

Depressive Symptoms in Third-Grade Teachers: Relations to Classroom Quality and Student Achievement

Leigh McLean and Carol McDonald Connor
Arizona State University

This study investigated associations among third-grade teachers' ($N = 27$) symptoms of depression, quality of the classroom-learning environment (CLE), and students' ($N = 523$, $M_{\text{age}} = 8.6$ years) math and literacy performance. Teachers' depressive symptoms in the winter negatively predicted students' spring mathematics achievement. This depended on students' fall mathematics scores; students who began the year with weaker math skills and were in classrooms where teachers reported more depressive symptoms achieved smaller gains than did peers whose teachers reported fewer symptoms. Teachers' depressive symptoms were negatively associated with quality of CLE, and quality of CLE mediated the association between depressive symptoms and student achievement. The findings point to the importance of teachers' mental health, with implications for policy and practice.

The purpose of this study is to explore the extent to which teachers' depressive symptoms affect the quality of the classroom-learning environment (Q-CLE) and students' academic achievement in third grade. Third grade is a critical juncture in young children's academic development and in many states in the United States it is the 1st year that students' achievement will be tested using high-stakes assessments. Schools and teachers are judged based on third graders' academic performance with reputation, funding, and jobs at stake. Moreover, and perhaps more importantly, students who are not reading well by the end of third grade are less likely to experience long-term academic and life success (Reynolds & Ou, 2004; Spira, Bracken, & Fischel, 2005).

Following dynamic systems theories (Yoshikawa & Hsueh, 2001), specifically the bioecological model of development (Bronfenbrenner & Morris, 2006), we conceptualize the classroom as a complex microsystem that includes key sources of influence that

impact students' development. According to Bronfenbrenner and Morris (2006, p. 796), "growing hecticness, instability, and chaos in the principal settings in which human competence and character are shaped are considered harmful to development." Thus, we conjecture that a teacher's expression of depressive symptoms within the CLE might contribute to its instability, leading to negative implications for students' developmental processes.

A significant innovation of this study is its conceptualization of depression as an ongoing constellation of symptoms. Related research has examined individual correlates of depression, such as stress or career burnout (Chang, 2009; Hamre, Pianta, Downer, & Mashburn, 2008; Roeser, Skinner, Beers, & Jennings, 2012); however, few have studied such symptoms concurrently as a constellation of symptoms. We conjecture that teachers with diagnosable clinical depression, that is, teachers who experience multiple symptoms, are different from those who are temporarily suffering from individual symptoms, such as stress. Although the use of clinical diagnosis is beyond the scope of this study, our assessment of depression *risk* based on comprehensive symptomatology is a valuable first step toward more clearly defined research in this area. An additional innovation is the consideration of the Q-CLE and student *academic* outcomes whereas others focus on teacher performance and belief outcomes.

The authors would like to acknowledge Dr. Angela Barrus, Dr. Nicole Sparapani, Dr. Stephanie Day, Sarah Ingebrand, and Julie Fellows for their contributions to the editing and revising of this report and Dr. Elizabeth Crowe and Dr. Andrea Carlisle for assistance with data collection and questionnaire design. We would also like to thank the participating schools, teachers, students, and families of student participants, without whose cooperation this research would not be possible. Funding for this project was provided by the U.S. Department of Education Institute of Education Sciences (R305H04013 and R305B070074) and the National Institute of Child Health and Human Development (R01HD48539, R21HD062834, and P50HD052120).

Correspondence concerning this article should be addressed to Leigh McLean, 2063 E. Aspen Drive, Tempe, AZ 85282. Electronic mail may be sent to leighmclean87@gmail.com.

© 2015 The Authors

Child Development © 2015 Society for Research in Child Development, Inc. All rights reserved. 0009-3920/2015/8603-0021

DOI: 10.1111/cdev.12344

Foundational Research in Clinical Depression

Clinical depression is recognized by the *Diagnostic and Statistical Manual of Mental Disorders–V* as a mental disorder and is characterized by ongoing negative mood, low self-esteem, and a loss of interest or pleasure in enjoyable activities (American Psychiatric Association, 2013). Diagnosis is based on self-reporting and evaluation by a clinician; a certain number of symptoms must be present for an ongoing amount of time in order to qualify diagnosis. Clinical depression is the leading cause of disability in U.S. citizens between the ages of 15 and 44, and affects approximately 6.7% of the population. The median onset age of depression is 32, and it has been found to be more prevalent in women (National Institute of Mental Health, n.d.).

The adverse effects of maternal depression on child development have been well documented. Children of depressed mothers exhibit poorer academic and social competence and more behavioral problems (Murray & Cooper, 1997; Supplee, Shaw, Hailstones, & Hartman, 2004). High-quality mother–child relationships have been found to buffer against the effects of developmental risk factors that lead to lower academic achievement (NICHD Early Child Care Research Network, 2007). As depressed mothers are at risk for developing low-quality relationships with their children, these protective effects may not be available. Interestingly, O'Connor and McCartney (2007) found that a positive teacher–child relationship buffered against the effects of insecure mother–child attachment, pointing to the importance of teachers' emotional stability in the classroom. We anticipate that because teachers are viewed to act "in loco parentis" within the school, the effects of depression in the mother–child relationship will be mirrored with teachers and their students.

Teacher Depression in the Classroom

Teacher practices and the Q-CLE are important contributors to children's development (Hamre & Pianta, 2007; Ponitz, Rimm-Kaufman, Grimm, & Curby, 2009). Because teachers are responsible for the implementation of many important classroom factors, they play a crucial role in defining the learning context in which students participate (Eccles & Roeser, 1999). Although past studies have focused on the effectiveness of CLEs, instructional techniques employed by teachers, and teacher–student interactions (Connor et al., 2010; Hamre & Pianta, 2005), fewer studies have investigated the

contributions of teachers' psychological health, even in light of growing concern about the effects of teachers' chronic stress on educational quality (Alliance for Excellent Education, 2005).

Individual depressive symptoms, such as stress and poor emotional regulation, have been found to affect teachers' contribution to the CLE. An optimal classroom climate has been described to have

low levels of conflict and disruptive behavior, smooth transitions from one type of activity to another, appropriate expressions of emotion, respectful communication and problem solving, strong interest and focus on tasks, and supportiveness and responsiveness to individual differences and students' needs. (La Paro & Pianta, 2003)

Teachers' negative psychological characteristics may influence this climate. For example, personal stress in teachers has been associated with lower quality classroom interactions, and teachers who have stronger emotion regulation are more likely to reinforce positive student behavior and respond supportively to students' negative emotions (Li-Grining et al., 2010; Swartz & McElwain, 2012). Mashburn, Hamre, Downer, and Pianta (2006) found that teachers who exhibited more maladaptive psychological characteristics were more likely to rate their relationships with students as hostile. Additionally, Hamre et al. (2008) found that classroom emotional climate and teacher stress level were predictive of teachers' reports of conflict, over and above students' diagnosed behavior problems.

While these studies strongly support the notion that teachers' everyday interactions with students, classroom management, reactions to student behavior, and ability to implement curriculum are impacted by the presence of depressive symptoms, few conceptualize "depression" as a whole construct composed of multiple symptoms, while those that do have found mixed results. Hamre and Pianta (2004) found that nonfamilial caregivers with more depressive symptoms showed less engagement and sensitivity and more withdrawal in their interactions with children. However, Pianta et al. (2005) found that a similar relation between caregivers' depression and the classroom climate became nonsignificant when other teacher characteristics were added as predictors of child-care quality outcomes. We seek to build on and extend these studies by expanding the focus from specific correlates to a comprehensive constellation of characteristics that indicate depression risk, and by

introducing potential mediating factors into the relations between primary variables of interest.

Research Questions and Hypotheses

In order to explore the associations among teachers' depressive symptoms, Q-CLE, and student academic achievement, we pose the following research questions: First, what is the relation between risk for depression in teachers and the Q-CLE? Second, do students of teachers who exhibit higher depression risk display lower levels of academic achievement compared to their peers who have lower risk teachers? And finally, does the Q-CLE mediate the association between teachers' depression risk and students' academic achievement?

We predict that as teachers' depression risk increases, levels of observed CLE quality will decrease (RQ1). Furthermore, we anticipate that as risk for depression increases in teachers, student academic achievement will decrease (RQ2). We also hypothesize that the impact of teachers' depression risk on student outcomes will operate through the Q-CLE (RQ3).

Method

Participants

The data for this study were collected during 2010–2011 as part of an ongoing parent study investigating classroom instruction in early education (Connor et al., 2013), which began in 2005. Five hundred twenty-three third-grade students in 27 classrooms across eight schools in North Florida comprise the sample for the present study. School percentages of students qualifying for Free and Reduced Lunch ranged from 92% (low socioeconomic status [SES]) to 4% (high SES). All teachers met state certification requirements and had at least a bachelor's degree related to education. Teachers' years of experience ranged from 0 to 31 years, with a mean of 10.9. Forty-six percent of students were male, 82% were Caucasian, 7% were African American, 5% were Hispanic, and 6% were Asian or mixed-race. The age of students ranged from 7 to 11 years, with a mean of 8.6. Teachers participated in interventions as part of the parent study, which focused on individualized instruction in either reading or mathematics. These interventions were not focused on teachers' psychological characteristics, and exploratory analyses revealed no significant differences in levels of

depression, or in the rated Q-CLE, between the intervention groups.

Measures

Teacher Risk for Depression

Teachers completed an adapted version of the Center for Epidemiologic Studies Depression Scale (Radloff, 1977; $\alpha = .85$). This scale includes 20 questions that ask subjects to report the frequency of their depressive symptoms. Scores range from 0 to 60 with 16 or higher indicating possible clinical depression. The adapted measure added 18 of the 20 questions to a larger self-efficacy survey to alleviate concerns about teachers' sensitivity to a formal measure of depression. The Likert scale was increased from 3 to 5 points in order to capture more nuanced levels of depressive symptoms, with a score of 1 = *complete absence of a symptom* and a 5 = *constant presence of a symptom*. Depression risk questions were scored separately from self-efficacy questions to determine each teacher's level of self-reported symptomatology. Scores on this measure ranged from 22 to 62 with a mean score of 36. Although few teachers reported high levels of depressive symptoms, there was enough variability among teachers to continue with analyses. The adapted measure displayed acceptable reliability at $\alpha = .75$. Teachers involved in this study were not professionally assessed for clinical depression nor did the questionnaire ask about any diagnosis of depression. We consider our measure an assessment of general *risk* for depression based on the presence of self-reported symptoms. It was beyond the scope of the study to base evaluation of depression on actual diagnosis.

Classroom Quality

Q-CLE was assessed using the CLE rubric (Connor et al., 2011; Connor et al., 2014), an observational measure used within the parent study, which is available upon request. This scale assesses classrooms across three dimensions: implementation of individualized instruction, organization/planning, and teacher warmth/responsiveness. Scores on each dimension range from 1 to 6, with a score of 6 indicating exemplary practice on the part of the teacher and a score of 1 indicating weaker practice. This rubric is conceptualized to represent classroom quality, as opposed to teacher quality, as it takes into account students' and teachers' reciprocal

interactions during instruction as well as the developmental appropriateness of the context of the educational environment. An exemplary rating (scored 6) on the “organization/planning” dimension would indicate a classroom that is “well-organized in its physical systems and instruction, with evident classroom routines and efficient transitions.” An exemplary rating on the “teacher warmth/responsiveness” dimension would indicate a classroom that “consistently offers a positive learning environment with clear expectations for students’ behavior as a member of the learning community.” Finally, an exemplary score in “implementation of individualized instruction” would refer to a classroom in which “the content of literacy/math instruction is differentiated” and “the entire language arts/math block is spent in meaningful literacy/math activities.”

CLE was assessed in the winter using classroom video observations that lasted approximately 60 min. Raters demonstrated adequate levels of interrater reliability (Cohen’s $\kappa = .73$; Landis & Koch, 1977) upon initial assessment, and this level of reliability was maintained after recoding a randomly selected 10% of the videos. In other studies, this measure has predicted students’ achievement outcomes (e.g., Connor et al., 2014), providing evidence for its validity (Ochs, 1979). The three dimensions of the CLE rubric were moderately to highly correlated with each other (correlations ranged from .33 to .58, $p < .001$).

Student Academic Measures

Student academic skills were assessed using the Woodcock–Johnson III Tests of Achievement (Woodcock, McGrew, & Mather, 2001) and the Gates–MacGinitie literacy tests (MacGinitie, MacGinitie, Maria, & Dreyer, 2000). Tests were administered in the fall and spring following normed testing protocols.

Letter-Word Identification (WJ-3). Students read increasingly difficult words ($\alpha = .94$).

Picture Vocabulary (WJ-3). Students verbally identify increasingly difficult pictures ($\alpha = .81$).

Passage Comprehension (WJ-3). Students fill out missing words from passages ($\alpha = .88$).

Gates–MacGinitie Reading Test. Two separate portions of this test measure reading comprehension and vocabulary (α s = .91 for vocabulary and .92 for comprehension).

Math Fluency (WJ-3). Students perform increasingly difficult foundational math functions ($\alpha = .90$).

Table 1
Factor Loadings for Fall and Spring Student Mathematics and Literacy Achievement

| | Fall literacy | Spring literacy |
|--------------------------------|---------------|-----------------|
| Gates–MacGinitie Vocabulary | .90 | .88 |
| Gates–MacGinitie Comprehension | .84 | .82 |
| Letter-Word Identification | .86 | .83 |
| Picture Vocabulary | .72 | .77 |
| Passage Comprehension | .88 | .86 |
| | Fall math | Spring math |
| Math Fluency | .89 | .88 |
| Applied Problems | .89 | .88 |

Applied Problems (WJ-3). Word problems of increasing difficulty ($\alpha = .93$).

Principal Components Analysis

Principal components analysis was used to create separate factor scores for the student math and literacy outcome variables using standard scores (which adjust for age) for the WJ-3 and Estimated Scaled Scores (not age adjusted) on the Gates and for ratings of the CLE. This technique provided a more manageable number of variables without substantial loss of information. The WJ-3 literacy variables and the Gates–MacGinitie vocabulary and comprehension variables (for fall and spring, separately) loaded onto the fall and spring literacy factors, and the WJ-3 fall and spring math variables loaded onto the fall and spring math factors (Table 1). The CLE factor was composed of total scores on each of the subscales being loaded onto one factor (Table 2). All variables loaded strongly onto their intended factors.

Results

All teachers filled out and returned the teacher depression survey and all classrooms were assessed

Table 2
Factor Loadings for Q-CLE, Composed of Each Rubric Subscale

| | Q-CLE component |
|-------------------------------|-----------------|
| Orientation/organization | .83 |
| Implementation of instruction | .77 |
| Warmth/control | .68 |

Note. Q-CLE = quality of the classroom-learning environment.

Table 3
Mean Achievement Scores for Students (Presented in Estimated Scaled Scores [ESS] and Standard Scores [SS] as Indicated)

| | Fall | SD | Winter | SD | Spring | SD |
|-------------------------------|--------|-------|--------|-------|--------|-------|
| G.M. Vocabulary ESS | 474 | 37.3 | | | 497.44 | 37.84 |
| G.M. Comprehension ESS | 471.99 | 40.31 | | | 487.22 | 42.67 |
| Letter-Word Identification SS | 107.01 | 10.62 | 106.77 | 10.66 | 107.61 | 10.93 |
| Picture Vocabulary SS | 103.08 | 9.68 | 103.57 | 9.7 | 103.71 | 9.77 |
| Passage Comprehension SS | 97.8 | 9.72 | 98.03 | 9.3 | 98.52 | 9.237 |
| Math Fluency SS | 100.25 | 12.63 | 101.21 | 13.27 | 102.03 | 12.72 |
| Math Applied Problems SS | 102.04 | 12.92 | 102.59 | 12.55 | 105.74 | 11.83 |

Note. G.M. = Gates–MacGinitie.

Table 4
Teacher Depression Predicting Spring Math Factor Scores, Controlling for Fall Math Scores

| Fixed effect | Coefficient | SE | <i>t</i> ratio | <i>df</i> | <i>p</i> |
|---|-------------|--------------------|----------------|-----------|----------|
| Student spring math score (fitted mean) | 0.016 | 0.033 | 0.497 | 23 | .624 |
| Teacher depression effect | −0.0005 | 0.004 | −0.132 | 23 | .896 |
| Student fall math effect | 0.813 | 0.033 | 24.738 | 287 | < .001 |
| Fall Math × Teacher Depression interaction effect | 0.009 | 0.004 | 2.180 | 287 | .030 |
| Random effect | SD | Variance component | <i>df</i> | χ^2 | <i>p</i> |
| INTRCPT1, <i>u</i> 0 | 0.053 | 0.003 | 23 | 26.391 | .282 |
| Level 1, <i>r</i> | 0.542 | 0.294 | | | |

Note. Factor scores centered at 0 with *SD* = 1. All other scores grand mean centered. Teacher depressive symptoms score mean = 36.

for quality using the CLE scale. In the fall, 18 and, in spring, 64 of the 523 student participants did not complete the battery of academic achievement measures. Students' missing data in this study were determined to be negligible and missing at random; no significant differences were found among students who did not complete testing. These students were absent on testing days due to sickness or family vacations, or had permanently left the school district by the end of the year. Maximum likelihood estimations were used in analyses where appropriate. Students entered third grade with generally age-appropriate skills and made expected gains by spring (Table 3) that were deemed to be at grade level based on standard scores ($M = 100$, $SD = 15$).

We conducted zero-order correlations to examine the associations between teacher depression and Q-CLE (RQ1). We found a moderately sized negative correlation ($r = -.406$, $p < .001$), which supports our initial hypothesis that as teachers' depressive symptoms increase, Q-CLE decreases. We then used hierarchical linear modeling (Raudenbush & Bryk, 2002), which accounts for the nested structure of the data (students within classrooms) to answer our

second and third research questions. Students' spring literacy and math factor scores were each examined separately as a function of teachers' depressive symptoms and students' fall achievement. These models revealed an interaction effect such that teachers' depressive symptoms and students' fall mathematics scores interacted to affect students' spring math scores (Table 4 and Figure 1). This interaction indicated that students who began the year with weaker mathematics scores and were in a classroom with a teacher who reported more depressive symptoms showed weaker achievement gains across the school year than did their peers whose teachers reported no or fewer symptoms.

We investigated the third research question by examining the mediation effects (Baron & Kenny, 1986) of Q-CLE on the relation between teacher depression and student math outcomes (Table 5). When Q-CLE was added to the model, teachers' depressive symptoms no longer predicted student math achievement. Q-CLE fully mediated the effect of teacher depression on student mathematics outcomes. There was also a Fall Math × Q-CLE interaction effect such that students with weaker fall math scores demonstrated stronger math gains

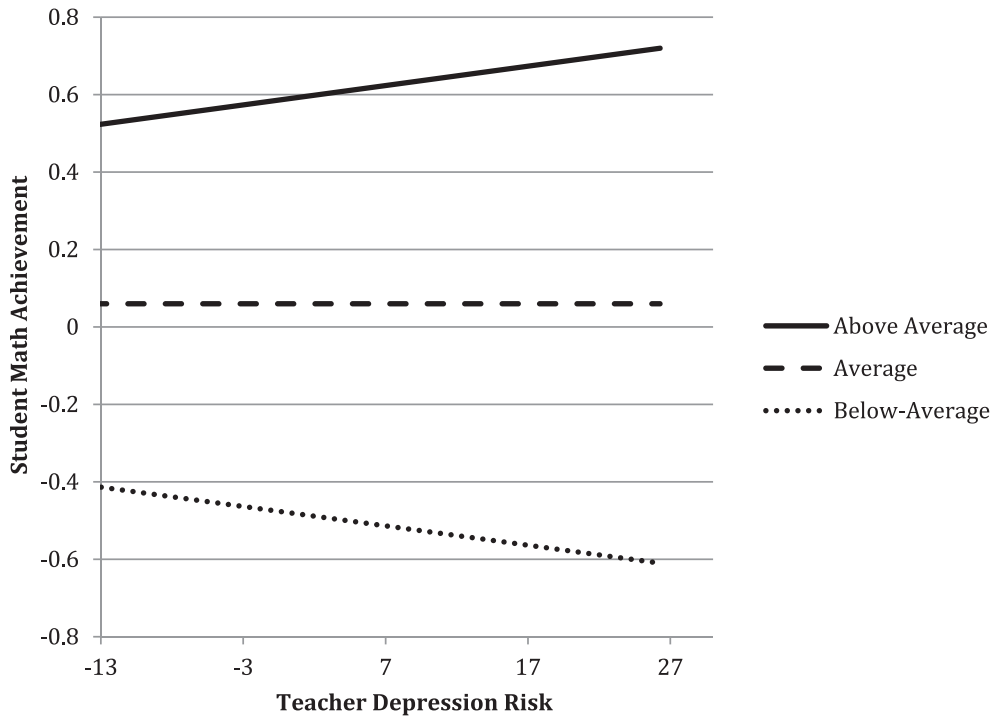


Figure 1. Teacher Depressive Symptoms × Fall Math Score interaction effects on student spring math scores ($M = 0$, $SD = 1$).

Table 5
Effects of Teacher Depressive Symptoms on Spring Math Are Mediated by Q-CLE

| Fixed effect | | Coefficient | SE | t ratio | df | p |
|---|--|-------------|-------|---------|-----|--------|
| Student spring math score (fitted mean) | | 0.011 | 0.029 | 0.390 | 22 | .700 |
| Teacher depression effect | | 0.002 | 0.003 | 0.667 | 22 | .512 |
| Q-CLE effect | | 0.058 | 0.019 | 2.988 | 22 | .007 |
| Student fall math effect | | 0.820 | 0.037 | 22.107 | 286 | < .001 |
| Fall Math × Teacher Depression interaction effect | | 0.006 | 0.005 | 1.325 | 286 | .186 |
| Fall Math × Q-CLE | | -0.057 | 0.022 | -2.548 | 286 | .011 |

| Random effect | SD | Variance component | df | χ^2 | p |
|-------------------|-------|--------------------|----|----------|------|
| INTRCPT1, μ_0 | 0.044 | 0.002 | 22 | 24.581 | .317 |
| Level 1, r | 0.541 | 0.292 | | | |

Note. Factor scores centered at $M = 0$ with $SD = 1$. All other scores grand mean centered. Teacher depressive symptoms score mean = 36. Q-CLE = quality of the classroom-learning environment.

when they were in higher quality CLEs compared to peers in lower quality CLEs.

Discussion

This study revealed that teachers reporting more depressive symptoms were less likely to maintain high-quality CLEs. Additionally, students whose teachers reported more depressive symptoms demonstrated weaker math achievement, especially if

they began the school year with weaker math skills, compared to students whose teachers reported fewer depressive symptoms. This relation between teacher depressive symptoms and student math achievement was mediated by Q-CLE. The importance of Q-CLE was further underscored by the finding that students with weaker math achievement made greater gains when they were in higher quality CLEs. These findings support our conceptualization of student learning whereby distal sources of influence (teachers' depressive symptoms) operate

within the microsystem of the classroom to impact student learning.

Our hypothesis regarding achievement was supported for math but not for reading. This pattern of results is reflected within the larger parent study, which found that students in reading intervention classrooms made greater gains in reading than did students in mathematics intervention classrooms, and there was no effect of the mathematics intervention on student achievement. These differential effects between reading and mathematics observed in the parent study could have carried over into the present study, and there are multiple reasons this may have happened. In 2010, the district introduced a new core mathematics curriculum, *Everyday Math*. The previous curriculum, *Saxon Math*, had been used for at least the previous 3 years and was more skill focused than the conceptually focused *Everyday Math*. Hence, there was the additional burden of learning a new way of teaching mathematics, which was not the case for reading. This coupled with the fact that early elementary teachers are generally less comfortable teaching mathematics compared to reading (Beilock, Gunderson, Ramirez, & Levine, 2010; Vinson, 2001) may have made their mathematics teaching more vulnerable to sources of influence such as depression. Furthermore, teachers in Florida have received extensive training in reading instruction since 2002 under Reading First and other state programs; therefore, reading instruction might be more robust than math instruction in this particular population.

Theoretical and Practical Implications

Dynamic systems theories hold biological and ecological processes at their core as they attempt to model the interaction of biology and environment across time as influences on development. Within this study, the bioecological model is used to examine the microsystems (i.e., CLE) to which children are exposed, and how perturbations to these microsystems (teachers' depression) influence change in their participants (students). A strong focus on *reciprocity* is held here, as the bioecological model holds that developmental processes are not unidirectional. Thus, teachers' depression and negative student math outcomes potentially form a loop, wherein teachers become more depressed, leading to more maladaptive CLEs and poorer student outcomes, leading to more vulnerability to depression for teachers, and so on. Here, the importance of *identifying* this reciprocal process and *interrupting*

the cycle to restore the classroom microsystem to a positive state becomes clear. This study is an important first step in this identification, as it provides evidence that complex associations among teachers' psychological health, CLE, and student achievement exist. Furthermore, we conjecture that an "interruption" of this process might come in the form of mental health support systems implemented within schools coupled with professional development to improve teacher and classroom quality that together strive to help teachers achieve and sustain psychological well-being, build effective CLEs, and improve students' outcomes.

Pioneering studies have examined the effectiveness of such mental health interventions on teachers' classroom performance. Jennings, Snowberg, Coccia, and Greenberg (2011) successfully implemented a program based on their prosocial classroom theoretical model (Jennings & Greenberg, 2008) designed to reduce stress and improve performance in teachers, with positive results for teachers in high-stress settings. Additionally, Raver et al. (2008) found that preschool teachers were better able to foster positive classroom climates, had higher sensitivity to students' needs, and were more successful at managing behavior when they participated in an intervention that included weekly "coaching" by mental health consultants. Whereas these studies provide promising evidence that such programs have strong potential for positive change, most current models of professional development do not address issues surrounding psychological health (Roeser et al., 2012).

Teaching is one of the most stressful occupations in America (International Labour Office, 1993; Johnson et al., 2005), with emotional stress and poor emotion management being consistently identified as the primary reasons teachers leave their profession (Loeb, Darling-Hammond, & Luczak, 2005; Montgomery & Rupp, 2005). Managing students with behavior problems, working with difficult parents, and high-stakes performance evaluations are all examples of situations regularly faced by teachers that have strong potential to produce chronic stress that may leave teachers more vulnerable to depression. Additionally, the nature of the teaching profession leaves practitioners with very few opportunities for emotional self-regulation. Professionals in other areas can take a break when stressed, but a teacher must stay in the classroom with his or her students and continue teaching (Carson, Templin, & Weiss, 2006; Sutton, 2004), a less than optimal solution for both teacher and students. Conditions such as this may result in an occupational environment

that contributes to teachers' vulnerability to clinical ailments such as depression. In fact, Whitaker, Becker, Herman, and Gooze (2013) found that reports of poor mental health were more prevalent among female Head Start teachers compared to U.S. women with similar sociodemographic characteristics in other professions. This study provides foundational evidence for the high-risk nature of teaching as an occupation in relation with practitioners' emotional well-being. When these considerations are paired with strong evidence that teachers' psychological health is an important source of influence on a wide range of contributors to student development, such as classroom experience (Hamre & Pianta, 2004), behavior patterns (Jeon, Buettner, & Snyder, 2014), and cognitive/self-regulatory development (Ursache, Blair, & Raver, 2012), it becomes clear that mental health should be a higher priority within today's education system.

This study provides an important first step toward elucidating the roles that teachers' psychological characteristics play in shaping the learning context that impacts student development. Whereas much has been done examining the effects of maternal depression on child development, the impact of teachers' depression in the context of the classroom has yet to be fully defined. Related projects in the field examine depressive symptoms individually rather than as ongoing constellations of symptoms that indicate a larger problem. This project may be used as a guide for future research that investigates rates of depression among teachers compared to the general population, utilizes different student age groups, examines the roles of teacher support and professional development, and bases assessment of teachers' depression on clinical diagnosis.

Limitations

It is possible that the interventions applied in the longitudinal study could have played a role in our findings. Additionally, the small teacher sample limits this study's ability to detect effects, as well as its generalizability to the overall population. The fact that effects were indeed detected even given this small teacher sample is encouraging, however, and begs future research using more participants. Furthermore, due to concerns about teachers' sensitivity to filling out a formal clinical assessment, depression risk was based on self-reporting. The wording of some questions was changed and questions were mixed into a larger self-efficacy survey, which could have compromised the integrity of the target questions or primed participants to answer

differently than they otherwise might have. The use of a self-report measure was seen as an exploratory first step in this promising line of research, in lieu of diagnosis. We wanted to first establish whether there were meaningful associations among teachers' depressive symptoms, CLE, and student outcomes before progressing to the more involved steps of asking teachers about their status of clinical diagnosis. We plan to build on this methodology in future studies that incorporate formal diagnosis.

Conclusions

It is important to acknowledge the highly sensitive nature of this topic, especially considering the degree of scrutiny to which today's teachers are exposed through policy and evaluation, particularly in third-grade settings when high-stakes testing begins. It is in the spirit of understanding and support, not judgment or blame, that we hope to continue this line of research. Our long-term goal is to promote evidence-based recognition of the importance of teachers' mental health within schools. Knowledge gained in this area could not only inspire depressed teachers to seek the help they need, but could set in motion movement toward large-scale implementation of psychological support systems for America's educational practitioners. Such systems would provide benefits to those directly supported, as well as improve the educational experiences of students whose success is greatly influenced by the well-being of their teachers.

References

- Alliance for Excellent Education (2005). *Teacher attrition: A costly loss to the nation and to the states*. Washington, DC: Author.
- American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). Arlington, VA: Author.
- Baron, R. M., & Kenny, D. A. (1986). The moderator-mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology, 51*, 1173–1182. doi:10.1037/0022-3514.51.6.1173
- Beilock, S. L., Gunderson, E. A., Ramirez, G., & Levine, S. C. (2010). Female teachers' math anxiety affects girls' math achievement. *Proceedings of the National Academy of Sciences of the United States of America, 107*, 1860–1863. doi:10.1073/pnas.0910967107
- Bronfenbrenner, U., & Morris, P. A. (2006). The bioecological model of human development. In R. M. Lerner &

- W. Damon (Eds.), *Handbook of child psychology: Theoretical models of human development* (Vol. 1, 6th ed., pp. 793–828). Hoboken, NJ: Wiley.
- Carson, R. L., Templin, T. J., & Weiss, H. M. (2006). *Exploring the episodic nature of teachers' emotions and its relationship to teacher burnout*. Paper presented at the American Education Research Association annual convention, San Francisco, CA.
- Chang, M. (2009). An appraisal perspective of teacher burnout: Examining the emotional work of teachers. *Educational Psychology Review*, *21*, 193–218. doi:10.1007/s10648-009-9106-y
- Connor, C. M., Morrison, F. J., Fishman, B., Crowe, E. C., Al Otaiba, S., & Schatschneider, C. (2013). A longitudinal cluster-randomized control study on the accumulating effects of individualized literacy instruction on students' reading from 1st through 3rd grade. *Psychological Science*, *24*, 1408–1419. doi:10.1177/0956797612472204
- Connor, C. M. D., Morrison, F. J., Schatschneider, C., Toste, J., Lundblom, E. G., Crowe, E., & Fishman, B. (2011). Effective classroom instruction: Implications of child characteristic by instruction interactions on first graders' word reading achievement. *Journal of Research on Educational Effectiveness*, *4*, 173–207. doi:10.1080/19345747.2010.510179
- Connor, C. M., Ponitz, C. E. C., Phillips, B., Travis, Q. M., Day, S. G., & Morrison, F. J. (2010). First graders' literacy and self-regulation gains: The effect of individualizing instruction. *Journal of School Psychology*, *48*, 433–455. doi:10.1016/j.jsp.2010.06.003
- Connor, C. M., Spencer, M., Day, S. L., Giuliani, S., Ingebrand, S. W., & Morrison, F. J. (2014). Capturing the complexity: Content, type, and amount of instruction and quality of the classroom learning environment synergistically predict third graders' vocabulary and reading comprehension outcomes. *Journal of Educational Psychology*, *106*, 762–778. doi:10.1037/a0035921
- Eccles, J. S., & Roeser, R. (1999). School and community influences on human development. In M. H. Bornstein & M. E. Lamb (Eds.), *Developmental psychology: An advanced textbook* (4th ed., pp. 503–554). Mahwah, NJ: Erlbaum.
- Hamre, B. K., & Pianta, R. C. (2004). Self-reported depression in nonfamilial caregivers: Prevalence and associations with caregiver behavior in child-care settings. *Early Childhood Research Quarterly*, *19*, 297–318. doi:10.1016/j.ecresq.2004.04.006
- Hamre, B. K., & Pianta, R. C. (2005). Can instructional and emotional support in the first-grade classroom make a difference for children at risk of school failure? *Child Development*, *76*, 949–967. doi:10.1111/j.1467-8624.2005.00889.x
- Hamre, B. K., & Pianta, R. C. (2007). Learning opportunities in pre-school and early elementary classrooms. In Pianta, R. C., Cox, M. J., & Snow, K. L. (Eds.), *School readiness and the transition to kindergarten in the era of accountability* (pp. 49–84). Baltimore, MD: Brookes.
- Hamre, B. K., Pianta, R. C., Downer, J. T., & Mashburn, A. J. (2008). Teachers' perceptions of conflict with young students: Looking beyond problem behaviors. *Social Development*, *17*, 115–136. doi:10.1111/j.1467-9507.2007.00418.x
- International Labour Office. (1993). *World labour report 1993*. Geneva, Switzerland: Author.
- Jennings, P. A., & Greenberg, M. T. (2008). The prosocial classroom: Teacher social and emotional competence in relation to student and classroom outcomes. *Review of Educational Research*, *79*, 491–525. doi:10.3102/0034654308325693
- Jennings, P. A., Snowberg, K. E., Coccia, M. A., & Greenberg, M. T. (2011). Improving classroom learning environments by cultivating awareness and resilience in education (CARE): Results of two pilot studies. *Journal of Classroom Interaction*, *46*, 37–48. doi:10.1037/spq0000035
- Jeon, L., Buettner, C. K., & Snyder, A. R. (2014). Pathways from teacher depression and child-care quality to child behavioral problems. *Journal of Consulting and Clinical Psychology*, *82*, 225–235. doi:10.1037/a0035720
- Johnson, S., Cooper, C., Cartwright, S., Donald, I., Taylor, P., & Millet, C. (2005). The experience of work-related stress across occupations. *Journal of Managerial Psychology*, *20*, 178–187. doi:10.1108/02683940510579803
- Landis, J. R., & Koch, G. G. (1977). The measurement of observer agreement for categorical data. *Biometrics*, *33*, 159–174.
- La Paro, K. M., & Pianta, R. C. (2003). *CLASS: Classroom Assessment Scoring System*. Charlottesville: University of Virginia Press.
- Li-Grining, C., Raver, C. C., Champion, K., Sardin, L., Metzger, M. W., & Jones, S. M. (2010). Understanding and improving classroom emotional climate in the "real world": The role of teachers' psychosocial stressors. *Early Education and Development*, *21*, 65–94. doi:10.1080/10409280902783509
- Loeb, S., Darling-Hammond, L., & Luczak, J. (2005). How teaching conditions predict teacher turnover in California schools. *Peabody Journal of Education*, *80*, 44–70. doi:10.1207/s15327930pje8003_4
- MacGinitie, W. H., MacGinitie, R. K., Maria, K., & Dreyer, L. G. (2000). *Gates-MacGinitie Reading Tests*. Itasca, IL: Riverside.
- Mashburn, A. J., Hamre, B. K., Downer, J. T., & Pianta, R. C. (2006). Teacher and classroom characteristics associated with teachers' ratings of prekindergartners' relationships and behaviors. *Journal of Psychoeducational Assessment*, *24*, 367–380. doi:10.1177/0734282906290594
- Montgomery, C., & Rupp, A. (2005). A meta-analysis for exploring the diverse causes of effects of stress. *Canadian Journal of Education*, *28*, 458–486. doi:10.2307/2F4126479
- Murray, L., & Cooper, P. J. (1997). Effects of postnatal depression on infant development. *Archives of Disease in Childhood*, *77*, 99–101. doi:10.1136/adc.77.2.99
- National Institute of Mental Health. (n.d.). *Health topic: Depression*. Retrieved from www.nimh.gov.
- NICHD Early Child Care Research Network. (2007). Age of entry to kindergarten and children's academic and

- socioemotional development. *Early Education and Development*, 18, 337–368. doi:10.1080/10409280701283460
- Ochs, E. (1979). Transcription as theory. In E. Ochs & B. B. Schieffelin (Eds.), *Developmental pragmatics* (pp. 43–72). New York, NY: Academic Press.
- O'Connor, E., & McCartney, K. (2007). Examining teacher–child relationships and achievement as part of an ecological model of development. *American Educational Research Journal*, 44, 340–369. doi:10.3102/0002831207302172
- Pianta, R., Howes, C., Burchinal, M. R., Bryant, D., Clifford, R., Early, D., & Barbarin, O. (2005). Features of pre-kindergarten programs, classrooms, and teachers: Do they predict observed classroom quality and child–teacher interactions? *Applied Developmental Science*, 9, 144–159. doi:10.1207/s1532480xads0903_2
- Ponitz, C., Rimm-Kaufman, S. E., Grimm, K. J., & Curby, T. W. (2009). Kindergarten classroom quality, behavioral engagement, and reading achievement. *School Psychology Review*, 38, 102–120.
- Radloff, L. S. (1977). The CES-D Scale: A self-report depression scale for research in the general population. *Applied Psychological Measurement*, 1, 385–401.
- Raudenbush, S. W., & Bryk, A. S. (2002). *Hierarchical linear models: Applications and data analysis methods* (2nd ed.). Thousand Oaks, CA: Sage.
- Raver, C. C., Jones, S. M., Li-Grining, C. P., Metzger, M., Champion, K., & Sardin, L. (2008). Improving preschool classroom processes: Preliminary findings from a randomized trial implemented in Head Start settings. *Early Childhood Research Quarterly*, 23, 10–26. doi:10.1016/j.ecresq.2007.09.001
- Reynolds, A. J., & Ou, S. (2004). Alterable predictors of child well-being in the Chicago Longitudinal Study. *Children and Youth Services Review*, 26, 1–14. doi:10.1016/j.childyouth.2003.11.005
- Roeser, R. W., Skinner, E., Beers, J., & Jennings, P. A. (2012). Mindfulness training and teachers' professional development: An emerging area of research and practice. *Child Development Perspectives*, 6, 167–173. doi:10.1111/j.1750-8606.2012.00238
- Spira, E. G., Bracken, S. S., & Fischel, J. E. (2005). Predicting improvement after first-grade reading difficulties: The effects of oral language, emergent literacy, and behavior skills. *Developmental Psychology*, 41, 225–234. doi:10.1037/0012-1649.41.1.225
- Supplee, L. H., Shaw, D. S., Hailstones, K., & Hartman, K. (2004). Family and child influences on early academic and emotion regulatory behaviors. *Journal of School Psychology*, 42, 221–242. doi:10.1016/j.jsp.2004.02.001
- Sutton, R. E. (2004). Emotion regulation goals and strategies. *Social Psychology of Education*, 7, 379–398. doi:10.1007/s11218-004-4229-y
- Swartz, R. A., & McElwain, N. L. (2012). Preservice teachers' emotion-related regulation and cognition: Associations with teachers' responses to children's emotions in early childhood classrooms. *Early Education and Development*, 22, 202–226. doi:10.1080/10409289.2012.619392
- Ursache, A., Blair, C., & Raver, C. C. (2012). The promotion of self-regulation as a means of enhancing school readiness and early achievement in children at risk for school failure. *Child Development Perspectives*, 6, 122–128. doi:10.1111/j.1750-8606.2011.00209.x
- Vinson, B. (2001). A comparison of pre-service teachers' mathematics anxiety before and after a methods class emphasizing manipulatives. *Early Childhood Education Journal*, 29, 89–94. doi:10.1023/A:1012568711257
- Whitaker, R. C., Becker, B. D., Herman, A. N., & Gooze, R. A. (2013). The physical and mental health of Head Start staff: The Pennsylvania Head Start staff wellness survey. *Preventing Chronic Disease*, 10, 130–171. doi:10.5888/pcd10.130171
- Woodcock, R. W., McGrew, K. S., & Mather, N. (2001). *Woodcock–Johnson III Tests of Achievement*. Itasca, IL: Riverside.
- Yoshikawa, H., & Hsueh, J. A. (2001). Child development and public policy: Toward a dynamic systems perspective. *Child Development*, 72, 1887–1903. doi:10.1111/1467-8624.00384