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ORIGINAL PAPER

Maternal Depression and Children's Cognitive and Socio-Emotional Development at First Grade: The Moderating Role of Classroom Emotional Climate

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Abstract This study examined whether a warm and positive classroom emotional climate would buffer the detrimental effects of maternal depression on children's cognitive and socioemotional adjustment at first grade. Based on 1364 dyads, four waves of data spanning 6 months to first grade were used to examine paths between mothers' early cumulative depressive symptoms and five first-grade outcomes (internalizing and externalizing behavior problems, social competence, academic functioning, and relationship with teachers). Classroom emotional climate was observed at first grade. Multiple group modeling revealed that children who were placed in a classroom that was characterized by a warm and positive emotional climate were shown to be less severely, or not, affected by mothers' depressive symptoms in terms of the development of externalizing problems, social skills, cognitive performance, and relational functioning. Guided by the bioecological perspective, the current study showed synergic effects of intra-familial and extra-familial elements on an array of children's developmental outcomes over time.

Keywords Maternal depression · Classroom emotional climate · Cognitive functioning · Socioemotional adjustment · First-grade

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Introduction

Maternal depression has long been documented as having negative implications for children's development, and this is especially true during the transition to elementary school (Cummings and Davis 1994). For example, during this transitional period, children of mothers with greater depressive symptoms (versus mothers with fewer depressive symptoms) have been found to perform more poorly in terms of academic achievement, exhibit more internalizing and externalizing problems, and experience more difficulties in their social interactions with their peers (Campbell et al. 2007; Greenberg et al. 1999). According to Bronfenbrenner's (2001) bioecological theory, this transition involves the shifting of contexts and opportunities, which allows for new interactions that foster the proximal processes that drive children's growth and development. Positive experiences in high-quality classrooms may serve as one such opportunity, whereby frequent interactions with teachers that are warm and supportive in nature may provide valuable opportunities for children at risk to develop and cope with the adversity associated with maternal depression. This hypothesis, however, has not been empirically tested.

Across the US, approximately 10 % of mothers experience depression each year (Ertel et al. 2011), which can undermine the home environment and exert large, enduring, and pervasive impacts on children's functioning and adjustment (Goodman and Gotlib 1999). Consider the extant literature which reveals that children of depressed mothers are more likely to have insecure attachment, poor emotional regulation, poor cognitive and language functioning, elevated rates of academic failure, heightened levels of internalizing and externalizing problems, and less optimal social competence and peer relationships

(Cicchetti et al. 1998; Cummings and Davis 1994; Zahn-Waxler et al. 1990).

Children's experiences within classrooms constitute another important proximal context that can have implications for various aspects of their short- and long-term development. When children begin formal schooling, they begin to spend more time in the classroom and, thus, social interactions outside of the family contribute to developmental variability. The classroom emotional climate represents one of the key features of a supportive classroom environment. Specifically, the classroom emotional climate refers to the global classroom atmosphere and the degree to which the classroom as a whole functions smoothly and harmoniously (Wilson et al. 2007). A positive classroom emotional climate is characterized by teachers' responsiveness to children's emotional needs, a warm and positive atmosphere, and an absence of negativity and conflict. In classrooms characterized by a positive emotional climate, teachers: (a) are aware of each individual child's needs, interest, and capabilities; (b) are actively and emotionally involved in children's activities; (c) consistently demonstrate positive regard and warmth in interactions with children; and (d) show absence of negative affect and conflicts. Establishing a warm relationship with children within classrooms is one effective mechanism that can foster children's motivation and compliance and internalization of discipline (Kochanska 2002), which, in turn, may deter children from engaging in risk behaviors and foster social competence. Additionally, exposure to a positive and responsive classroom environment may facilitate children's development of emotion regulation and social skills (Howes 2000; Pianta et al. 2002; Skinner et al. 1998) that are the underpinning for their resilience in the presence of an adverse home environment.

Beyond the direct impact of each individual microsystem, bioecological and developmental theory highlights the interplay between contexts (Bronfenbrenner and Morris 2006). In other words, the home and school systems–both independently and synergistically—shape various aspects of children's development (Bronfenbrenner and Ceci 1994). Consistent with this proposition, a central tenet of the arena of comfort theory is that different developmental contexts can provide compensation and/or protection for children to recover and renew from stressors in another context (Call and Mortimer 2001). In addition, transactional theory of risk and adaptation (Rutter 2007) and protective models of resilience (Fergus and Zimmerman 2005) also underscore the importance of the interactions between risk and protective factors in shaping children's development. In support of these theoretical propositions, the extant literature has consistently documented a large effect of schools, such that attending a high-quality child care program or elementary school could foster optimal development across multiple domains for children from high risk families (Hagekull and Bohlin 1995; NICHD ECCRN 2003; Noam et al. 2001; Pianta et al. 2002; Rimm-Kaufman et al. 2002).

To date, limited empirical attempts have been made to understand whether a positive classroom emotional climate in elementary school can buffer against earlier risk factors. A few studies are of note, however. First, Kiuru and colleagues (2012) found that a supportive classroom climate at first grade protected children who were at risk for reading disabilities and problem behavior from peer rejection. Hamre and Pianta (2005) also found that emotional and instructional support during first grade buffered children from maladaptive adjustment as a result of familial risk. Relatedly, several researchers have focused on the protective effects of a positive classroom climate among particular groups of children who demonstrate risk behavior. For example, Gazelle and colleagues (Avant et al. 2011; Gazelle 2006) have conducted several studies on anxious and lonely children and found that a positive classroom emotional climate protected children from peer rejection during middle and late childhood. Downer et al. (2007) extended this line of research by demonstrating the protective effect of a positive classroom emotional climate against aggressive children's risk for school failure. Taken together, a positive classroom climate can serve as a valuable source of compensation for children at risk.

Despite this evidence, there are a few notable gaps in the extant literature. First, most studies have focused on children's academic achievement or peer rejection, but less is known about how the classroom climate might buffer children from the risks associated with behavioral adjustment. No studies, to our knowledge, have examined the development of social competence of these at-risk children due to mothers' depressive symptoms. The acquisition of social competence in the context of maternal depression is of paramount importance because it may set in motion a trajectory of positive development beyond the decrease of problem behavior, academic failure, and/or peer exclusion (Lansford et al. 2006). Second, although previous research has found that school-based supportive ties can buffer children against potentially negative conditions in the home environment (Dubois et al. 1992), we have found no studies that explicitly examined how the school context buffers the negative impacts of maternal depression specifically. This is of great importance as children who have experienced familial risk, such as maternal depression, appear to need more support in extra-familial contexts (Reid et al. 1989). Understanding the ameliorating effects of positive classroom emotional climate against pathogenic effects of maternal depression on child development would provide critical insight for future prevention and intervention efforts.

In sum, the present study seeks to examine whether a positive classroom emotional climate would buffer the

negative impact of mothers' depressive symptoms on children's cognitive and socio-emotional adjustment at first grade. Pulling from the extant literature, we hypothesized that children who attended a classroom characterized by a positive emotional climate would be less affected by their mothers' depressive symptoms.

Method

Participants

Data for this study were derived from the National Institute of Child Health and Human Development Study of Early Child Care and Youth Development (NICHD SECCYD), a longitudinal study of 1364 families from 10 sites across the US. Based on conditional-random sampling, families were recruited in 1991 upon the birth of their child. Fifty-two percent of children were female, 24 % were of an ethnic minority background, 10 % of children had mothers who had less than high school education, and 14 % of children were born to single mother households.

Procedure

This report is based on data that were collected when children were 1 month of age through the end of the first grade year. Reports of mothers' depressive symptoms were collected at 5 time points across this period. Assessments of children's adjustment were collected when children were at first grade and the classroom emotional climate was observed both at the spring and fall semesters of the school year. To reduce the possibility of spurious associations, several theoretically relevant demographic characteristics were included in all models, namely: ethnic minority status, child gender, maternal education (in years, at 1 month), family income-to-needs ratio, marital status, and the presence of the father in the home at 6-months (Goodman and Gotlib 1999).

Measures

Mothers' Depressive Symptoms

Mothers' depressive symptoms were assessed when children were 6, 15, 24, 36, and 54 months of age using the Center for Epidemiological Studies Depression Scale (CES-D; Radloff 1977). The CES-D is a widely used tool to assess depressive symptoms in non-clinical samples. During each home visit, mothers rated the frequency of 20 symptoms over the past week on a 4-point Likert scale (1 = *rarely/none of the time* to 4 = *most or all of the time*). This measure has demonstrated strong internal validity as well as high reliability across each assessment (α's = .88–.91). Considering that relatively brief exposure to mothers' depressive symptoms does not always result in less optimal child adjustment (e.g., Campbell et al. 1995), in this study, we measured children's exposure to mothers' depressive symptoms over four and half years. To do so, we averaged mothers' score on the CES-D from the 6-, 15-, 24-, 36-, and 54-month assessments.

Internalizing and Externalizing Problems

Children's internalizing problems were assessed at the end of first grade using parental report of the Child Behavior Checklist (CBCL/4-18) and teachers' report of the Teacher Report Form (TRF). The CBCL/4-18 is a comprehensive 99-item measure focused on children's behavioral and emotional problems during early childhood (Achenbach 1991). Mothers and fathers rated the extent to which their children display a variety of problem behaviors currently or over the last 2 months, respectively. The TRF is modeled after the CBCL/4-18 and was designed to obtain teachers' reports of children's adaptive functioning and behavior problems. A series of behaviors were rated on 3-point Likert scale ranging from 0 (*not true of the child*) to 2 (*very true of the child*). Both the CBCL and TRF measures yield scores of internalizing problems that include scores from subscales of withdrawal, anxiety/depression, and thought problems. Scores from the subscales of delinquency and aggressive behaviors yielded a composite score of externalizing problems. Mothers', fathers', and teachers' reports were used as manifest indicators of latent constructs of internalizing and externalizing problems. The subscales for internalizing (α's = .60–.74) and externalizing (α's = .52–.88) problems have demonstrated adequate reliability.

Social Competence

Fathers, mothers, and teachers rated children's social competence using the Social Skills Rating System (SSRS) at the end of the first grade year. This measure, which was based on a 3-point Likert scale (0 = *never*; 1 = *sometimes*; 3 = *often*), has demonstrated adequate to strong internal consistency across both teachers (α's = .84–.91) and parents (α's = .69–.88). Similar to children's behavior problems, we used mothers', fathers', and teachers' reports as manifest indicators of the latent construct of children's social competence.

Cognitive Functioning

Children's cognitive functioning at the end of first grade was assessed using the Woodcock-Johnson Psycho-educational Battery-Revised (Woodcock and Johnson 1989).

This battery included assessments of children's cognitive aptitude and achievement. In terms of cognitive aptitude, it included an assessment of long-term retrieval (Memory for Names), short-term memory (Memory for Sentence), auditory processing (Incomplete Words), and comprehension-knowledge (Picture Vocabulary). Finally, in terms of cognitive achievement, reading tests (Letter-Word Identification and Word Attack) and mathematics (Applied Problems) were included. For the purposes of this study, we created a composite of children's cognitive functioning using the T scores across the seven measures, which demonstrated strong reliability (.86).

Teacher-Child Relationship

Children's ability to establish a positive relationship with their teachers was assessed using 30 items from the Student–Teacher Relationship Scale (STRS; Pianta 1992), which has demonstrated strong reliability ($\alpha = .91$). Specifically, teacher reported on their perceptions of their relationship with the study child in terms of closeness and conflict. To tap into the teacher-child relationship, we computed a composite score based on the closeness and conflict (reversed) scores.

Classroom Emotional Climate

The classroom emotional climate was assessed using the classroom observation system (NICHD ECCRN 2002) at first grade. Classrooms were observed for approximately 3 hours during a morning-long period beginning at the start of the school day on a day the teacher identified as being focused on academic activities. Teacher's behaviors towards the target child and classroom quality were rated by trained observers. All the qualitative ratings were scored on a 7-point Likert scale ranging from 1 (*uncharacteristic*) to 7 (*extremely characteristic*). The total classroom emotional climate is composed of four classroom-level ratings (positive emotional climate, negative emotional climate, over-control, and effective classroom management) and three ratings of teachers' behavior towards the target child (sensitivity/responsiveness, intrusiveness/over-control, and detachment/disengagement). The inter-rater reliability (within one scale-point) was 81 %. Based on the total classroom emotional climate score, children were categorized into one of three groups. Children who were enrolled in classrooms that ranked in the top 33 % of the emotional climate score were categorized into positive emotional climate group, children in the bottom 33 % were categorized into the negative emotional climate group, and all other children were categorized into the moderate emotional climate group.

Analytic Plan

We first present descriptive statistics for all focal variables and, then, we provide the bivariate correlates to determine whether mothers' depressive symptoms, children's adjustment outcomes, and classroom emotional climate were related as hypothesized. Finally, we turn to our focal analyses, which were conducted within a structural equation modeling framework using the Mplus statistical software (version 6.1; Muthén and Muthén 1998–2011). Four fit indices, including the Chi square value, the root mean square error of approximation (RMSEA), the comparative fit index (CFI), and the standardized root mean square residual (SRMR), were used to evaluate the fit of the proposed model (Kline 2010). Then, the main effects of mothers' depressive symptoms on children's adjustment outcomes at first grade were examined by constraining all paths to be equivalent across the three groups of classroom emotional climate. To determine whether the associations between mothers' depressive symptoms and children's adjustment were attenuated by the classroom emotional climate, we freed the pathways between mothers' depressive symptoms and child adjustment. This pathway was estimated separately across groups to determine if the models without the equality constraints would fit the data better. All models were estimated separately for each adjustment outcome and controlled for data collection site, child gender, child ethnicity, maternal education, family income-to-needs ratio, marital status, and presence of the father in the home at 6 months. Finally, the full information maximum likelihood method was used to address missing data (Acock 2005).

Results

Table 1 displays the descriptive statistics and correlations among the focal variables. Consistent with our hypothesis, maternal depression from early to middle childhood was associated with more internalizing and externalizing problems, less optimal social skills, poorer cognitive performance, and less positive relationships with teachers at first grade. The only exception was that mothers' depressive symptoms were not significantly correlated with teachers' report of internalizing problems. Classroom emotional climate was also correlated with all of the teacher-reported child outcomes along with mothers' reports of children's externalizing problems. Additionally, all of the adjustment outcomes were correlated with each other in the hypothesized directions. In terms of reporter agreement, the correlations for mother-, father-, and teacher-reported externalizing problems were stronger than those for internalizing problems.

Table 1 Means, standard deviations, and correlations among the focal variables

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.
1. Mothers' depressive symptoms	–												
2. Classroom emotional climate	−.06	–											
3. Children's internalizing problems (mother)	.29**	−.05	–										
4. Children's internalizing problems (father)	.11**	−.00	.27**	–									
5. Children's internalizing problems (teacher)	.04	−.02	.15**	.12**	–								
6. Children's externalizing problems (mother)	.31**	−.10**	.58**	.20**	.08**	–							
7. Children's externalizing problems (father)	.18**	−.02	.24**	.63**	.06	.46**	–						
8. Children's externalizing problems (teacher)	.18**	−.08*	.07*	.11**	.30**	.34**	.29**	–					
9. Children's social competence (mother)	−.27**	.06	−.35**	−.16**	−.16**	−.41**	−.21**	−.22**	–				
10. Children's social competence (father)	−.10*	.01	−.18**	−.29**	−.08*	−.20**	−.28**	−.14**	.38**	–			
11. Children's social competence (teacher)	−.14**	.10**	−.12**	−.08*	−.40**	−.23**	−.17**	−.58**	.28**	.18**	–		
12. Children's cognitive performance	−.26**	.13**	−.03	.04	−.11**	−.13**	−.06	−.20**	.23**	.15**	.21**	–	
13. Child-teacher relationship	−.11**	.11**	−.13**	−.05	−.33**	−.25**	−.16**	−.55**	.25**	.17**	.66**	.17**	–
Mean	9.14	40.45	48.27	47.69	49.21	48.64	49.07	50.67	15.69	15.27	15.30	104.64	65.04
Standard deviation	6.42	6.63	8.94	9.19	9.18	9.79	9.30	8.72	2.70	2.53	3.61	10.56	8.16

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

We next examined whether mothers' cumulative depressive symptoms would predict children's adjustment outcomes at first grade. As an example, Fig. 1 illustrates the model for social competence (standardized parameter estimates are displayed). The fit indices and unstandardized parameter estimates are displayed in the upper portion of Table 2. The results from these analyses supported our hypotheses; holding constant a series of covariates, children whose mothers experienced more depressive symptoms displayed heightened levels of internalizing and externalizing problems and lower levels of social skills and cognitive functioning. Mothers' depressive symptoms, however, were not associated with children's relationship with their teachers. Inspection of model fit across the five outcomes revealed that not all of the models fit the data well when constraining all the pathways to be equivalent across groups of different classroom emotional climate (Kline 2010).

In order to examine whether the classroom emotional climate buffered the pathogenic effects of mothers' depressive symptoms on children's adjustment outcomes, the structural paths of interest were allowed to vary across groups with different emotional climate levels. Evidence for moderation would be provided if the multiple group models demonstrated a significant improvement in model fit as compared with the fully constrained model. To do so, the fully constrained models were gradually modified in two steps. First, we constrained all of the parameters to be equal across groups. Then, all of the estimated parameters, except for the measurement model, were allowed to vary across groups. It is important to note that when models are nested, more complex models will always fit the data as well as, or better than, the more parsimonious models. Thus, we used the Chi square difference test to determine whether the reduction in the Chi square value was significant, which would indicate evidence for moderation. Results of Chi square difference tests are displayed at the bottom of Table 2.

With regards to four of the five developmental outcomes, evidence in support of moderation emerged. Specifically, compared with the fully constrained models, the non-constrained models for externalizing problems, social competence, cognitive performance, and children's relationships with their teachers fit the data better. Fit indices of all of these four models met the recommended cutoff criteria (CFI > .95, SRMR < .08, and RMSEA < .06) except for the CFI for social competence and the RMSEA for relationship with teachers. Close scrutiny of the estimated parameters among the positive and negative classroom emotional climate groups suggested a consistent pattern such that positive classroom emotional climate buffered the negative impact of mothers' depressive symptoms on children's adjustment. As shown in Table 2, in classrooms

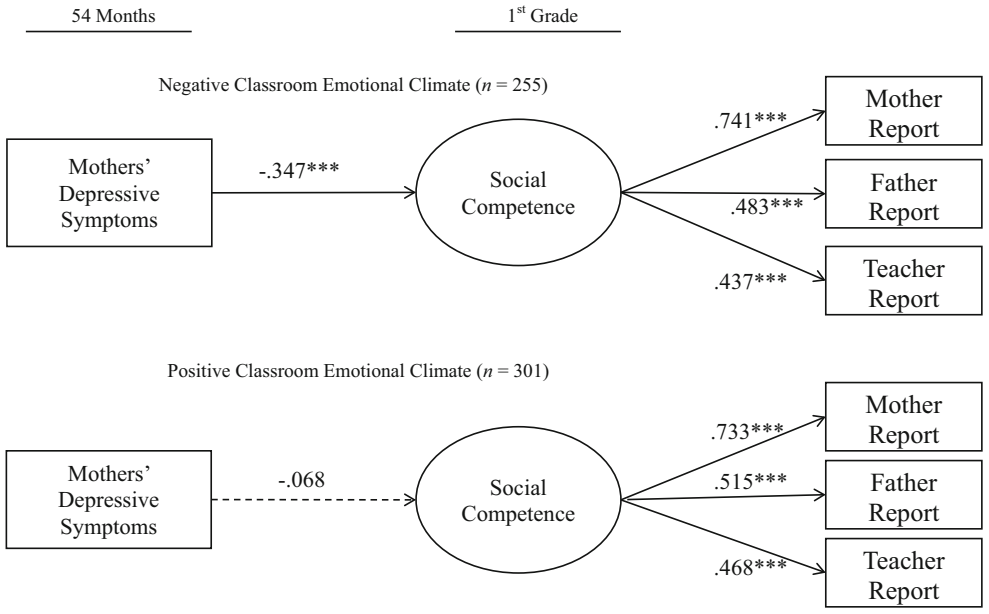

Fig. 1 The associations between mother's depressive symptoms and children's social competence across classrooms characterized by a positive and negative emotional climate ($n = 295$)

Table 2 Unstandardized results from structural equation models of mothers' depressive symptoms predicting children's adjustment and functioning

	Internalizing problems	Externalizing problems	Social competence	Cognitive performance	Child-teacher relationship
Main effects models					
Mothers' depressive symptoms	.171***	.183***	−.095***	−.972*	−.077
	(.049)	(.033)	(.016)	(.421)	(.048)
Model fit					
X^2	107.72*	124.07**	107.009*	33.68*	30.590*
	($df = 80$)	($df = 80$)	($df = 80$)	($df = 18$)	($df = 18$)
CFI	.825	.883	.904	.911	.767
RMSEA	.036	.045	.035	.058	.051
SRMR	.046	.049	.058	.107	.040
Moderating models					
Mothers' depressive symptoms					
Group: Neg.	.160**	.173***	−.103***	−1.817**	−.113
	(.057)	(.051)	(.023)	(.648)	(.085)
Group: Pos.	.214**	.165**	−.023	.582	.016
	(.062)	(.052)	(.027)	(.730)	(.080)
Model fit					
X^2	84.939*	78.148†	96.334†	2.350	4.265
	($df = 62$)	($df = 62$)	($df = 78$)	($df = 2$)	($df = 2$)
ΔX^2 *test*	*n.s.*	$p < .001$	$p < .001$	$p < .05$	$p < .05$
CFI	.855	.957	.935	.998	.958
RMSEA	.037	.031	.030	.026	.065
SRMR	.042	.038	.046	.006	.009

Unstandardized parameter estimates are displayed in this table; Group: Pos. = positive classroom emotional climate group, Group: Neg. = negative classroom emotional climate; CFI = Comparative Fit Index, RMSEA = Root Mean Square Error of Approximation, SRMR = Standardized Root Mean Square Residual

† $p < .10$; * $p < .05$; ** $p < .01$; *** $p < .001$

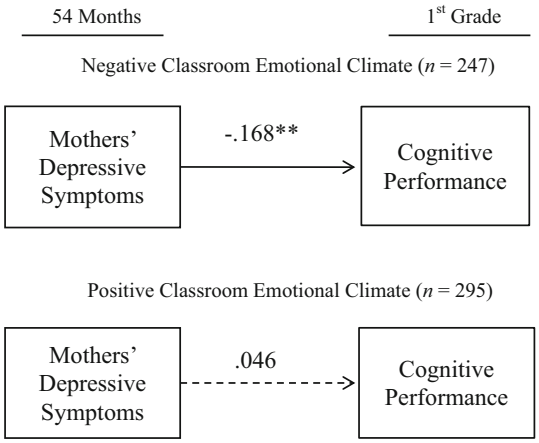

Fig. 2 The associations between mother's depressive symptoms and children's cognitive performance across classrooms characterized by a positive and negative emotional climate

characterized by a more negative emotional climate, children had lower levels of social competence (see also Fig. 1) and poorer cognitive functioning (see also Fig. 2). However, in classrooms characterized by a positive emotional climate, mothers' depressive symptoms were not associated with either outcome. In terms of externalizing problems, although children from both types of classrooms demonstrated externalizing problems in the context of maternal depression, those children from lower emotionally-supportive classrooms were at risk for higher levels of externalizing behavior as compared with children in classrooms characterized by a positive emotional climate (see Fig. 3). To be noted, the difference of effect sizes between the two types of classrooms was modest and, thus, generalizations of these results should be made with caution. Finally, although mothers' depressive symptoms were not significantly associated with relationships with teachers for children from either type of classroom, there was evidence to suggest that children in more emotionally negative classrooms might have developed a less positive relationship with their teachers if their mothers exhibited higher levels of depressive symptoms.

In sum, a positive emotional classroom climate served as a salient protective factor that buffered the negative impacts of mothers' depressive symptoms from 6 to 54 months on children's development across multiple domains, namely: externalizing problems, social competence, cognitive development, and relationships with teachers at first grade. The moderating effect for internalizing problems, however, was not significant.

Discussion

This study sought to determine whether a positive classroom emotional climate would buffer the pathogenic effects of mothers' depression on children's academic and social-behavioral functioning at first grade. Overall, we found that children who were placed in a classroom that was characterized by a warm and positive emotional climate were less likely to be affected by their mothers' depressive symptoms than children in less supportive classrooms. Guided by the bioecological perspective (Bronfenbrenner 2001), the results of this study demonstrate the synergic associations between the two core contexts of child development—the home and school.

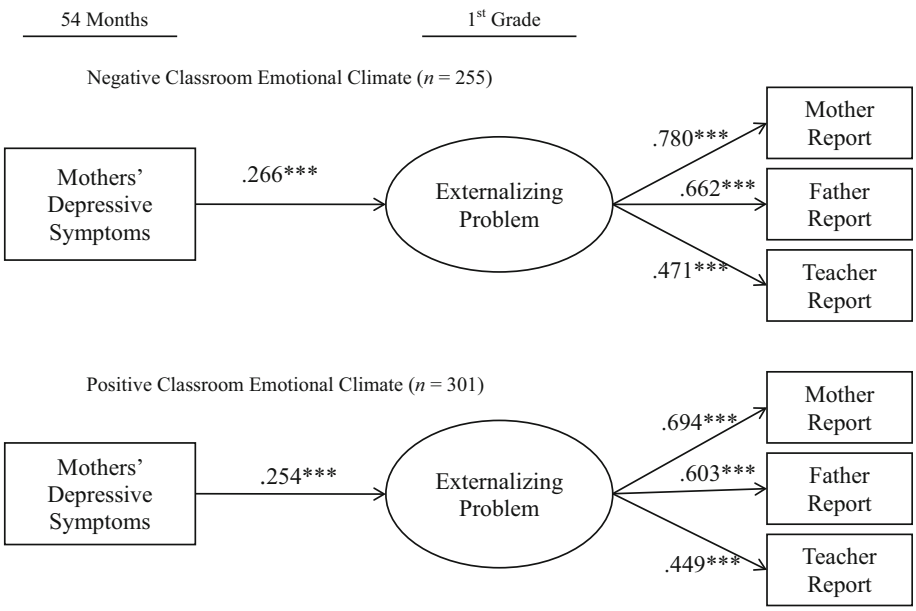

Fig. 3 The associations between mother's depressive symptoms and children's externalizing problems across classrooms characterized by a positive and negative emotional climate

As an important learning and socializing context, the school environment has great potential to affect children's development (Zimmerman and Arunkumar 1994). The current study adds to this body of literature by demonstrating that school-based supportive ties can potentially buffer against the negative conditions at home (Burchinal et al. 1997; Burchinal et al. 1989; Campbell and Ramey 1994; Dubois et al. 1992; Hamre and Pianta 2005; NICHD ECCRN 2003; Pianta 1999; Zimmerman and Arunkumar 1994). Beyond the primary focus on children's demographic risks in prior research (e.g., low maternal education or low socio-economic status), the current study takes a step forward by seeking to understand how the debilitating effects of a more proximal risk factor for children's adjustment—maternal depression—could be mitigated by positive schooling experiences. As suggested by the family stress model (Conger et al. 1992), the impacts of objective economic diversity on children's adjustment are permeated through parents' parenting behaviors and emotional well-being. Maternal depression, as one of the most prevalent mental disorders that is consistently associated with many demographic risks, has been known to compromise parenting competence and to undermine children's adjustment across a wide range of domains (Dix and Meunier 2009; Lovejoy et al. 2000). Therefore, by examining maternal depression as a risk factor and considering other demographic factors as potential confounding factors, the current study provides a more nuanced analysis that can advance our understanding of how protective factors may buffer children's developmental risks inside the family. Just as importantly, these findings are consistent with prior empirical evidence from the literature on early care and education programs that underscore the importance of a positive emotional climate during early childhood in shaping children's later behavioral development and social competence (NICHD ECCRN 2003). Nonetheless, continued research is needed to evaluate whether these earlier experiences also have similar protective effects for children from high-risk families, similar to the classroom emotional climate in elementary school.

The current study extends the existing literature in some important ways. Primarily, unlike prior studies that have examined the role of classroom emotional climate in compensatory or additive main effects models (Zimmerman and Arunkumar 1994), we focused on the interaction of these two contexts which has received less empirical attention. In doing so, we found that the classrooms characterized by a supportive emotional climate ameliorated the negative effects of maternal depression on child adjustment and functioning over time. At least two mechanisms may account for the protective effects that were documented in this study.

First, according to the protective factors model (Zimmerman and Arunkumar 1994), a positive classroom emotional climate can strengthen children's abilities to competently adapt to, and cope with, risks that, in turn, may reduce the probability of negative outcomes that stem from these risk factors. For example, positive and responsive interactions with teachers have been shown to promote children's sense of emotion regulation (Skinner and Belmont 1993), to foster children's perceived self-control through academic improvement (Wilson et al. 2007), and to increase children's perceived support by forming a strong psychological bond with the teacher (Wentzel 2002). These capabilities developed through repeated and enduring proximal interactions in the classroom might be transferred to the home context and serve as protective factors to help children cope with psychological stress associated with maternal depression (Masten 2001; Skill et al. 2006).

Second, the moderating role of the classroom emotional climate could take place in a more indirect manner through changing the reactions of mothers with depression toward their children. From a transactional perspective (Bell and Chapman 1984), children's long-term maladjustment conferred by their mothers' depressive symptoms (i.e., maternal depressive symptoms → child maladjustment) may result from their elicitation of negative and coercive reactions from their mothers with high levels of distress (i.e., child maladjustment → maternal depressive symptoms → child maladjustment). In the context of a nurturing and supportive classroom environment, children's problematic and aversive behaviors could be largely reduced and, thus, may deter the vicious cycle of coercive interactions with mothers with depression. Future studies that explicitly address family and classroom processes are warranted to explicate potential mechanisms, including the role children play in connecting these two developmental systems.

Finally, the present study contributed to the extant literature by examining the protective effects of positive classroom emotional climate against the impact of maternal depression on various domains of child development, which goes beyond the primary focus on academic achievement. In classrooms characterized by a positive emotional climate, children may be allowed more freedom and receive more frequent individual attention from teachers, which may lead to increased motivation, self-regulation, and involvement in classroom learning activities (Crosnoe et al. 2004; Pianta et al. 2002). These enhanced capabilities could potentially increase social competence and cognitive performance, and facilitate positive relationships with teachers. However, there was only modest evidence for the protective role of externalizing behaviors and no evidence to

suggest that the classroom environment buffered the negative effects of maternal depression on children's internalizing problems. This result seems to echo previous findings that teachers are less likely to affect the behaviors of wary and more introverted children. It is likely that, for children with internalizing problems, they have fewer interactions with teachers and peers than other children. Therefore, these children have fewer opportunities to feel the warmth, support, and extra help from teachers and peers, which reduces their opportunities to benefit from the protective effects of a positive classroom emotional climate.

Although this study makes several important contributions to the literature, there are two limitations that should be considered when interpreting our findings. First, the NICHD SECCYD sampled children and families who were from higher socioeconomic backgrounds than children and families from nationally representative samples. Therefore, interpretations and generalizations of our results need to be made with caution. This is important as it remains unclear whether a classroom characterized by a positive emotional climate buffers the negative impacts conferred by mothers' depressive symptoms for children who face a greater number of risk factors. Second, the current study is not ideal in that children's adjustment at the beginning of school entry—before children were exposed to a positive emotional climate—were not controlled due to data limitations. Thus, our results reveal that the classroom emotional climate can potentially reduce the risks of maternal depression for child adjustment during first grade, but not whether the classroom emotional climate produces changes in child adjustment over time.

In closing, the current study leveraged bioecological theory (Bronfenbrenner and Morris 2006) to determine whether children who were enrolled in classrooms that were characterized by high sensitivity, warmth, and emotional support were more resilient to the negative impacts of their mothers' depressive symptoms on various aspects of developmental outcomes at the end of first grade. The findings reported herein underscore the critical role of a warm and emotionally supportive classroom environment and how these factors can interrupt cycles of adverse experiences in the home environment. Thus, this study provided critical insight for future school-based intervention programs aimed at reducing developmental risks among children whose mothers' exhibit high levels of depressive symptoms.

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