**ORIGINAL ARTICLE** 



# Maternal and Paternal Depressive Symptoms, Home Learning Environment, and Children's Early Literacy

Amy K. Nuttall<sup>1</sup> · Laura C. Froyen<sup>1</sup> · Lori E. Skibbe<sup>1</sup> · Ryan P. Bowles<sup>1</sup>

Published online: 19 February 2019 © Springer Science+Business Media, LLC, part of Springer Nature 2019

### Abstract

The present study examined the influence of mothers' and fathers' depressive symptoms on children's early literacy skills. Home learning-related parenting (HLE) was examined as a mediator of these associations. Families (N=465) were recruited through preschools. Results indicate an actor effect of fathers', but not mothers', depressive symptoms on HLE parenting such that fathers who reported more depressive symptoms engaged in fewer HLE activities. A partner effect of fathers' depressive symptoms on HLE parenting indicated that higher levels of fathers' depressive symptoms were associated with lower levels of mothers' home learning activities. Finally, fathers' depressive symptoms negatively related to children's early literacy skills indirectly through mothers' HLE parenting. Findings highlight a process of negative effect of parent depressive symptoms on children's early literacy and emphasize including both mothers and fathers in future research concerned with the influence of parents' depressive symptoms on children's development.

**Keywords** Maternal depression · Paternal depression · Home learning environment · Early literacy · Actor-partner interdependence model

# Introduction

Parental depression negatively affects many domains of child development [1] and has become a topic of increasing focus and concern in both clinical and research settings. This is especially true regarding parents of young children, when prevalence rates are higher for both mothers and fathers relative to the adult population at large [2, 3] and children are most susceptible to the negative effects of parent depressive symptoms [4]. In addition, research shows that even subclinical levels of parental depressive symptoms have negative implications for the family system. This includes the marital relationship and family functioning [5, 6], and, most pertinent to the current study, parenting [7]. Taken together, these findings suggest that many young children, including those in a community sample, are embedded in a context of parental depressive symptomatology that is not conducive to optimal development.

Existing theory and research identify parenting as one of the primary pathways through which parent depressive symptoms influence child outcomes [1, 7]. This large body of literature suggests that depressive symptoms are associated with an increase in negative parenting (e.g. hostility, intrusiveness, and negative interactions) and a decrease in positive parenting (e.g. warmth, sensitivity, and responsiveness; [7]). Although the majority of this literature is based on mother report [8], the few studies that include both mother and father reports indicate that fathers' levels of depressive symptomatology are just as important as mothers' [5, 6, 9].

This pervasive negative effect on family functioning in general, and parenting specifically, has significant negative implications for child development [5]. Moreover, this risk posed by parental depressive symptoms to child development is observed in the context of sub-clinical levels of parental depressive symptoms [10], further suggesting that even low-levels of parental depressive symptoms have a cascade of negative effects for families and children. Specifically, children of depressed parents exhibit increased internalizing and externalizing symptoms and deficits in social development, with children of depressed parents demonstrating fewer prosocial skills and an increased risk for peer exclusion [5]. There is also reason to believe that

Amy K. Nuttall nuttall@msu.edu

<sup>&</sup>lt;sup>1</sup> Department of Human Development and Family Studies, Michigan State University, 552 W. Circle Drive, East Lansing, MI 48824, USA

parental depressive symptoms are detrimental to children's academic development. For example, using data from a nationally representative sample to examine the risk posed by maternal depressive symptoms, researchers reported that children in kindergarten and third grade who had depressed mothers missed significantly more school than children who had mothers who were never depressed [11]. The present study examines whether parental depressive symptoms disadvantages children's academic development even before kindergarten by examining parental depressive symptoms in relation to children's early literacy achievements in a community sample.

Early literacy skills reflect the competencies needed to engage in more conventional reading [12]. Children's early literacy achievements are related to academic performance in grade school [13, 14] and are predictive of career and economic potential [15]. Trajectories of reading development are surprisingly stable, resistant to change, and are established in the preschool years [16, 17], indicating that children's environment prior to entering formal schooling is important to consider in preparing children for academic learning. Although children need to develop many types of early literacy skills, a national panel of experts identified letter knowledge and phonological awareness, the understanding of the sound structure of language, as the most predictive of conventional reading in later grades [12]. This finding influences how early literacy is conceptualized in the present work.

Early literacy skills, which show marked variability in the preschool years, are negatively related to maternal depression [18–20]. Specifically, children of depressed mothers knew fewer letters and had lower receptive language knowledge than their peers with non-depressed mothers [18]. It is important to note that this literature is based nearly entirely on maternal report with only one study examining fathers' depressive symptoms in a high-risk sample of adolescent parents [19]. This study found a negative relation between fathers' depressive symptoms and children's early literacy skills. However, not all studies have supported a direct relation between mother depressive symptoms and children's early literacy [21]. The lack of consensus on the relation between mothers' depressive symptoms and children's early literacy, and the paucity of research on fathers, indicates that the relation between both parents' depressive symptoms on child early literacy outcomes is not yet well understood.

Parents play a crucial role in shaping children's early literacy skills, and the most powerful and frequently examined pathway for this influence is the home learning environment [HLE; 15, 22–26]. The HLE includes parenting practices that are specifically aimed at enhancing early educational outcomes such as shared reading, instructional activities, and educational games [27, 28]. The teaching activities parents engage in with their children are of critical importance for explaining the acquisition of early literacy skills [15, 17]. Research has shown that maternal depressive symptoms influence a variety of parenting practices, including those practices that are conceptualized as a part of the HLE [29]. Specifically, the extant literature indicates that parent-child communication, in amounts and complexity [30], as well as rates of shared-reading [29, 31], drops precipitously among depressed mothers. Furthermore, depressed mothers are less likely to engage in other HLE-related parenting behaviors, such as having a regular reading time, taking the child to the library, and singing to their child [31]. When shared-reading does occur, depressed mothers read for shorter amounts of time and ask fewer questions during the reading interaction than non-depressed mothers [31]. In addition, the overall quality of the interaction is lower than for non-depressed mothers [32]. In one of the few studies to examine the HLE in relation to parent depressive symptoms and early literacy, lower levels of maternal depressive symptoms were associated with greater positive changes in the HLE over time. These positive changes in the HLE were associated with gains in children's expressive and receptive language skills [21], skills that are closely related to early reading ability [33]. However, this research has been relatively limited, particularly when taking into consideration the subsequent effect of depressed mothers' HLE-related parenting on children's early literacy skills.

Although there is some emerging evidence for the influence of parental depressive symptoms on the HLE and, subsequently, children's academic abilities, this body of research has primarily focused on the influence of mothers' depressive symptoms, and rarely considers the role of fathers' depressive symptoms. The role fathers play in child development is receiving increasing attention and this research is showing that fathers contribute in unique ways to children's development [34–36]. In addition, research shows that father-child relationships are just as susceptible to depression as mother-child relationships [1]. Regarding the influence of paternal depression on child educational outcomes specifically, there is some research to indicate that fathers with higher levels of depressive symptoms engage in less shared-reading [37] and this reduction of shared-reading is linked to decreases in expressive vocabulary [37], a skill that is closely related to literacy [33]. Moreover, other work on the HLE has found that fathers' can compensate for mothers' HLE-related parenting when there is a perceived need for additional support [35]. Taken together, these findings suggest that fathers' role in supporting children's educational outcomes is significant and needs to be considered as part of the HLE that children experience, particularly when fathers are experiencing depressive symptoms.

Few studies have jointly considered mothers' and fathers' depressive symptoms on child outcomes and those that do tend to consider each parent's interactions with their child separately. Family systems and human ecological theories contend that mothers, fathers, and their children should be considered a part of a larger, interdependent system [38, 39]. Indeed, research suggests that one parent's level of depression can also influence the other parent's own level of depression [40, 41] and their parenting behaviors [42], suggesting that parent depressive symptoms are not just an individual issue, but also a family issue. By constructing separate mother and father models, the relation between mothers' and fathers' depression and their partners' parenting is not taken into account. Dyadic data analysis approaches have been proposed as theoretically appropriate methods that take into account the interdependent nature of these data [43]. The Actor-Partner Interdependence Model allows for the simultaneous examination of the influence of individual's depression on their own parenting, termed an actor effect, and on their partner's parenting, termed a partner effect [44]. Studies examining the influence of parent depressive symptoms on parenting from a dyadic framework are less common. In particular, there is a paucity of studies examining the effect of depressive symptoms on parenting as driven largely by one's own depressive symptoms (i.e. actor effects) or by one's partner's depressive symptoms (i.e. partner effects).

The only study to date to specifically examine the effect of parent depressive symptoms on an aspect of parenting related to the HLE (shared reading) from a dyadic data analysis perspective found that there were only actor effects for fathers and no partner effects for either mothers or fathers [37]. The results of this study indicated that fathers who reported more depressive symptoms engaged in fewer shared reading interactions, but mothers' shared reading was not influenced by their own depressive symptomatology. This suggests that fathers' shared reading may be more susceptible to depressive symptoms than is mothers'. Neither mothers' nor fathers' depressive symptoms influenced their partners' shared reading. This conflicts with other dyadic research on the nature of the mutual influence of parents' depressive symptoms on their own and each other's parenting [42, 45], indicating that this process may be unique for some aspects of the HLE.

# **The Present Study**

In order to understand the process through which parents' depressive symptoms may negatively influence children's early literacy, the present study examined parental depression, HLE, and early childhood literacy outcomes using a dyadic approach to mediation. Our first goal was to examine the influence of parental depressive symptoms on HLE-related parenting behaviors. We expected that HLE-related parenting would be negatively impacted by parent depressive

symptoms and expected to identify both actor and partner effects of depressive symptoms on HLE-related parenting behaviors for both parents. The second goal of this study was to determine whether parent depressive symptoms negatively influence children's early literacy skills and if this relation is mediated by the HLE. Because the HLE is strongly associated with children's academics, it was hypothesized that parental depressive symptoms would negatively influence children's early literacy skills indirectly through risk to the HLE.

# Method

### Participants

Our community-based sample consisted of 465 families with children who attended one of three preschools associated with a large Midwestern university. Families and their child were recruited as part of an ongoing, multi-site study on children's academic and socioemotional development. This study was reviewed by the university's institutional review board. Children ranged in age from 3.01 to 5.82 years (M=4.11, SD=0.527) with a relatively even gender split (49% boys). Children's ethnicity was reflective of U.S. census data for the counties in which the data was collected [46] and broken down as follows: 85.2% White Non-Hispanic, 4.7% Multi-racial, 3.8% Asian, 3.4% Hispanic or Latino, 1.7% African American, and 0.8% other. Parents were generally well educated, with 56.8% of mothers and 49.3% of fathers having completed at least a bachelor's degree.

### Procedures

Participants were recruited from three preschools using a cohort design to enroll participants into the study in each of three consecutive school years. All families associated with each of the three preschools were invited to participate. In the fall of each year, parents who consented via signature on a written form (n = 788 total) were given a series of questionnaires that assessed their levels of depressive symptomatology and their behaviors related to the HLE that they provided to children. Questionnaires were completed and returned via mail individually by mothers and fathers and this data collection process was separate from the collection of child data. Seventy-four percent of mothers and 49% of fathers who consented returned the questionnaires. Children's early literacy skills were assessed individually in a quiet place in or near children's classrooms by trained research assistants in the fall of each school year.

Independent samples *t*-tests indicated that children whose mothers returned questionnaires did not significantly differ in terms of early literacy skills from those whose mothers did not (Letters:  $M_{difference} = 0.07, t(251) = -0.736; p = .44,$ d = -0.07; Decoding:  $M_{difference} = 0.64$ , t(627) = -0.238; p = .81, d = -0.02; Phonological Awareness:  $M_{difference} =$ 0.28, t(538) = 0.458; p = .65, d = 0.04). In addition, independent samples *t*-tests indicated that, although there were some differences in scores between children whose fathers returned questionnaires and those whose fathers did not, the difference was statistically significant only for decoding (Letters:  $M_{difference} = 0.12$ , t(693) = 1.664; p = .10, d = 0.13; Decoding:  $M_{difference} = 5.28, t(627) = 2.324; p = .02, d = 0.18;$ Phonological Awareness:  $M_{difference} = 0.20, t(538) = -0.373;$ p = .71, d = -0.03). Thirty-nine families reported that English was not the primary language spoken in the home and were excluded from the sample. Given our interest in parental actor-partner effects, we focused on two-parent families; as a result, 97 families were additionally excluded from the present study. Sixteen children were outside the 3-5 years age range of validation for our literacy outcome measures and were also excluded from the present study. The final sample size was 465 families.

### Measures

### **Parental Depressive Symptoms**

In order to determine the level of depressive symptomatology experienced by mothers and fathers in the study, parents completed the nine item Patient Health Questionnaire-9 [PHQ-9; 47]. The PHQ-9 assesses depressive symptoms over the preceding two weeks on a four-point Likert scale ranging from "not at all" to "nearly every day." The PHQ-9 is based on DSM-IV criteria and corresponds well with depression diagnoses across clinical and research settings to discriminate individuals with and without major depression (0.95) and has a test-retest reliability of 0.84 [47]. Cronbach's alpha for the scale in the present sample was 0.75 for mothers and 0.81 for fathers. Differential item functioning indicated no significant differences between mothers and fathers.

### **Home Learning Environment**

The HLE was measured using the HLE scale of the Parenting Questionnaire [26, 48], which is a self-report measure of parenting behaviors. The HLE scale includes seven items such as, "My child and I play number games such as 'This Old Man' and 'One, Two, Buckle My Shoe'," and "How frequently do you teach your child letter sounds." Mothers and fathers were asked to rate, on a scale from 1 to 5, how likely they were to engage in these activities at home. Higher scores indicate that parents provided more learning activities within their homes. The HLE scale has been widely used to assess HLE [e.g., 35, 48, 49] and to directly predict children's general literacy skills, including letter knowledge and decoding [26, 50]. Cronbach's alpha for the scale in the present sample was 0.85 for mothers and for 0.84 fathers. Differential item functioning indicated no significant differences between mothers and fathers.

### **Early Literacy Skills**

Children completed a battery of three gold-standard assessments: letter knowledge, phonological awareness, and decoding, which were used to create a latent early literacy factor. Utilizing a latent factor with multiple indicators to measure early literacy improves our ability to ensure more reliable and accurate measurement of this construct [51]. All three indicators loaded on the early literacy factor (standard-ized loadings for letter knowledge: 0.80, p < .001; phonological awareness: 0.35, p < .001; decoding: 0.98, p < .001).

Children's letter knowledge was measured utilizing a letter identification task wherein children are asked to identify the name of the uppercase or lowercase letter shown. In fall of 2009 and 2010 children were asked to name all 52 upper and lowercase letters. In the fall of 2011, short forms consisting of eight-item subsets of the letters were used, with the specific form assigned randomly and forms equated to each other and to the full 52 letter assessment using an item response theory (IRT) approach [52, 53] so that children's letter knowledge could be examined on the same scale regardless of which form children received. IRTbased reliability exceeded 0.9 for all forms.

Children's phonological awareness was measured via the Test of Preschool Early Literacy [TOPEL; 54]. The phonological awareness subtest of the TOPEL assesses children's blending and elision skills and demonstrates good psychometric properties in the three to five age range, with internal consistency ranging from 0.86 to 0.88 and test–retest reliability of 0.83 [54].

Finally, children's decoding skills, including their early knowledge of letters, words, and decoding abilities; were assessed with the Letter-Word Identification subtest of the Woodcock-Johnson III Tests of Achievement [WJ-III; 55]. Reliability for the Letter-word Identification subtest ranges from 0.96 to 0.99 among children aged three to eight [55, 56].

### **Analytic Strategy**

We examined the effect of mothers' and fathers' depressive symptoms on their own and each other's HLE and on children's early literacy skills while testing maternal and paternal HLE as potential mediators of the associations between maternal and paternal depressive symptoms and child literacy skills. To address these research questions we constructed an Actor-Partner Interdependence Model [APIM; 44] to examine mediation [57] with a structural equation modeling (SEM) framework. We controlled for child gender, minority status, and parent education level. This model is depicted in Fig. 1. Overall model fit was examined using fit guidelines for the Chi square test of absolute fit, the comparative fit index (CFI), and root mean square error of approximation (RMSEA) [58, 59]. Standardized parameter estimates are reported in-text and unstandardized parameter estimates are reported in Table 3. We used a bootstrap resampling approach to test indirect effects [60]. The bootstrap approach is appropriate in models with complex mediation, such as the model utilized in the current study [61]. Unstandardized bootstrap confidence intervals are reported in-text.

Missing data were accounted for using the likelihoodbased estimation approach implemented in Mplus. In the first year of the study (n = 166), the measure of depressive symptoms was not included, resulting in missing data that can be considered missing at random and can be included in the analyses without bias [62]. Likelihood-based approaches to missing data handle high rates of these ignorable missing conditions without sacrificing power [62, 63].

# Results

Means, standard deviations, and correlations among variables are presented in Table 1. We checked distributional assumptions and found no violations. Among those who completed the measure of depressive symptoms, the majority scored in the "minimal" range based on the categorizations established for the PHQ-9 measure [47; Table 2]. One potential outlier for maternal depressive symptoms was both retained and dropped in all analyses; conclusions were consistent. We additionally dropped those participants not administered the PHQ-9 and re-ran analyses; again conclusions were consistent. Therefore, results are reported for all participants.

# Influence of Depressive Symptoms on HLE-Related Parenting and Child Literacy

The model, depicted in Fig. 1, provided an adequate fit for the data  $(\chi^2 (16) = 28.45, p < .05; CFI = 0.98; TLI = 0.94;$ RMSEA = 0.04, 90% CI 0.01, 0.07). Results indicated an actor effect of fathers such that when fathers experienced more depressive symptoms they also reported engaging in fewer HLE-related parenting behaviors ( $\beta = -0.20$ , p < .001), however there was no actor effect of mothers' depressive symptoms ( $\beta = -0.05$ , p = .54). As for partner effects, higher levels of fathers' depressive symptoms were related to lower HLE behaviors for mothers ( $\beta = -0.19$ , p < .001), such that when fathers experienced more depressive symptoms mothers tended to report engaging in fewer HLE-related activities. Conversely, there was no partner effect of mothers' depressive symptoms on fathers' HLE ( $\beta$ = 0.07, p = .46). Finally, mothers' HLE was significantly associated with children's literacy outcomes ( $\beta = 0.25$ , p < .001), but fathers' HLE was not significantly associated with children's literacy outcomes ( $\beta = 0.13, p = .07$ ). Mothers' depressive symptoms were not significantly associated with children's literacy outcomes ( $\beta = 0.01$ , p = .93). Similarly, fathers' depressive symptoms were not significantly associated with children's literacy outcomes  $(\beta = -0.06, p = .46)$ . For the literacy latent variable,  $R^2 = 0.17$  indicating that 17% of the variance in literacy was explained. Unstandardized regression coefficients are presented in Table 3.

Fig. 1 Proposed APIM: effect of parent depression on children's early literacy mediated by the HLE. *HLE* home learning environment; *LNK* letter knowledge; *PA* phonological awareness. Single and doubleheaded arrows represent model specification; variances, residual variances, and covariate effects have been omitted from this figure for simplicity



 
 Table 1
 Descriptive statistics
 and correlations of study variables

Variables	1	2	3	4	5	6	7	
Mother depression	_							
Father depression	0.12	-						
Mother HLE	- 0.09	- 0.25**	-					
Father HLE	- 0.02	- 0.22**	0.39**	-				
Phonological awareness	- 0.10	- 0.16	0.12*	- 0.04	-			
Decoding	- 0.03	- 0.13	0.29**	0.22**	0.33**	-		
Letters	- 0.09	- 0.18*	0.34**	0.28**	0.26**	0.79**	-	
Μ	2.49	2.41	3.36	3.12	13.37	331.26	0.22	
SD	2.97	3.19	0.83	0.81	5.89	27.18	0.96	
Minimum	0	0	1	1	0	264	- 1	
Maximum	20	18	5	5	26	478	3	
Skew	2.42	2.25	- 0.04	- 0.02	- 0.28	0.06	0.19	
Skew S.E	0.16	0.19	0.12	0.14	0.14	0.13	0.12	
Kurtosis	8.05	5.89	- 0.56	- 0.40	- 0.39	1.54	- 0.74	
Kurtosis SE	0.33	0.38	0.23	0.29	0.28	0.25	0.24	
Valid N	220	163	434	290	298	370	419	

\* *p* < .05, \*\* *p* < .01

### Table 2 Depressive symptoms severity categorizations

Severity (PHQ-9 score)	Mothers n = 220	Fathers $n = 163$
Minimal (0–4)	195 (88.63%)	138 (84.66%)
Mild (5–9)	15 (6.82%)	16 (9.82)
Moderate (10–14)	9 (4.10%)	7 (4.29%)
Moderately severe (15-19)	0 (0%)	2 (1.23%)
Severe (20–27)	1 (0.45%)	0 (0%)

# Tests of Indirect and Direct Effects

The indirect effects of mothers' and fathers' depressive symptoms on children's literacy through mother and father HLE were inferred using non-parametric, bias-corrected bootstrap confidence intervals [64]. We used 1000 resamples to construct bias corrected bootstrap 95% confidence intervals around the product coefficient. The indirect effect of mothers' depressive symptoms on children's literacy via mothers' HLE was estimated to lie between -0.02 and 0.01with 95% confidence. The indirect effect of fathers' depressive symptoms on children's literacy via fathers' HLE was estimated to lie between -0.02 and 0.00 with 95% confidence. Therefore, there were no indirect actor effects on children's literacy significant at the 0.05 level.

The indirect effect of mother's depressive symptoms on children's literacy via father's HLE was estimated to lie between -0.01 and 0.01 with 95% confidence, which was not significantly different from zero at the 0.05 level. In contrast, the indirect effect of father's depressive symptoms on children's literacy via mother's HLE was estimated to lie between -0.03 and -0.01 with 95% confidence, suggesting

#### Table 3 Model unstandardized coefficients

	Unstandardized	SE	p-value
Actor effects			
Mother depression $\rightarrow$ mother HLE	- 0.02	0.03	0.56
Father depression $\rightarrow$ father HLE	- 0.05	0.02	0.01
Partner effects			
Mother depression $\rightarrow$ father HLE	0.02	0.03	0.46
Father depression $\rightarrow$ mother HLE	- 0.05	0.02	0.00
Effects of HLE on literacy			
Mother HLE $\rightarrow$ early literacy	0.27	0.07	0.00
Father HLE $\rightarrow$ early literacy	0.15	0.08	0.07
Direct effects			
Mother depression $\rightarrow$ early literacy	0.03	0.03	0.93
Father depression $\rightarrow$ early literacy	- 0.02	0.02	0.47
Covariances			
Mother depression and father depression	1.22	1.3	0.35
Mother HLE and father HLE	0.20	0.04	0.01
Covariate effects			
Child gender $\rightarrow$ mother HLE	- 0.16	0.08	0.05
Child minority $\rightarrow$ mother HLE	0.05	0.14	0.73
Mother education $\rightarrow$ mother HLE	0.03	0.03	0.23
Father education $\rightarrow$ mother HLE	0.05	0.03	0.06
Child gender $\rightarrow$ father HLE	- 0.11	0.10	0.27
Child minority $\rightarrow$ father HLE	0.28	0.13	0.03
Mother education $\rightarrow$ father HLE	- 0.01	0.04	0.96
Father education $\rightarrow$ father HLE	0.04	0.03	0.14
Child gender $\rightarrow$ early literacy	0.04	0.09	0.69
Child minority $\rightarrow$ early literacy	0.04	0.16	0.81
Mother education $\rightarrow$ early literacy	0.06	0.03	0.09
Father education $\rightarrow$ early literacy	0.03	0.03	0.37

an indirect effect significantly different from zero at the 0.05 level.

The direct effect of mother's depressive symptoms on children's literacy, with the inclusion of the HLE mediators and the covariates, was estimated to lie between -0.06and 0.06 with 95% confidence, which was not significantly different from zero at the 0.05 level. The direct effect of father's depressive symptoms on children's literacy, with the inclusion of the HLE mediators and the covariates, was estimated to lie between -0.07 and 0.03 with 95% confidence, which was not significantly different from zero at the 0.05 level. Given this lack of significant direct effects, we next compared this model to a model in which the direct effect of father depressive symptoms on children's literacy was constrained to zero ( $\chi^2$  (1)=0.50, p=.48). These findings suggest that the effect of fathers' depressive symptoms on children's literacy skills is significantly fully mediated by mothers' HLE-related parenting behaviors such that, when fathers reported higher levels of depressive symptomatology, mothers report engaging in fewer HLE-related parenting behaviors, which negatively influences children's early literacy skills.

# Discussion

Previous research repeatedly notes the deleterious effect of parents' depressive symptoms on a variety of children's outcomes [e.g., 5, 18, 19, 37]. Moreover, the associations between parents' depressive symptoms and children's outcomes are often mediated by disruptions to parenting and family functioning [e.g., 6, 65]. The present study extends this body of literature by demonstrating that children's early literacy skills are impacted by fathers' depressive symptoms through mother's parenting in the home learning environment (HLE). Notably, we found that fathers' depressive symptoms negatively predict both their own (actor effect) and mothers' (partner effect) HLE related parenting. Further, fathers' depressive symptoms influenced children's early literacy skills as a significant indirect effect through mothers' HLE-related parenting skills rather than their own HLE-related parenting. The results of this study extend our understanding of the influence of depressive symptoms on children's early academic skills, and the pathway through which this influence occurs. Further, these findings highlight the importance of including both mothers and fathers in studies examining the influence of parents on children's development. By including both mothers and fathers, we detected a partner effect of fathers' depressive symptoms on mothers' HLE-related parenting to determine the pathway through which fathers' depressive symptoms influence children's early literacy skills. In sum, this finding is novel in the literature and broadens our understanding of the complex interaction between parent depressive symptoms and their own and their partner's HLE-related parenting.

### **Actor and Partner Effects**

There are specific symptoms characteristic of depressive symptoms, such as reduced energy and interest in normal activities [66], which may impact parenting. Moreover, parents may compensate for one another's limitations when there is a perceived need to do so [35]. We found that mothers' own depressive symptoms were not significantly associated with their own HLE-related parenting. In contrast, fathers' depressive symptoms were associated with their own HLE-related parenting behavior such that higher levels of paternal depressive symptoms were associated with decreases in their own HLE-related parenting behaviors. Results further indicated that fathers', but not mothers', depressive symptoms also influenced their partners' HLErelated parenting, such that when fathers report higher levels of depressive symptoms, mothers tend to engage in fewer HLE-related parenting behaviors. Null effects are somewhat surprising considering the well-established risk posed by maternal depressive symptoms to other aspects of parenting [7]. Our pattern of findings for partner effects of parent depressive symptomatology on HLE-related parenting is also intriguing in the context of prior findings [e.g., 37, 65]. There are several possible explanations for these novel findings.

First, research suggests that parents' stress increases as their ability to meet the demands of parenting decreases [67] and that parents in contexts often associated with higher parenting stress engage in fewer HLE activities [68]. One reason for this may be that parents in these stressful situations prioritize more essential parenting, such as caring for the physical needs of children, over the less essential parenting associated with the HLE. Similarly, it is possible that when fathers experience higher levels of depressive symptoms they may disengage from their parenting roles [e.g., 69] posing parenting stress to mothers by denying mothers the support of a co-parent and forcing the mother to take on more parenting overall. Such a stress context could force mothers to prioritize more essential parenting tasks over HLE-related parenting. It has also been suggested that, due to traditional gender roles in parenting, mothers may be less likely or less able than fathers to withdraw from their parenting role while experiencing sub-clinical depressive symptoms [37]. For example, fathers engage in fewer HLE behaviors than mothers [35], so father HLE parenting responsibilities may be more easily reduced in the family system and with fewer consequences to children's development than mothers' HLE parenting.

Second, previous research failing to support a partner effect of fathers' depressive symptoms on mothers' HLE

[37] focused on one aspect of the HLE, shared reading, whereas we focused on HLE-related parenting more broadly. Although shared reading is a part of our measure of the HLE, shared reading is only one aspect of the HLE that is frequently linked to children's outcomes [26]. Shared book reading is frequently highlighted in the media, popular parenting sources, and even government initiatives [70]. Given this media attention, it is possible that, in the face of fathers' depressive symptoms and possible increased parenting responsibilities, mothers may continue to engage in shared reading while possibly neglecting other domains of the HLE, including engaging in educational games and instructional activities or taking children to the library. Furthermore, the lack of actor effect for mothers was a surprising finding considering the well-established risk to parenting posed by maternal depressive symptoms [7]; however, HLE captures engagement in learning-related parenting, not the quality of parent-child interactions; as such, mothers experiencing depressive symptoms could engage in HLE-related activities and display negative parenting (e.g. hostility) or lack of positive parenting (e.g. warmth, sensitivity, and responsiveness).

# Influence of Parent Depressive Symptoms on Early Literacy

Despite the evidence that the HLE is crucial in preparing young children for school [15, 35], we do not currently have a complete understanding of the influence of parent depressive symptoms on this specific type of parenting and how this ultimately affects children's early literacy. Although direct effects on literacy were not observed, the present study is the first to identify fathers' depressive symptoms as having a significant, negative indirect effect on children's early literacy skills through mothers' report of their own HLE-related parenting behaviors. Specifically, we found that high father depressive symptoms were related to poorer maternal HLErelated parenting behavior and, in turn, poorer early literacy skills for children in these families. By demonstrating the impact of father depressive symptoms on mothers' parenting and children's literacy, these findings add to a broader body of literature suggesting that fathers' depressive symptomatology has a detrimental effect on the family system [71].

As expected, given the non-clinical nature of the community sample studied, effects of depressive symptoms were relatively small. However, the results show that even small differences in fathers' depressive symptoms have an effect on mothers' HLE and, in turn, children's early literacy skills. Current epidemiological research indicates there is a high prevalence of clinical depression among parents of young children [2, 3], and it is reasonable to assume that even higher proportions of the population are experiencing symptoms of depression at a subclinical level, similar to the parents in the present study. Although our effect size was small, this study shows that even subclinical levels of depression have significant potential to negatively influence children's early literacy skills through parenting. This is important given research that shows small differences in these early literacy skills may translate to large differences later in life [15].

# **Limitations and Future Directions**

There are several important limitations to consider when interpreting these findings. Because socioeconomic status is associated with children's achievement [72], we did our best to account for socioeconomic status by controlling for parent education level, which had a non-significant effect on both HLE and literacy in the present sample; however, we did not collect income data and, thus, socioeconomic status may have influenced our results beyond our attempt to control for this effect. The sample was fairly homogenous in terms of race, parent education and levels of depressive symptoms. It is possible that results would be even stronger in a more ethnically diverse or at-risk sample [73]. It is also possible that actor and partner effects of mothers' depressive symptoms may emerge in a sample with higher levels of depressive symptoms as the effects of depressive symptoms are more subtle in community samples [5, 74]. In addition, parent measures were self-report and may be subject to report bias. Future research in the area should consider obtaining reports from multiple informants, such as partner or clinical diagnostic reports of depression, and observational methods for the HLE, which would allow for greater confidence in the veracity of results. Finally, this research examined concurrent data and examinations of meditational processes in cross-sectional data may yield biased parameter estimates [75]; a longitudinal research design may be able to further clarify the relations between parent depressive symptoms and children's early academic skills. Taking such an approach may reveal that the effect of parent depressive symptomatology is additive over time, as indicated by previous research [76], such that the longer parents are depressed, the more detrimental that depression is to children's early literacy skills.

# **Practical Implications**

This study has important implications for practitioners in both clinical and school settings. Results highlight the importance of screening for and detecting depressive symptoms among parents of young children. Increased attention has been given to the incidence and effects of depression in the postnatal period, for both mothers [77] and fathers [3] and this study suggests that we should be continuing to screen for parent depressive symptoms as children age. This is particularly true for fathers, whose depressive symptoms are repeatedly shown to influence children's outcomes [1].

Children in a typical community sample may benefit from interventions that target both parent depressive symptoms and HLE parenting. Indeed, research shows that changes in parents' depressive symptoms are linked with changes in the HLE over time [21]. Moreover, there is some research to suggest that dyadic approaches to treating depression are more effective and one reason for this may be that the partner of a depressed person may be in need of additional supports [78]. Traditional interventions aimed at enhancing engagement in HLE-related parenting behaviors often attempt to address the contextual barriers to involvement that parents face, with mixed results [27]. This study shows that parent depressive symptoms may be one of these barriers in need of attention.

# Summary

Findings from the present study highlight the importance of considering the potential negative effects of parent depressive symptoms on children's early literacy skills. As a complement to research indicating that maternal depression has deleterious effects on children's development [7, 73], this research emphasizes the importance of considering fathers' mental health as a factor in children's early academic wellbeing. This study highlights the influence of fathers' mental health on mothers' parenting and children's early literacy skills, indicating that failing to include fathers in research provides an incomplete picture of how children's early literacy skills are influenced by parent depressive symptoms and HLE parenting. This study demonstrates that, via mothers' HLE parenting, fathers' depressive symptoms influence the early literacy skills that set children on the road for academic success, underlining the importance of early interventions that include all family members.

### **Compliance with Ethical Standards**

**Conflict of interest** The authors of this study have no potential conflicts of interest to disclose.

**Ethical Approval** All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

**Informed Consent** Informed consent was obtained from all individual participants included in the study.

### References

- Wilson S, Durbin CE (2010) Effects of paternal depression on fathers' parenting behaviors: a meta-analytic review. Clin Psychol Rev 30:167–180. https://doi.org/10.1016/j.cpr.2009.10.007
- Davé S, Petersen I, Sherr L, Nazareth I (2010) Incidence of maternal and paternal depression in primary care: a cohort study using a primary care database. Arch Pediatr Adolesc Med 164:1038– 1044. https://doi.org/10.1001/archpediatrics.2010.184
- Paulson JF, Bazemore SD (2010) Prenatal and postpartum depression in fathers and its association with maternal depression. J Am Med Assoc 303:1961–1969. https://doi.org/10.1001/ jama.2010.605
- Bagner DM, Pettit JW, Lewinsohn PM, Seeley JR (2010) Effect of maternal depression on child behavior: a sensitive period? J Am Acad Child Adoles Psychiatr 49:699–707
- Cummings EM, Keller PS, Davies PT (2005) Towards a family process model of maternal and paternal depressive symptoms: exploring multiple relations with child and family functioning. J Child Psychol Psychiatr 46:479–489. https://doi.org/10.111 1/j.1469-7610.2004.00368.x
- Du R, Schulich TD, Cummings EM (2003) Parental dysphoria and children's internalizing symptoms: marital conflict styles as mediators of risk. Child Dev 74:1663–1681. https://doi.org/10.1 046/j.1467-8624.2003.00630.x
- Lovejoy MC, Graczyk PA, O'Hare E, Neuman G (2000) Maternal depression and parenting behavior: a meta-analytic review. Clin Psychol Rev 20:561–592. https://doi.org/10.1016/S0272 -7358(98)00100-7
- Phares V, Lopez E, Fields S, Kamboukos D, Duhig AM (2005) Are fathers involved in pediatric psychology research and treatment? J Pediatr Psychol 30:631–643. https://doi.org/10.1093/jpeps y/jsi050
- Papp LM, Cummings EM, Goeke-Morey MC (2005) Parental psychological distress, parent-child relationship qualities, and child adjustment: direct, mediating, and reciprocal pathways. Parent Sci Pract 5:259–283. https://doi.org/10.1207/s15327922par0503\_2
- Conners-Burrow NA, McKelvey L, Perry D, Whiteside-Mansell L, Kraleti S, Mesman G, Holmes K, Kyzer A (2016) Low-level symptoms of depression in mothers of young children are associated with behavior problems in middle childhood. Matern Child Health J 20:516–524. https://doi.org/10.1007/s10995-015-1849-0
- Claessens A, Engels M, Curran FC (2015) The effects of maternal depression on child outcomes during the first years of formal schooling. Early Child Res Q 32:80–93. https://doi.org/10.1016/j. ecresq.2015.02.003
- National Early Literacy Panel (2008) Developing early literacy: report of the national early literacy panel. National Institute for Literacy, Washington, DC
- Denton K, West J, Walston J (2003) Reading-young children's achievement and classroom experiences: findings from the condition of education, 2003. National Center for Education Statistics, Washington, DC
- Duncan GJ, Dowsett CJ, Claessens A, Magnuson K, Huston AC, Klebanov P, Pagani LS, Feinstein L, Engel M, Brooks-Gunn J, Sexton H, Duckworth K, Japel C (2007) School readiness and later achievement. Dev Psychol 43:1428–1446. https://doi. org/10.1037/0012-1649.43.6.1428
- Storch SA, Whitehurst GJ (2001) The role of family and home in the literacy development of children from low-income backgrounds. New Dir Child Adolesc Dev 2001:53–72
- Catts HW, Bridges M, Little T, Tomblin JB (2008) Reading achievement growth in children with language impairments. J Speech Lang Hear Res 51:1569–1579. https://doi. org/10.1044/1092-4388(2008/07-0259)

- Skibbe LE, Justice LM, Zucker TA, McGinty AS (2008) Relations among maternal literacy beliefs, home literacy practices, and the early literacy skills of preschoolers with specific language impairment. Early Educ Dev 19:68–88. https://doi.org/10.1080/10409280701839015
- Barbarini O, Bryant D, McCandies T, Burchinal M, Early D, Clifford R, Pianta R, Howes C (2006) Children enrolled in public pre-K: the relation of family life, neighborhood quality, and socioeconomic resources to early competence. Am J Orthopsychiatr 76:265–276. https://doi.org/10.1037/0002-9432.76.2.265
- Fagan J, Lee Y (2013) Explaining the association between adolescent parenting and preschoolers' school readiness: a risk perspective. J Community Psychol 41:692–708. https://doi. org/10.1002/jcop.21565
- Greenberg MT, Lengua LJ, Coie JD, Pinderhughes EE, Bierman K, Dodge KA, McMahon RJ (1999) Predicting developmental outcomes at school entry using a multiple-risk model: four american communities. Dev Psychol 35:403–417. https://doi.org/10.1037/0012-1649.35.2.403
- Son S, Morrison FJ (2010) The nature and impact of changes in home learning environment on development of language and academic skills in preschool children. Dev Psychol 46:1103– 1118. https://doi.org/10.1037/a0020065
- Bjorklund DF, Hubertz MJ, Reubens AC (2004) Young children's arithmetic strategies in social context: how parents contribute to children's strategy development while playing games. Int J Behav Dev 28:347–357. https://doi.org/10.1080/01650 250444000027
- 23. Bjorklund DF, Rosenblum KE (2001) Children's use of multiple and variable addition strategies in a game context. Dev Sci 4:184–194. https://doi.org/10.1111/1467-7687.00164
- Cannon J, Ginsburg HP (2008) 'Doing the math': Maternal beliefs about early mathematics versus language learning. Early Educ Dev 19:238–260. https://doi.org/10.1080/1040928080 1963913
- Collins WA, Maccoby EE, Steinberg L, Hetherington EM, Bornstein MH (2000) Contemporary research on parenting: the case for nature and nurture. Am Psychol 55:218–232. https://doi. org/10.1037/0003-066X.55.2.218
- 26. Morrison FJ, Cooney RR (2002) Parenting and academic achievement: multiple paths to early literacy. In: Borkowski JG, Ramey SL, Bristol-Power M (eds) Parenting and the child's world: Influences on academic, intellectual, and social–emotional development. Erlbaum, Mahwah, pp 141–160
- Hindman AH, Miller AL, Froyen LC, Skibbe LE (2012) A portrait of family involvement during head start: nature, extent, and predictors. Early Child Res Q 27:654–667. https://doi.org/10.1016/j. ecresq.2011.11.002
- Sénéchal M, LeFevre J (2002) Parental involvement in the development of children's reading skills: a 5-year longitudinal study. Child Dev 73:445–460. https://doi.org/10.1111/1467-8624.00417
- Kohl GO, Lengua LJ, McMahon RJ (2000) Parent involvement in school: conceptualizing multiple dimensions and their relations with family and demographic risk factors. J Sch Psychol 38:501–523. https://doi.org/10.1542/peds.110.5.989
- Field T (1995) Infants of depressed mothers. Infant Behav Dev 18:1–13. https://doi.org/10.1016/0163-6383(95)90003-9
- Bigatti SM, Cronan TA, Anaya A (2001) The effects of maternal depression on the efficacy of a literacy intervention program. Child Psychiatr Hum Dev 32:147–162. https://doi. org/10.1023/A:1012250824091
- 32. Reissland N, Shepherd J, Herrera E (2003) The pitch of maternal voice: a comparison of mothers suffering from depressed mood and non-depressed mothers reading books to their infants. J Child Psychol Psychiatr 44:255–261. https://doi. org/10.1111/1469-7610.00118

- Catts HW (1993) The relationship between speech-language impairments and reading disabilities. J Speech Lang Hear Res 36:948. https://doi.org/10.1044/jshr.3605.948
- Downer J, Campos R, McWayne C, Gartner T (2008) Father involvement and children's early learning: a critical review of published empirical work from the past 15 years. Marriage Fam Rev 43:67–108. https://doi.org/10.1080/01494920802010264
- Foster TD, Froyen LC, Skibbe LE, Bowles RP, Decker KB (2016) Fathers' and mothers' home learning environments and children's early academic outcomes. Read Writ 29:1845–1863. https://doi.org/10.1007/s11145-16-9655-7
- 36. Varghese C, Wachen J (2016) The determinants of father involvement and connections to children's literacy and language outcomes: review of the literature. Marriage Fam Rev 52:331–359. https://doi.org/10.1080/0149429.2015.1099587
- 37. Paulson JF, Keefe HA, Leiferman JA (2009) Early parental depression and child language development. J Child Psychol Psychiatr 50:254–262. https://doi.org/10.111 1/j.1469-7610.2008.01973.x
- Lamb ME (2010) The role of the father in child development, 5th edn. Wiley, New York
- Marsiglio W, Amato P, Day RD, Lamb ME (2000) Scholarship on fatherhood in the 1990s and beyond. J Marriage Fam 62:1173– 1191. https://doi.org/10.1111/j.1741-3737.2000.01173.x
- Brennan PA, Hammen C, Katz AR, Brocque LRM (2002) Maternal depression, paternal psychopathology, and adolescent diagnostic outcomes. J Consult Clin Psychol 70:1075. https://doi. org/10.1037/0022-006X.70.5.1075
- Katz J, Beach S, Joiner T (1999) Contagious depression in dating couples. J Soc Clin Psychol 18:1–13. https://doi.org/10.1521/ jscp.1999.18.1.1
- 42. Ponnet K, Wouters E, Mortelmans D, Pasteels I, De Backer C, Van Leeuwen K, Van Hiel A (2013) The influence of mothers' and fathers' parenting stress and depressive symptoms on own and partner's parent-child communication. Fam Process 52:312–324. https://doi.org/10.1111/famp.12001
- 43. Kenny DA, Kashy DA, Cook WL (2006) Dyadic data analysis. Guilford Press, New York
- Kenny DA (1996) Models of non-independence in dyadic research. J Soc Pers Relat 13:279–294. https://doi.org/10.1177/0265407596 132007
- 45. Malmberg LE, Flouri E (2011) The comparison and interdependence of maternal and paternal influences on young children's behavior and resilience. J Clin Child Adolesc Psychol 40:434– 444. https://doi.org/10.1080/15374416.2011.563469
- U.S. Census Bureau (2011) State and county quickfacts: Ingham and Ottowa Counties, MI. Retrieved from http://quickfacts.censu s.gov
- Kroenke K, Spitzer RL, Williams JB (2001) The PHQ-9: validity of a brief depression severity measure. J Gen Intern Med 16:606– 613. https://doi.org/10.1046/j.1525-1497.2001.016009606.x
- Froyen LC, Skibbe LE, Bowles RP, Blow AJ, Gerde HK (2013) Marital satisfaction, family emotional expressiveness, home learning environments, and children's emergent literacy. J Marriage Fam 75:42–55. https://doi.org/10.1111/j.1741-3737.2012.01035 .x
- Konishi H, Froyen LC, Skibbe LE, Bowles RP (2018) Family context and children's early literacy skills: the role of marriage quality and emotional expressiveness of mothers and fathers. Early Child Res Q 42:183–192
- Hindman AH, Morrison FJ (2012) The impact of parenting dimensions on preschool literacy and learning-related social skills in a middle-income sample. Merrill-Palmer Q 58:191–223. https://doi. org/10.1353/mpq.2012.0012
- 51. vonOertzen T, Hertzog C, Lindenberger U, Ghisletta P (2010) The effect of multiple indicators on the power to detect interindividual

differences in change. Br J Math Stat Psychol 63:627–646. https ://doi.org/10.1348/000711010X486633

- Bowles RP, Pentimonti JM, Gerde HK, Montroy JJ (2013) Item response analysis of uppercase and lowercase letter name knowledge. J Psychoeduc Assess 32:146–156. https://doi. org/10.1177/0734282913490266
- Phillips BM, Piasta SB, Anthony JL, Lonigan CJ, Francis DJ (2012) IRTs of ABCs: children's letter name acquisition. J Sch Psychol 50:461–481. https://doi.org/10.1016/j.jsp.2012.05.002
- 54. Lonigan CJ, Wagner RK, Torgesen JK, Rashotte CA (2007) Test of preschool early literacy. Pro-Ed, Austin
- 55. Woodcock RW, McGrew KS, Mather N (2001) Woodcock–Johnson III. Riverside Publishing, Rolling Meadows
- Woodcock RW, McGrew KS, Schrank FA, Mather N (2001) 2007). Woodcock–Johnson III Normative Update. Riverside Publishing, Rolling Meadows
- Ledermann T, Macho S, Kenny DA (2011) Assessing mediation in dyadic data using the actor-partner interdependence model. Struct Equ Modeling 18:595–612. https://doi.org/10.1080/10705 511.2011.607099
- Browne MW, Cudeck R (1993) Alternative ways of assessing model fit. Sage Focus Editions 154:136–136
- Hu LT, Bentler PM (1998) Fit indices in covariance structure modeling: sensitivity to under parameterized model misspecification. Psychol Methods 3:424. https://doi. org/10.1037/1082-989X.3.4.424
- Shrout PE, Bolger N (2002) Mediation in experimental and nonexperimental studies: new procedures and recommendations. Psychol Methods 7:422–445. https://doi. org/10.1037/1082-989X.7.4.422
- Preacher KJ, Hayes AF (2008) Asymptotic and resampling strategies for assessing and comparing indirect effects in multiple mediator models. Behav Res Methods 40:879–891. https://doi. org/10.3758/BRM.40.3.879
- 62. Enders CK (2010) Applied missing data analysis. Guilford Press, New York
- Enders CK, Bandalos DL (2001) The relative performance of full information maximum likelihood estimation for missing data in structural equation models. Struct Equ Model 8:430–457. https:// doi.org/10.1207/S15328007SEM0803\_5
- Mackinnon DP, Lockwood CM, Williams J (2004) Confidence limits for the indirect effect: distribution of the product and resampling methods. Multivar Behav Res 39:99–128
- Cummings EM, Cheung RYM, Davies PT (2013) Prospective relations between parental depression, negative expressiveness, emotional insecurity, and children's internalizing symptoms. Child Psychiatr Human Dev 44:698–708. https://doi.org/10.1007/s1057 8-013-0362-I
- 66. American Psychiatric Association (2013) Diagnostic and statistical manual of mental disorders, 5th edn. American Psychiatric Publishing, Arlington

- Cooper CE, McLanahan SS, Meadows SO, Brooks-Gunn J (2009) Family structure transitions and maternal parenting stress. J Marriage Fam 71:558–574. https://doi.org/10.111 1/j.1741-3737.2009.00619.x
- Skibbe LE, Grimm KJ, Stanton-Chapman TL, Justice LM, Pence KL, Bowles RP (2008) Reading trajectories of children with language difficulties from preschool through grade five. Lang Speech Hear Serv Schools 39:475–486. https://doi. org/10.1044/0161-1461(2008/07-0016)
- Fincham FD, Beach SRH, Harold GT, Osborne LN (1997) Marital satisfaction and depression: different causal relationships for men and women? Psychol Sci 8:351–357
- U. S. Department of Health and Human Services (2010) Healthy People 2020. Retrieved from: http://www.healthypeople. gov/2020/default.aspx
- Kouros CD, Merrilees CE, Cummings EM (2008) Marital conflict and children's emotional security in the context of parental depression. J Marriage Fam 70:684–697. https://doi.org/10.111 1/j.1741-3737.2008.00514.x
- Duncan GJ, Yeung WJ, Brooks-Gunn J, Smith JR (1998) How much does childhood poverty affect the life chances of children? Am Sociol Rev 63:406–423
- Evans GW, Li D, Whipple SS (2013) Cumulative risk and child development. Psychol Bull 139:1342–1396. https://doi. org/10.1037/a0031808
- Gelfand DM, Teti DM (1990) The effects of maternal depression on children. Clin Psychol Rev 10(3):329–353. https://doi.org/10.1016/0272-7358(90)90065-I
- Maxwell SE, Cole DA (2007) Bias in cross-sectional analyses of longitudinal mediation. Psychol Methods 12:23–44. https://doi. org/10.1037/1082-989X.12.1.23
- Sektnan M, McClelland MM, Acock A, Morrison FJ (2010) Relations between early family risk, children's behavioral regulation, and academic achievement. Early Child Res Q 25:464–479. https ://doi.org/10.1016/j.ecresq.2010.02.005
- Zimmer KP, Minkovitz CS (2003) Maternal depression: an old problem that merits increased recognition by child healthcare practitioners. Curr Opin Pediatr 15:636–640. https://doi. org/10.1097/00008480-200312000-00016
- Keller PS, Cummings EM, Peterson KM, Davies PT (2009) Marital conflict in the context of parental depressive symptoms: implications for the development of children's adjustment problems. Soc Dev 18:536–555. https://doi.org/10.111 1/j.1467-9507.2008.00509.x

**Publisher's Note** Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.