits than to

behavioral adjustment (Ackerman et al., 2004; Duncan & Brooks-Gunn, 1997, 2000), making it unclear which aspects of the ecology of disadvantage relate specifically to preschoolers' negative emotion dysregulation and which mechanisms might account for the effects. This study helps to address these issues.

One important finding is that maternal negative emotionality predicted teacher reports of the negative emotion dysregulation of 3- and 4-year-old preschoolers. This finding is consistent with the results of other studies (Blandon et al., 2008; Feng et al., 2008) and is evidence that children's dysregulated expressions of negative emotions (e.g., reactivity, intensity, and lability) may be conditioned by proximal variables focusing on maternal negative emotionality. Maternal negative emotionality, however, did not relate to children's positive emotion regulation. This finding too is consistent with reports showing specificity in relating child positive emotion regulation to maternal warmth and positive parenting behaviors (Eisenberg et al., 2005; Grolnick et al., 2006), which we did not examine.

Our novel findings concern the relations between more distal and contextual aspects of the ecology of economic disadvantage and preschoolers' negative emotion dysregulation. First, cumulative representations of family and neighborhood adversity related significantly to child emotion dysregulation both at a zero-order level and in the regression block representing contextual risk. This suggests the importance of moving beyond proximal variables like maternal negative emotionality in accounting for child negative emotion dysregulation. Second, pathways to child emotion dysregulation differed for family and neighborhood adversity. The results showed that family adversity related both directly and indirectly through maternal negative emotionality, whereas the effects for neighborhood adversity were only indirect. We predicted the effects for family adversity on both theoretical and empirical grounds. Theoretically speaking, family adversity represents contextual variables that disrupt relations among family members and disrupt family routines and agendas, including changes in a mother's residential partner and aspects of parental maladjustment. Given these family-level effects, such adversity is likely to affect a child both directly through disrupted relations and routines and indirectly through maternal affect, mood, and parenting practices. Empirical support comes from findings of other studies of both direct relations between representations of family adversity and child problem behaviors in elementary school and indirect relations through proximal caregiving variables (Ackerman et al., 1999, 2002). In contrast, we predicted only indirect pathways for neighborhood adversity on the argument that young children's experience of the neighborhood primarily reflects maternal daily hassles, feelings (e.g., fear, anger), and expressions. Considerable evidence supports this idea (Kohen et al., 2008; Leventhal & Brooks-Gunn, 2000).

Third, in contrast to the findings for contextual risk, family income-to-needs ratios did not relate to child negative emotion dysregulation, even at a zero-order level. This finding is consistent with the specificity hypothesis that income poverty and poverty cofactors (i.e., contextual correlates) relate differently to child socioemotional adjustment and cognitive ability (Ackerman et al., 2004; Duncan & Brooks-Gunn, 1997, 2000). This finding suggests the importance of representing and isolating effects for environmental correlates of income poverty for disadvantaged children. For young children at least, family income often may be a proxy for other variables in explaining relations between environmental adversity and children's behavioral problems and development.

We note several limitations in interpreting our results. First, evidence for a direct pathway for family adversity may rest on the choice of maternal negative emotionality as the proximal variable in the model. We chose maternal negative emotionality because of its centrality in the proximal processes related to children's emotion dysregulation. We also have evidence from other work that direct effects of cumulative representations of contextual risk for disadvantaged families survive representations of harsh parenting (Ackerman et al., 2002). Nonetheless, the results could differ with the inclusion of other parenting behaviors that encourage child affect regulation and contribute to the socialization of emotional arousal and displays.

Second, we chose to represent aspects of contextual adversity with cumulative risk indexes. The theoretical motivation was that family stressors penetrate all aspects of family functioning, that stress cumulates, and that children experience families as a whole. The empirical motivation was that single variables rarely explain robust amounts of variance in child outcomes and that collinearity among single variables in additive models for a disadvantaged sample would limit examination of direct or indirect effects. The limitation concerns the possibility that a different selection of risk indicators in each index might yield somewhat different results. For family adversity, our confidence in the variables in the cumulative index is based on relations to young children's behavioral adjustment in other studies (Ackerman et al., 1999, 2002; Trentacosta et al., 2008). Note also that the contributions of variables to experiences of family and neighborhood adversity may differ for older children and adolescents (Adam, 2004).

Third, the restriction of the sample to economically disadvantaged families and to mostly African American families limits the generalizability of the results and conclusions. The advantage of the restriction is that it enables a focus on diversity within a disadvantaged sample and thus minimizes problems of collinearity among income and contextual variables and problems of reporter and measurement bias.

Fourth, we did not describe a robust developmental model of relations 395
 between contextual risk and emergent aspects of emotion regulation.
 Mothers reported on contextual risk and negative emotionality at a single
 point in time, and only a brief interval separated their report from teachers'
 ratings of child emotion regulation difficulties in preschool. Thus, we cannot
 make claims about the causal sequence linking these variables, nor can we 400
 estimate the importance of such relations in early childhood for later behav-
 ioral adjustment. Other evidence with disadvantaged samples of older
 children, however, indicates that, in contrast to early childhood income pov-
 erty, which leaves an enduring imprint on children's verbal ability, the
 effects of contextual variables on behavioral adjustment in school are mostly 405
 concurrent. The likelihood of concurrent effects suggests the importance of
 conceptualizing contextual risk in interventions targeted for children show-
 ing negative emotion dysregulation.

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