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Publication Date

2018-08-01

DOI

10.1016/j.jsp.2018.05.002

Peer reviewed



Associations among teachers' depressive symptoms and students' classroom instructional experiences in third grade[☆]

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ARTICLE INFO

Action Editor: Jantine Spilt

Keywords:

Instruction
Elementary education
Teaching
Depression
Classroom observation

ABSTRACT

Recent studies have established connections among teachers' mental health and student outcomes, however there is limited understanding of how these teacher characteristics manifest in the classroom to affect students. The present study informed this gap by examining the associations among third grade teachers' ($N = 32$) self-reported symptoms of clinical depression and their students' ($N = 326$) classroom instructional experiences. Eight student experiences described by the Individualizing Student Instruction framework were investigated, including academic instruction facilitated by the teacher in various student groupings, students' independent and group work, teachers' planning/organizing instruction, and students' time off-task and in transitions. Multilevel modeling revealed negative associations between teachers' depressive symptoms and (a) teacher-facilitated academic instruction provided to the whole class and (b) teachers' planning/organizing instruction. Results suggest that teachers experiencing more symptoms may under-utilize instructional approaches that require more effort on their part. We discussed the implications of our findings for students' academic and social-emotional learning, and the potential benefits of incorporating mental health support components into teacher training and professional development aimed at improving instructional practices.

1. Introduction

Recent work has identified teachers' mental health as an important contributor to classroom processes and student outcomes (Roberts, LoCasale-Crouch, Hamre, & DeCoster, 2016; Sandilos et al., 2015). Teachers' depressive symptoms, in particular, have been explored in relation to classroom and student factors: McLean and Connor (2015) found that third-grade teachers who reported more depressive symptoms were more likely to have lower-quality classrooms (operationalized as a combination of classroom organization, instruction, and teacher management of/responsiveness to students). This association between teachers' depressive symptoms and classroom quality, in addition to research documenting links between classroom quality and students' classroom instructional experiences (Connor et al., 2014; Kane & Staiger, 2012; McLean, Sparapani, Toste, & Connor, 2016; Pianta, Paro, & Hamre, 2007) suggests that teachers' depressive symptoms might also influence the types and amounts of instruction that students experience in the classroom. Although the field has begun to identify associations among teachers' depressive symptoms and globally-observed aspects of the classroom environment (McLean & Connor, 2015; Roberts et al., 2016; Sandilos et al., 2015), little is known about the extent to which teachers' depressive symptoms influence individual students' exposures to various types of instruction within the classroom.

[☆] Funding for this project was provided by the U.S. Department of Education Institute of Education Sciences (R305H040013 and R305B070074) and the National Institute of Child Health and Human Development (R01HD48539, R21HD062834, and P50HD052120).

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Given the documented links between the instruction students receive and their developmental outcomes (Connor et al., 2010; McLean et al., 2016), such investigation may provide insight into how exactly teachers' mental health characteristics operate in the classroom to affect students.

We drew on the Bio-Ecological Model of Human Development (Bronfenbrenner & Morris, 2006) to frame this investigation. The Bio-Ecological Model highlights the importance of the proximal developmental contexts (in this case, the classroom) that children experience in contributing to their development. Additionally, this model illustrates the potential for the individual characteristics participants bring into a context (e.g., teachers' depressive symptoms) to contribute to the nature of that system's influence on others (e.g., the types and amounts of instruction students experience). Student-level classroom observation methods show promise in elucidating these potential relations as they portray classroom experiences from the vantage point of students in contrast to the classroom-level features captured by global observation methods. This is especially relevant in that students within the same classroom and between classrooms can have vastly different instructional experiences (Connor, Piasta, et al., 2009). However, very few studies to date have examined the influences of teachers' depressive symptoms on students' classroom experiences utilizing student-level observation methods. Importantly, one such investigation was recently undertaken which revealed relations among teachers' mental health characteristics and the academic feedback their students received (McLean & Connor, 2017). The McLean and Connor study provides a foundation upon which the present study expands, as we investigate how teachers' depressive symptoms relate to a wider range of instructional experiences.

The present study sought to address current gaps in the field by utilizing a student-level observational system to investigate whether the students of teachers reporting more depressive symptoms had systematically different classroom instructional experiences compared to students in classrooms led by teachers with fewer symptoms. We investigated students' experiences in literacy instruction exclusively because, according to a recent large-scale report, U.S. third-graders spend a larger percentage of time in literacy instruction than they do in any other subject (Hoyer & Sparks, 2017). This proportionately large amount of exposure to literacy instruction, considered alongside the potential for depressive symptoms to influence the nature of a teachers' interactions with students during classroom instruction (McLean & Connor, 2017), illustrates the value of investigating teachers' depressive symptoms within this domain of instruction. We anticipate results of this effort will inform teacher training and professional development programs and policies that aim to improve teachers' instructional practices, particularly in the context of literacy.

1.1. Teachers' depressive symptoms

Clinical depression, also known as Major Depressive Disorder, is recognized by the DSM-V as a mental disorder that has the potential to affect all aspects of a person's life including their professional performance. In general, this disorder is associated with a dampening of positive affect, energy, and motivation, with symptoms including prolonged feelings of fatigue and decreases in concentration, motivation, and engagement with others (American Psychiatric Association, 2013). Even the presence of depressive symptoms at non-clinical levels can negatively affect an individual, and is one of the strongest predictors of later major depressive episodes and other mental-health related struggles (Allen, Chango, Szwedlo, & Schad, 2014; Horwath, Johnson, Klerman, & Weissman, 1994). Recent work has highlighted the importance of conducting mental health research in teacher populations: Whitaker, Becker, Herman, and Gooze (2013) observed that reports of poor mental health were more prevalent among early childhood teachers relative to a comparable national sample, with 24% of teachers classified as at-risk for clinical depression compared to 18% in the general population. Given that teaching is one of the most stressful occupations (Johnson et al., 2005; Travers, 2001), it could be that the unique demands of the teaching profession leave its practitioners more prone to experiencing negative mental health symptoms.

We assessed a constellation of symptoms indicative of clinical depression utilizing an established measure of depression risk. Investigations into the contributions of depressive symptoms to teachers' classroom practices have revealed negative associations between symptoms (such as pervasive stress and feelings of burnout) and a teacher's ability to positively engage with, and provide high-quality instruction to, their students (Chang, 2009; Darr & Johns, 2008; McLean & Connor, 2017; Sandilos et al., 2015). For example, McLean and Connor (2017) recently reported that teachers who reported more depressive symptoms provided positive academic feedback less frequently to their students. In addition, depressive symptoms have been found to be negatively associated with teachers' monitoring and management of student behavior (Aloe, Amo, & Shanahan, 2014; Li Grining et al., 2010; Raver et al., 2008). Sandilos et al. (2015) further reported that preschool teachers' depressive symptoms were negatively associated with the observed quality of classroom-level instructional support and organization (elements of more general classroom quality). Lastly, Hamre and Pianta (2004) found that non-familial caregivers (i.e., preschool teachers and daycare workers) who reported more depressive symptoms were more withdrawn in their interactions with young children. Considering these findings along with the well-established negative effects of depressive symptoms on one's energy, motivation, and likeliness of engaging with others (APA, 2013) we hypothesized that teachers' depressive symptoms would influence the types of teacher-initiated and teacher-monitored instructional experiences their students have in the classroom.

1.2. Students' classroom instructional experiences

Students' instructional experiences in the classroom are robust correlates of achievement, highlighting the value of investigations which aim to identify novel predictors of those instructional experiences. Foundational associations between instructional experiences and achievement were highlighted in the seminal process-product research of the 1970s. Syntheses from this large body of research pinpointed multiple influential instructional experiences, including active teaching (i.e., instruction provided directly by the

teacher), classroom organization and management (e.g., good preparation of learning materials and activities, efficient transitions), cooperative learning (e.g., working in small groups or pairs), and time on-task (Brophy & Good, 1986; Brophy, 2006). Recent research has replicated and extended such findings. For example, instructional experiences including academic instruction facilitated by the teacher, efficient transitions between learning opportunities, and less time off-task have been linked to students' literacy achievement (Connor, Morrison, et al., 2009; Connor et al., 2010, 2013; McLean et al., 2016) and self-regulation (Connor et al., 2010).

Students' classroom instructional experiences were measured in the present study using the Individualizing Student Instruction framework (ISI; Connor et al., 2007). The ISI framework has been shown to be a valid and predictive tool for observing classroom instruction and making inferences about how types of instruction relate to student outcomes (Connor, Morrison, et al., 2009). Multiple studies have established connections among ISI-defined instructional experiences and well-validated measures of classroom quality (again operationalized as a combination of instruction, organization, and management of/responsiveness to students; Connor et al., 2014). Specifically, academic instruction provided directly by the teacher has found to be indicative of higher classroom quality (Connor et al., 2014). In addition, students' time in transitions and engaged in off-task behavior have been associated with classroom quality, with less student time off-task and decreasing time in transitions across the year indicative of higher-quality classrooms (McLean et al., 2016). Types of instruction defined by the ISI framework have also consistently been found to relate to student outcomes, including literacy achievement (Connor, Morrison, et al., 2009; Connor et al., 2010, 2013; McLean et al., 2016) and self-regulation (Connor et al., 2010). In the present study, we examined eight classroom instructional experiences captured by the ISI framework: Academic instruction provided by the teacher in whole class, small-group, and individual student groupings (three experiences), academic instruction managed by students independently in either small-group or individual student groupings (two experiences), planning/organizing instruction (i.e., instruction intended to support upcoming learning activities such as providing directions), students' time off-task, and students' time in transitions.

1.3. Teachers' depressive symptoms and students' instructional experiences

We anticipated that student's time spent in these instructional experiences would vary as a function of their teachers' depressive symptoms because we conceptualized these experiences as requiring varying levels of exertion from the teacher. Foundational work has described the variations in effort, engagement, and cognitive load required of teachers across different practices (Brophy & Good, 1986), and more recent work has identified more specifically that practices requiring teachers to think in real time and simultaneously monitor multiple aspects of the classroom environment are particularly demanding (Downer, Jamil, Maier, & Pianta, 2012). Indeed, this need to attend to the needs and behaviors of an entire classroom of students while also remembering and implementing a lesson plan has been reported by teachers themselves as overwhelming (Carre, 1993; Wideen, Mayer-Smith, & Moon, 1998). Feldon (2007) described in detail the important role that cognitive load plays in driving teacher practice and performance in the classroom, and others have similarly described how varying levels of cognitive load required of individuals are primary determinants of performance across multiple contexts, both professional and personal (Goldinger, Kleider, Azuma & Beike, 2003; Sweller, van Merriënboer, & Paas, 1998). Building on these foundational works, we conceptualized academic instruction provided directly by the teacher as requiring more teacher exertion, or cognitive load, compared to academic instruction where students are managing themselves without the direct involvement of the teacher (e.g., worksheets, silent reading). As such, we anticipated that students of teachers experiencing more depressive symptoms would experience less teacher-facilitated academic instruction and, alternately, more academic instruction where they are expected to work independently. We further anticipated that different groupings of students (whole-class, small-group, individual) may also represent different amounts of effort required of the teacher. For academic instruction provided directly by the teacher, we posited that a whole-class grouping might require the most teacher effort as the teacher must deliver academic information while simultaneously monitoring and managing the behavior of a large group of students. As such, we anticipated that the students of teachers with more depressive symptoms would experience less teacher-facilitated academic instruction in a whole-group setting and more teacher-facilitated academic instruction in small-group or individual settings. Alternately, students working with peers without the direct involvement of the teacher are arguably more at risk of becoming distracted and off-task compared to a student working independently, potentially leading to this type of instruction requiring more effort from the teacher in terms of monitoring the group from a distance. Based on this, we predicted that students of teachers with more symptoms would experience less time in student-managed instruction where they are working alongside peers, and more time in student-managed instruction where they are working independently.

Regarding the remaining types of instructional experiences investigated (planning/organizing, time off-task, and time in transitions), findings that teachers' depressive symptoms are predictive of classroom-level organization (Sandilos et al., 2015) provide initial evidence for our hypothesis that students would experience less planning/organizing instruction when in classrooms with teachers reporting more symptoms. We also considered student time spent off-task and in transitions. The teacher's role in these activities is more passive compared to the provision of direct instruction; however in these cases the teacher is responsible for monitoring students throughout the day and redirecting students who disengage from learning activities or who do not transition between activities efficiently. Past findings suggest that teachers' stress and challenges with emotion regulation impede their abilities to effectively monitor students and manage behavior (Li Grining et al., 2010; Raver et al., 2008). Further, correlates of clinical depression such as emotional exhaustion and diminished sense of personal accomplishment are associated with lower levels of

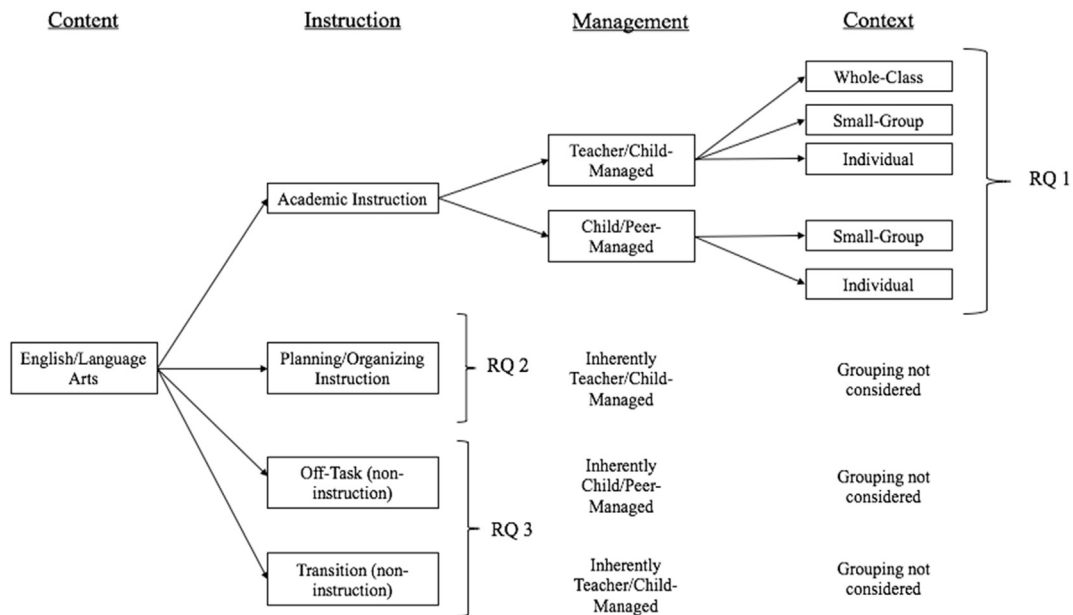


Fig. 1. Graphic representation of the ISI system dimensions for each of the eight classroom instructional experiences.

teachers' efficacy in classroom management (Aloe et al., 2014). Building from these established patterns, we anticipated that the students of teachers reporting more depressive symptoms would spend more time both off-task and in transitions between activities.

1.4. Study aims

The goal of this study was to provide a more complete understanding of how teachers' depressive symptoms influence the instructional context of the classroom. Toward this goal, we examined the following three research questions (see Fig. 1): First (RQ 1), what are the relations between teachers' self-reported depressive symptoms and the amounts of time their students spend in five types of academic instruction, including teacher-facilitated academic instruction in whole-class, small-group and individual groupings and students' independent work in small-group and individual groupings? Second (RQ 2), how are teachers' self-reported depressive symptoms related to the amounts of time students spend exposed to planning/organizing instruction? Last, (RQ 3), how are teachers' self-reported depressive symptoms related to the amounts of time students spend off-task and in transition?

2. Methods

2.1. Participants

Five hundred and twenty three third grade students and their 32 teachers from eight schools in a North Florida school district were recruited to participate in a large longitudinal study investigating the influence of various teacher instructional practices on student learning. From this full sample, 8 to 12 students per classroom were randomly selected from strata categorized by fall academic achievement (low, average, and high-achieving students) to be observed for classroom instructional experiences using the ISI framework, resulting in an analytic sample for the present study of 326 students and 32 teachers. Of the students in the analytic sample, 72% were Caucasian, 6% were African American, 4% were Asian, 3% were Hispanic/Latino, and the remaining 15% reported other ethnicities such as Native American or Multiracial. Students ranged in age from 7.5 to 10 years and most students were 8 years old at the first time point (mean = 7.99 years, SD = 0.59 years). Approximately half of students qualified for the U.S. Free and Reduced Lunch (FARL) program, an indicator of family socioeconomic status (SES). These demographics closely matched what was observed in the full student sample. All teachers met state certification requirements and all attained at least a bachelor's degree in education. Teaching experience ranged from zero to 31 years, with a mean of 11 years (SD = 13 years). All but two teachers were female, and approximately 92% of teachers were Caucasian. Schools reflected a wide range of SES, as indicated by the percentage of students within the school enrolled in the FARL program (range = 4% to 92%).

2.2. Procedures

Students and teachers were recruited to participate in the longitudinal study in the summer prior to, and the early fall of, the academic year. Data were collected at three time points throughout the year: once each in the fall (late September), winter (early December) and spring (late March). Observations of students' classroom instructional experiences were conducted using whole-day video recordings captured at each of these time points. Teachers self-reported on their depressive symptoms at one time point, in the winter.

Confidentiality procedures were explained to all teachers and guardians of student participants including the de-identification of data and IRB protocols regarding data sharing. Specifically, participants were informed that their names would not be linked to their responses on measures or their images in observations, and data would never be shared with or viewed by anyone outside of the investigative team. Additionally, all potential risks and benefits of participating in the study were fully disclosed. Participants were not informed of the specific purpose of the larger longitudinal study or the present study, but were told generally that the information collected would help investigators learn more about teachers' and students' experiences in elementary classrooms. Teachers were asked to report on their depressive symptoms with as much accuracy as possible and were able to privately complete surveys to encourage unbiased responses.

2.3. Measures

2.3.1. Students' classroom instructional experiences

Whole-day video recordings of classroom instruction were conducted for each classroom in the fall, winter, and spring. Each video observation captured all instruction that took place throughout the day including the designated blocks of instruction that took place for each content area as required by the state implemented curriculum at the time. State curricula required teachers to designate at least 120 min of every day to literacy instruction, providing a level of consistency across classrooms in the time spent in literacy instruction. Across all observations, the large majority of literacy instruction blocks took place in the morning. Constraining the content-area to literacy strengthens the internal validity of study findings by holding constant the subject matter observed and thus eliminating subject matter as a potential confound.

During taping, up to two trained videographers simultaneously managed two cameras, with one camera capturing a wide view of the classroom and the other capturing a closer view of the teacher and nearby students. Videographers wrote detailed physical descriptions of each child in the classroom and took written notes of all activities taking place to be used later by video coders as additional reference material. The whole-day observations were split by content area (literacy, math, science, etc.) for individual coding. For the present study, trained research assistants coded the designated literacy block of each video observation using the ISI framework in Noldus Observer® Video-Pro Software.

The ISI framework is a student-level instructional tracking system that provides an in-depth view of how individual students spend their time in the classroom. Specifically, the ISI framework as applied in the present study considers students' classroom instructional experiences across four dimensions: *content*, *instruction*, *management*, and *context*. The *content* dimension denotes which content-area students are receiving instruction in (literacy, math, science). The *instruction* dimension refers to the type of instruction (or non-instruction) the students are experiencing. The third dimension, *management*, refers to whom in the situation (the teacher or the student/students) is primarily responsible for directing the activity. Lastly, the *context* dimension refers to the grouping of students within an activity relative to the teacher and their peers. The ISI framework tracks the duration of each target student's participation in all observable classroom activities lasting 15 s or longer. Each activity is assigned codes across the four dimensions.

The current study investigates eight student classroom instructional experiences defined by these four dimensions (Fig. 1). Regarding the *content* dimension, all instructional experiences investigated in the present study received content codes for "literacy/language arts" as this was the only content area observed. Student experiences were then categorized by type of instruction in the *instruction* dimension. Within this dimension, we focus on three broader categories of instruction: academic instruction, planning/organizing instruction, and non-instructional activities. The *management* dimension of the ISI framework further defines all academic instruction as either Teacher/Child-Managed (TCM) or Child/Peer-Managed (CPM). TCM academic instruction indicates that the activity is under the direct management of the teacher (e.g., the teacher guiding a group of students through a reading comprehension activity). Alternately, CPM academic instruction indicates that a student or group of students are regulating their learning independently either alone or within a group of peers without the direct involvement of the teacher (e.g., a student working independently on a worksheet or a group of students making an idea web). Within TCM and CPM academic instruction, the *context* dimension further delineates student groupings in relation to the teacher and each other, and includes whole-class (WC), small-group (SG), and individual (IND) groupings. WC indicates that all students in the classroom are participating in a single activity and are oriented toward the teacher (as such, WC is inherently TCM). SG describes a situation in which two or more students, but not all students in the classroom, are engaged in an activity together and can be either TCM or CPM. IND describes a child working independently without other students and can also be either TCM or CPM.

In addition to these various types of academic instruction, planning/organizing instruction and students' participation in non-instructional activities are also considered. Teachers' planning/organizing instruction is defined as instruction that is not directly academic in nature but that supports future academic learning. Examples of this include a teacher's purposeful attempts to create and maintain classroom rules and routines, orient students to new activities, and organize the structure of learning opportunities. Regarding non-instructional activities, students' time spent off-task and transitioning between activities are both considered. Time spent off-task encompasses student engagement in any behavior or activity that is not the intended focus of the learning opportunity at hand, but excludes teacher-sanctioned deviations from a learning activity such as trips to the bathroom. Time spent transitioning includes teacher-sanctioned movement between instructional activities. Planning/organizing instruction and the two non-instructional experiences are not further described by the *management* dimension in the ISI framework as planning/organizing instruction and participation in transitions are inherently TCM (initiated and/or supervised by the teacher) and time off-task is inherently CPM. Although captured by the ISI framework, context (student grouping) within planning/organizing instruction and the two non-instructional experiences was not considered in the present study, as there was not enough variation within these categories to yield reliable subcategories. Specifically, most planning/organizing instruction and transitions took place in a WC context, while the majority of students' time off-task took place in an IND context. In summary, the eight instructional experiences investigated in the present study are 1) academic TCM-WC instruction, 2) academic TCM-SG instruction, 3) academic TCM-IND instruction, 4) academic CPM-SG instruction, 5) academic CPM-IND instruction, 6) planning/organizing, 7) time off-task, and 8) time in transitions.

Initial training of ISI coders consisted of approximately three weeks of in-depth group discussion and application of the ISI framework to video data not analyzed in the present study, led by the project PI and project manager. This initial training was followed by independent coding of three reliability videos by each of the six members of the coding team to establish inter-rater reliability (IRR). IRR was calculated using Cohen's kappa which captured the extent of agreement (i.e., match) on both the assessments of student instructional experiences using the four ISI dimensions and the duration of each experience recorded. Kappa was used because it takes into account matches that may be a result of chance whereas relying on simple percent agreement among raters may inflate reliability estimates (McHugh, 2012). In general, a kappa > 0.60 indicates acceptable inter-rater reliability. The ISI coding team achieved a minimum kappa score of 0.76 across the three reliability videos when considering all possible ISI codes and a minimum of 0.98 when considering only those codes utilized in the present study. When each of the eight target experiences was assessed individually, kappas ranged from 0.97 to 0.99. Throughout the duration of video coding, the coding team completed twice-yearly IRR assessments following these same procedures and maintained kappa levels of 0.75 or higher for the full ISI framework.

2.3.2. Teachers' depressive symptoms

Teachers completed an adapted version of the Center for Epidemiologic Studies Depression Scale (CES-D; Radloff, 1977; alpha = 0.85 for original version) in the winter of the academic year. The original CES-D scale includes 20 questions that ask subjects to report on a scale of 1 (*rarely or none of the time*) to 3 (*most or all of the time*) the frequency with which they have experienced common symptoms of clinical depression in the past week of their lives. Scores on the original version range from 1 to 60 with a total of 16 or higher indicating risk of clinical depression. The adapted version used in the present study included 18 of these 20 questions incorporated into a larger survey about teachers' work experiences and job satisfaction. Questions targeting depressive symptoms asked teachers to report how often they felt each statement was true of themselves in general, without assigning a specific time period to reflect on. Questions were changed from past to present tense, and two questions ("I feel I am just as good as other people" and "I think my life has been a failure") were excluded at the request of district administration. The Likert scale for this adapted version was increased from 3 points to 5 points to capture more nuanced levels of depressive symptoms, with a 1 indicating *never true of myself* and 5 indicating *always true of myself*. Total scores among the teacher sample ranged from 22 to 62, with a mean score of 36 and a standard deviation of 9. Importantly, this measure is used in the present study as a general evaluation of the presence or absence of depressive symptoms, and not as a formal measure of clinical depression. As such, the recommended clinical cutoffs of the original CES-D scale are not considered. This adapted measure displayed adequate reliability within the analytic sample of alpha = 0.75.

2.3.3. Covariates

Teachers reported their years of teaching experience and parents/guardians of student participants reported their child's gender and FARL enrollment status in demographic surveys prior to the fall data collection time point.

2.4. Analytic approach

The total number of minutes students spent in each type of instruction across the three time points were averaged for each of the eight instruction variables, and standardized scores (z-scores) were calculated from these averages for use in analyses. The majority of students were present and coded across all three observations, however in the case that a student was missing data on one or two of the three time points, average scores were calculated based on the available data. Teachers' total scores on the adapted CES-D measure were grand-mean centered for analyses. Covariates were not transformed; teachers' years of experience remained a total

score, students' FEARL status was coded as 0 = *never applied for FEARL*, 1 = *applied for FEARL but not enrolled*, 2 = *enrolled in FEARL*, and student gender was coded as 0 = *male*, 1 = *female*.

First, we examined descriptive statistics and bivariate correlations to investigate distributional assumptions and zero-order correlations between teachers' depressive symptoms and students' average time in each of the target classroom experiences across the year. Multilevel modeling conducted in the statistical computing program MPlus (version 7; Muthén & Muthén, 2012) was then used to investigate each of the research questions. A multileveled approach was deemed most appropriate given the nested nature of the data, with students nested in classrooms. Thus, two-level random intercept models (one for each outcome) were estimated to account for variance in the outcome variables attributable to differences between individual students (level 1) and differences between classrooms (level 2). We used a model-building approach to inform the amount of variance in each outcome explained by teachers' depressive symptoms beyond that explained by model covariates at each level. In this approach, we first tested an unconditional model for each outcome to ascertain intra-class correlation (ICC) estimates of the total amount of variance attributable to between-classroom differences in the outcome. Next, we tested a covariate model for each outcome, which included students' FEARL status and gender as fixed effects at level-1 and teachers' years of teaching experience at level-2 to determine the amount of variance in the outcome explained by the covariates at each level. At this stage, random-slope models in which the effects of FEARL status and gender were allowed to vary across level-2 clusters [i.e., classrooms] were run in order to verify that covariates were best treated as fixed effects however these models did not converge, likely due to the small level-2 sample size. However, students in participating schools were not assigned to classrooms based on SES or gender characteristics (i.e., classrooms were not purposefully created to have more/fewer boys or girls, or more/fewer students of certain SES), and so it stands to reason that variation in these variables likely lies primarily between students. As such, all models reported treat these covariates as fixed effects. Last, we tested a focal model for each outcome, which added teachers' depressive symptoms as the predictor of interest to test statistical significance and the amount of variance in the outcome explained by teachers' depressive symptoms above the effects of the covariates. At each step, any model revealing significant effects was compared to the corresponding prior model to ascertain the proportion of reduction in variance at each level. We calculated the proportions of reduction in unexplained variance by dividing the residual variance in the full model by the residual variance in the initial model and subtracting the resulting quotient from 1. These calculations are reported separately for level-1 and level-2 in each model.

All models were run using a maximum likelihood estimator (MLR) which produces standard errors robust to the non-normality of dependent variables as was the case with some of our instruction outcome variables (see Descriptive Statistics and Correlations). As the focal models were just identified, traditional model fit indices (Comparative Fit Index, Standardized Root Mean Square Residual, Chi-Square test) would not provide meaningful information and so were omitted. The significance/magnitude of model results were determined based on *p*-values and pseudo *r*-squared estimates (estimates of the proportions of reduction in unexplained variance attributable to independent variables).

There were small amounts of missing student-level data, and five of the 32 teachers did not complete the winter survey (which included CES-D questions) due to either prolonged holiday-related absences or unresponsiveness despite investigator reminders. Correlations among patterns of missingness and primary variables were consistently non-significant, providing evidence that these data were missing at random. In order to account for missing data, especially at the teacher level, all models applied Full Information Maximum Likelihood (FIML) estimation, which retains the power of the full analytic sample and minimizes bias in parameter estimates (Enders, 2010).

Table 1
Descriptive statistics for all study variables.

	<i>N</i>	Min	Max	Mean	<i>SD</i>	Skewness	Kurtosis
CES-D	27	22	62	25.61	9.04	1.13	1.25
TCM-WC	321	2.26	66.20	20.23	14.62	1.16	1.21
TCM-SG	321	0	40	7.52	7.31	2.03	4.98
TCM-IND	321	0	4.96	0.29	0.73	3.29	11.62
CPM-SG	321	0	21.63	2.64	4.06	1.98	3.61
CPM-IND	321	1.29	119.96	37.11	23.55	0.76	0.59
Pl./Org.	321	0.14	81.35	13.48	14.05	2.96	10.54
Off-Task	321	0	41.46	1.75	3.4	5.8	57.94
Transition	321	1.70	63.07	20.42	11.10	0.87	1.18

Note. CES-D = Center for Epidemiological Studies Depression Scale, TCM-WC = Teacher/child-managed-Whole class; TCM-SG = Teacher/child-managed-Small group; TCM-IND = Teacher/child-managed-Individual; CPM-SG; Child/peer-managed-Small group; CPM-IND = Child/peer-managed-Individual.

Table 2
Correlations among teachers' depressive symptoms and students' classroom instructional experiences.

	1	2	3	4	5	6	7	8	9	10	11	12
1. CES-D	1											
2. T. yrs. exp.	-0.12	1										
3. S. SES	0.13	0.08	1									
4. S. gender	0.05	0.03	-0.05	1								
5. TCM-WC	-0.31**	0.24**	-0.23**	0.07	1							
6. TCM-SG	-0.04	0.01	0.06	-0.08	-0.13*	1						
8. TCM-IND	0.06	0.03	-0.01	-0.04	-0.13*	0.23**	1					
9. CM-SG	0.01	-0.18*	0.03	-0.01	-0.04	0.01	-0.07	1				
10. CM-IND	0.07	0.25**	-0.03	0.09	0.25**	0.06	0.06	-0.14*	1			
11. Plan/org.	-0.43**	0.29**	-0.06	0.03	0.72**	-0.01	-0.05	0.17**	0.20**	1		
12. Transitions	-0.04	-0.06	-0.19**	0.08	0.50**	0.14*	0.04	-0.12*	0.52**	0.15**	1	
13. Off-task	0.15**	0.07	0.13*	-0.10	-0.03	0.08	0.08	0.08	0.13*	-0.09	-0.02	1

Note. CES-D = Center for Epidemiological Studies Depression Scale, TCM-WC = Teacher/child-managed-Whole class; TCM-SG = Teacher/child-managed-Small group; TCM-IND = Teacher/child-managed-Individual; CPM-SG; Child/peer-managed-Small group; CPM-IND = Child/peer-managed-Individual.

* $p < 0.05$; ** $p < 0.01$.

3. Results

3.1. Descriptive statistics and correlations

Descriptive statistics for all study variables are provided in Table 1. Teachers' total scores on the adapted CES-D and students' average number of minutes in each type of instruction across the three time points are reported. Students generally spent more time in academic instruction (TCM and CPM) than in planning/organizing or non-instructional activities and slightly more time in CPM than in TCM academic instruction. Within TCM academic instruction, students spent the most time in academic TCM-WC instruction and the least time in TCM-IND. Within CPM academic instruction, students spent more time in CPM-IND than in CPM-SG. Further, students generally spent more time in planning/organizing than they did in either of the non-instructional activities, and they were observed to spend relatively little time off-task. Important to note, the ranges observed across all classroom experiences indicated great variability in the amounts of time students spent in each. Non-normal distributions were detected for some classroom experience variables, justifying the use of a more robust estimation method in analyses. Regarding depressive symptoms, teachers generally reported low levels of symptoms; however, there was considerable variation among teachers.

Bivariate correlations (see Table 2) revealed the associations among teachers' depressive symptoms, study covariates, and students' time in each classroom instructional experience. Depressive symptoms showed moderately-sized negative relations with TCM-WC and planning/organizing, as well as a small positive relation with students' time off-task. Teachers' years of experience showed small positive correlations with TCM-WC, CM-IND, and planning/organizing instruction, as well as a small negative correlation with CM-SG instruction. Students' SES (with higher values indicating lower SES) showed small negative correlations with TCM-WC instruction and transitions, as well as a small positive correlation with students' time off-task. Student gender (0 = male, 1 = female) showed no significant relation to any of the target instructional experiences. Notably, a large correlation was detected between TCM-WC and planning/organizing instruction, and moderately-sized correlations were detected between TCM-WC and transitions, and between CM-SG and transitions.

3.2. RQ 1: academic instruction

3.2.1. TCM-WC

All multilevel modeling results are reported in Table 3. The unconditional model for TCM-WC instruction revealed a level-2 ICC of 0.84, indicating that 84% of the variance in this variable was due to classroom-level differences. The covariate model, which introduced students' SES and gender and teachers' years of experience as predictors of TCM-WC instruction, revealed a marginally significant negative effect of SES ($\beta = -0.06, p = 0.06$). No effects for student gender or teacher years of experience on WC-TCM instruction were detected. The proportion of reduction in unexplained variance attributable to the addition of covariates (compared to the unconditional model) was 0.03 or 3% at level-1, and was 0.08 or 8% at level-2. The final focal model, which included teachers' depressive symptoms as a predictor, revealed a significant effect of depressive symptoms on WC-TCM instruction ($\beta = -0.04, p = 0.01$) such that students in classrooms with teachers reporting more symptoms experienced less of this type of instruction. The

proportion of reduction in unexplained variance attributable to the addition of teachers' depressive symptoms (compared to the covariate model) was 0 at level-1 and 0.15 or 15% at level-2.

3.2.2. TCM-SG

The unconditional model for TCM-SG instruction revealed a level-2 ICC of 0.39, indicating that 39% of the variance in this variable was due to classroom-level differences. The covariate model revealed no significant effects of student SES, gender, or teacher years of experience on the amount of TCM-SG instruction students experienced. The final focal model revealed no significant effect of depressive symptoms on the amount of TCM-SG instruction students experienced.

3.2.3. TCM-IND

The unconditional model for TCM-IND instruction revealed a level-2 ICC of 0.12, indicating that 12% of the variance in this variable was due to classroom-level differences. The covariate model revealed no significant effects of student SES, gender, or teacher years of experience on the amount of TCM-IND instruction students experienced. The final focal model revealed no significant effect of depressive symptoms on the amount of TCM-IND instruction students experienced.

3.2.4. CPM-SG

The unconditional model for CPM-SG instruction revealed a level-2 ICC of 0.68, indicating that 68% of the variance in this variable was due to classroom-level differences. The covariate model revealed no significant effects of student SES or gender on the amount of CPM-SG instruction students experienced, but did reveal a significant effect of teachers' years of experience ($\beta = -0.02$, $p = 0.02$). The proportion of reduction in unexplained variance attributable to the addition of covariates was 0 at level-1 and was 0.13 or 13% at level-2. The final focal model revealed no significant effect of depressive symptoms on the amount of CPM-SG instruction students experienced.

3.2.5. CPM-IND

The unconditional model for CPM-IND instruction revealed a level-2 ICC of 0.75, indicating that 75% of the variance in this variable was due to classroom-level differences. The covariate model revealed no significant effects of student SES or teacher years of experience on the amount of CPM-IND instruction students experienced, but did reveal a significant effect of student gender ($\beta = 0.14$, $p = 0.03$). The proportion of reduction in unexplained variance attributable to the addition of covariates was 0.04 or 4% at level-1 and 0.10 or 10% at level-2. The final focal model revealed no significant effect of depressive symptoms on the amount of CPM-IND instruction students experienced.

3.3. RQ 2: planning/organizing instruction

The unconditional model for planning/organizing instruction revealed a level-2 ICC of 0.87, indicating that 87% of the variance in this variable was due to classroom-level differences. The covariate model revealed no significant effects of student SES, gender, or teacher years of experience on the amount of planning/organizing instruction students experienced. The final focal model revealed a significant effect of depressive symptoms planning/organizing instruction ($\beta = -0.05$, $p = 0.001$) such that students in classrooms with teachers reporting more symptoms experienced less of this type of instruction. The proportion of reduction in unexplained variance attributable to the addition of teachers' depressive symptoms (compared to the covariate model) was 0 at level-1 and 0.63 or 63% at level-2.

3.4. RQ 3: non-instructional activities

3.4.1. Transitions

The unconditional model for Transitions revealed a level-2 ICC of 0.68, indicating that 68% of the variance in this variable was due to classroom-level differences. The covariate model revealed no significant effects of student SES, gender, or teacher years of experience on students' time spent in transitions. The final focal model revealed no significant effect of depressive symptoms on students' time spent in transitions.

3.4.2. Off-task behavior

The unconditional model for TCM-WC instruction revealed a level-2 ICC of 0.17, indicating that 17% of the variance in this variable was due to classroom-level differences. The covariate model revealed no significant effects of student SES, gender, or teacher years of experience on students' off-task behavior. The final focal model revealed no significant effect of depressive symptoms on students' off-task behavior.

Table 3
Model estimates, covariate and focal models for each classroom instructional experience.

Students' classroom instructional experiences															
TCM-WC				TCM-SG				TCM-IND				CPM-SG			
Covariate model		Focal model		Covariate model		Focal model		Covariate model		Focal model		Covariate model		Focal model	
Unstd. coeff. (SE)	Std. Coef.	Unstd. coeff. (SE)	Std. Coef.	Unstd. coeff. (SE)	Std. Coef.	Unstd. coeff. (SE)	Std. Coef.	Unstd. coeff. (SE)	Std. Coef.	Unstd. coeff. (SE)	Std. Coef.	Unstd. coeff. (SE)	Std. Coef.	Unstd. coeff. (SE)	Std. Coef.
Student-level															
Gender (0 = male)	0.07 (0.05)	0.09	0.07 (0.05)	0.09	-0.19 (0.11)	-0.12	-0.19 (0.11)	-0.12	-0.11 (0.14)	-0.06	-0.11 (0.14)	-0.06	0.05 (0.06)	0.04	0.04
FARL status	-0.06 (0.03)	-0.14	-0.06 (0.03)	-0.14	0.03 (0.07)	0.04	0.03 (0.07)	0.04	-0.03 (0.08)	-0.03	-0.03 (0.08)	-0.03	-0.03 (0.04)	-0.04	-0.04
	$R^2 = 0.03$		$R^2 = 0.03$		$R^2 = 0.02$		$R^2 = 0.02$		$R^2 = 0.004$		$R^2 = 0.004$		$R^2 = 0.004$		$R^2 = 0.004$
Teacher-level	0.02 (0.01)	0.23	0.01 (0.01)	0.18	0.004 (0.01)	0.09	0.004 (0.01)	0.08	0.003 (0.01)	0.12	0.004 (0.01)	0.13	-0.02 (0.01)	-0.37	-0.03* (0.01)
Years of experience	-	-	-0.04*	-0.41	-	-	-0.01 (0.02)	-0.08	-	-	0.01 (0.01)	0.18	-	-	-0.01 (0.02)
Depressive symptoms	$R^2 = 0.05$		$R^2 = 0.20$		$R^2 = 0.01$		$R^2 = 0.01$		$R^2 = 0.01$		$R^2 = 0.05$		$R^2 = 0.14$		$R^2 = 0.15$
CPM-IND															
Student-level	0.14*	(0.06)	0.14	0.14*	(0.06)	0.14	0.02 (0.04)	0.03	0.10 (0.07)	0.09	0.10 (0.07)	0.09	-0.17 (0.13)	-0.10	-0.18 (0.14)
Gender (0 = male)	-0.01 (0.05)	-0.02	-0.01 (0.05)	-0.02	0.002 (0.02)	0.01	0.004 (0.02)	0.01	-0.01 (0.04)	-0.01	-0.01 (0.04)	-0.01	0.14 (0.10)	0.13	0.13 (0.09)
FARL status	$R^2 = 0.02$		$R^2 = 0.02$		$R^2 = 0.001$		$R^2 = 0.001$		$R^2 = 0.01$		$R^2 = 0.01$		$R^2 = 0.03$		$R^2 = 0.03$
Teacher-level	0.02 (0.02)	0.30	0.02 (0.02)	0.30	0.02 (0.01)	0.24	0.01 (0.01)	0.17	-0.001 (0.01)	-0.02	-0.002 (0.01)	-0.03	0.01 (0.01)	0.17	0.01 (0.01)
Years of experience	-	-	0.01 (0.02)	0.10	-	-	-0.05** (0.02)	0.81	-	-	-0.01 (0.01)	-0.08	-	-	0.01 (0.01)
Depressive symptoms	$R^2 = 0.09$		$R^2 = 0.10$		$R^2 = 0.06$		$R^2 = 0.69$		$R^2 < 0.001$		$R^2 = 0.01$		$R^2 = 0.03$		$R^2 = 0.12$

Note. TCM-WC = Teacher/child-managed-Whole class; TCM-SG = Teacher/child-managed-Small group; TCM-IND = Teacher/child-managed-Individual; CPM-SG; Child/peer-managed-Small group; CPM-IND = Child/peer-managed-Individual.

Note. Pseudo R-squared estimates for covariate models obtained by comparing each covariate model to its corresponding unconditional model. Pseudo r-squared estimates for focal models obtained by comparing each focal model to its corresponding covariate model.

* $p < 0.05$; ** $p < 0.01$.

4. Discussion

The present study extends current research that has observed negative associations between teachers' depressive symptoms and globally observed classroom factors by focusing more acutely on differences in students' classroom instructional experiences, assessed at the student level, as a function of their teachers' depressive symptoms. We were interested in eight classroom instructional experiences that we conceptualized to reflect varying levels of teacher effort and engagement, including five types of academic instruction (teacher-facilitated academic instruction in whole-class, small-group, and individual student groupings, and students' independent work in small-group and individual groupings), planning/organizing instruction, and two non-instructional activities (time off-task and transitioning). This study is one of the first to utilize student-level observation methods to investigate how teachers' depressive symptoms operate in the classroom, and is the first to consider such a diverse set of classroom instructional experiences. Partially in support of our hypotheses, teachers' depressive symptoms were related to less time spent by students in teacher-facilitated whole class academic instruction and planning/organizing instruction, but did not relate to the amount of time students spent in the other instructional experiences investigated. Following, we discuss these findings in detail and highlight their potential implications for student outcomes and teacher professional development.

4.1. Teacher-facilitated academic instruction

Students of teachers reporting more depressive symptoms experienced less teacher-facilitated academic instruction in a whole-class grouping, however no effects of depressive symptoms on teacher-facilitated academic instruction in small-group or individual groupings, nor on either type of instruction where students worked independently were detected. Academic instruction that is facilitated directly by the teacher requires active involvement on the part of the teacher and within this, instruction in a whole-class grouping may require the most teacher effort due to the added task of monitoring and managing the behavior of a large group of students. The findings of the present study suggest that teachers experiencing more depressive symptoms may utilize this type of instruction less, perhaps as a result of the decreased energy and motivation typical of clinical depression. This is supported by research documenting that indicators of burnout (which are strong correlates of clinical depression) are associated with lower levels of teachers' efficacy in classroom management (Aloe et al., 2014). Additionally, researchers have reported that teacher practices such as thinking in real time and simultaneously attending to multiple aspects of the classroom environment require quite a bit of cognitive processing (Downer et al., 2012). As such, it could be that a teacher applying academic instruction to the whole class would need to utilize these skills, and a teacher with more depressive symptoms may be less able to do so with success.

4.2. Planning/organizing instruction

Additionally, students of teachers reporting more symptoms experienced less planning/organizing instruction. This finding is in line with a recent study reporting a negative association between teachers' depressive symptoms and globally-observed classroom organization in early childhood classrooms (Sandilos et al., 2015). Like teacher-facilitated academic instruction, planning/organizing instruction requires active involvement on the part of the teacher in terms of simultaneously instructing and managing student behavior, and the similar association detected between depressive symptoms and student time in this type of instruction could again be due to the dampening effect of depression on an individual's energy, motivation and likelihood of engagement. Unlike teacher-facilitated academic instruction, however, the effect size of depressive symptoms on planning/organizing was particularly large. This may suggest that while both teacher-facilitated academic instruction and planning/organizing instruction relate to teachers' depressive symptoms in similar ways, there may be something unique about planning/organizing instruction that makes it especially vulnerable to teachers' depressive symptoms. The use of more planning/organizing instruction by a teacher could indicate that the teacher regularly plans academic activities that are complex enough to warrant a formal explanation to students, and has allocated class time specifically for this purpose. As such, we attest that more planning/organizing instruction may be an indicator of a teacher who spends more time engaged in proactive, purposeful planning of classroom activities (likely outside of the classroom) and who implements classroom activities that are potentially more complex. It would stand to reason that the dampening effect of depressive symptoms might have a particular impact on a teacher's ability to partake in these elements of preparation and instruction, thus resulting in less planning/organizing instruction observed during class time. These speculations, however, warrants more formal analysis.

4.3. Other instructional experiences

No significant effects of depressive symptoms on the other instructional experiences investigated were detected. Based on the previously established links between classroom quality and students' time in instruction (as captured by the ISI framework), we anticipated that teachers experiencing more symptoms would direct students to work independently (in CPM instruction) more frequently and would also be less effective at monitoring student behavior, indicated by more student time off-task and in transitions. However, these hypotheses were not substantiated, suggesting that the influence of teachers' depressive symptoms is more likely to surface in the types of instruction they apply *directly*, such as teacher-facilitated instruction and planning/organizing, rather than types of instruction/monitoring in which they play a more passive role. Of note, however, a small positive correlation between teachers' depressive symptoms and students' time spent off-task was detected in preliminary analyses. While this relation was not

substantiated in aim analyses, this does serve to suggest some type of relation between these two factors that warrants further investigation.

While not directly tested in the present study, it could also be that the influence of teachers' depressive symptoms on these more passive (on the part of the teacher) instructional experiences is a function of students' own characteristics such as behavior or academic risk status. For example, a teacher with more symptoms may direct students they perceive as having more severe problem behaviors to work by themselves more frequently, or may be less able to monitor students with more problem behaviors effectively when these students become off-task. This type of depression-by-student characteristic interaction would be consistent with recent findings (e.g., McLean & Connor, 2015, 2017) in which teacher characteristics and instructional experiences were found to uniquely impact academically underperforming students.

Regarding the role of the chosen covariates in these relations, student SES and gender were both found to contribute to students' time spent in teacher-facilitated, whole-class instruction, with students of lower SES spending less time in this type of instruction and girls spending more time. The significant influence of depression beyond that of the covariates strengthens our conclusion that depression does indeed relate to the amounts of teacher-facilitated, whole-class instruction students experience. Additionally, although teachers' depressive symptoms did not predict either type of child/peer-managed instruction (small-group and individual), teacher years of experience was found to negatively associate with child/peer-managed, small-group instruction, and girls were found to experience more child/peer-managed, individual instruction. These findings further suggest the potential for student characteristics to moderate the associations between teachers' depressive symptoms and students' instructional experiences, and this should be considered in future investigations.

4.4. Additional considerations

In addition to interpreting the statistical significance of results, it is important to consider findings in terms of cumulative differences in students' instructional experiences across the year. For example, when the average daily amount of student time spent in teacher-facilitated academic instruction in a whole-class grouping (as indicated by the average across the three observations) is considered in the context of a whole school year—five days a week of literacy instruction for approximately nine months—it equates to many hours of lost exposure. This same principle can be applied to students' time in planning/organizing instruction: Whereas the student of a teacher experiencing more depressive symptoms might miss out on many hours of planning/organizing instruction across the year, a peer in another classroom might receive comparatively much more and thus may be better prepared to get the most out of academic learning opportunities. It is important to note, however, that while results suggested that teachers with more symptoms utilized these two types of instruction less frequently, we are not able to speak to how students were spending their time in the classroom instead, or the extent to which the patterns detected here were indicative of more or less effective teaching. We expected to reveal increases of student time in child/peer-managed instruction, off-task, and in transitions which would have provided information about what types of instruction teachers with more symptoms might opt to utilize in lieu of “higher-demand” practices, but these effects were not detected. Moreover, the ISI framework as applied in the present study was not intended to assess instructional quality. Rather, instruction was described across the four dimensions of the ISI framework without assigning judgements of value. As such, we cannot say with certainty whether the results revealed regarding TCM-WC and planning/organizing indicate that students of teachers with more symptoms are experiencing lower quality instruction, however findings do identify general differences in student experiences as a function of their teachers' depressive symptoms that provide a foundation upon which future investigations can build.

4.5. Broader implications

These findings have potential implications for student development within the classroom, and speak to school policy and instructional interventions that seek to optimize students' instructional experiences. First, while student learning (and other) outcomes were not directly tested here, we contend that differences in students' instructional experiences (as predicted here by teachers' depressive symptoms and also potentially impacted by additional student/teacher/classroom factors not investigated) could have implications for students' development across multiple domains. For example, past work has shown that elementary students show more growth in literacy when they receive more teacher-facilitated academic instruction (Connor et al., 2014). Further, because planning/organizing instruction is defined by the ISI framework as “instruction that is in service of supporting future academic learning opportunities,” students who receive less of this type of instruction may enter learning opportunities less able to take full advantage of them, which could have implications for their academic engagement and learning outcomes. As such, it could be that one of the mechanisms behind the previously-reported link between teachers' depressive symptoms and students' achievement is missed time in teacher-facilitated learning opportunities and planning/organizing instruction. In addition, less time in these types of experiences could have implications for the quality of teacher/student relationships within the classroom, because for example, when students receive less of these teacher-facilitated types of instruction, they inherently have fewer opportunities to interact with the teacher which may limit opportunities to build a positive relationship.

Thus, at their most general, our results suggest that teachers' depressive symptoms can influence the types and amounts of instruction they apply in the classroom. This finding points to the value of considering teachers' psychological characteristics in professional development efforts aimed at improving their instructional practices. Many intervention programs target teachers' instructional practices (Connor et al., 2013; Diamond, Justice, Siegler, & Snyder, 2013; Duncan et al., 2015; Wilson, 2013). Although these interventions are no doubt important, it could be that they are not reaching their potential for teachers who are experiencing

frequent depressive symptoms. That is, the new knowledge and skills introduced by such interventions might be lost on a teacher experiencing more depressive symptoms because the very nature of these symptoms (fatigue, loss of interest and motivation, lack of ability to engage) may leave them without the motivation, energy, or cognitive space to apply this knowledge in the classroom. In this light, we assert that instructional interventions for teachers would likely benefit from the inclusion of mental health support components such as emotion regulation coaching, resilience, and mindfulness. Notably, such interventions have been empirically tested in classroom contexts with promising results: [Raver et al. \(2008\)](#) sought to improve classroom practices in preschool settings by implementing a multi-component intervention that included weekly professional mental health consultations for teachers that took place during actual classroom instruction. This coaching was in addition to other intervention efforts that focused on teachers' behavior management practices. Results of this study revealed that teachers in the intervention group had more positive classroom climates, were more sensitive to student needs, and were more effective in their behavior management. Further, [Jennings et al. \(2017\)](#) recently reported that an intervention promoting resilience in teachers through mindfulness training (the CARE intervention) not only had positive impacts for teachers themselves, but also showed promise in improving the quality of classroom interactions. These works provide examples of what the incorporation of teachers' mental health support into a classroom-based intervention could look like, as well as evidence that such efforts could result in direct and impactful benefits to both teachers and students.

The present study also provides evidence that systems of mental health support for teachers would likely impact both teachers and their students. Most notably, even outside of direct intervention in the classroom, improving teachers' mental health through the implementation of targeted, school-wide support services could have a positive “trickle down” effect on students through classroom quality and student experiences. Given the higher prevalence of poor mental health among teachers ([Whitaker et al., 2013](#)) as well as high levels of occupational stress and burnout observed among educators ([Ferguson, Frost, & Hall, 2012](#); [Kyriacou, 2001](#); [Loeb, Darling-Hammond, & Luczak, 2005](#); [Montgomery & Rupp, 2005](#)), the importance of providing more mental health support to teachers than is currently offered is becoming more immediate. In fact, recent findings have revealed that positive school climate may act as a buffer against worsening depressive and anxious symptoms among early-career teachers ([McLean & Connor, 2017](#)), highlighting the potential benefit of school-level supports. Moreover, our results indicate that even moderate levels of depressive symptoms relate to students' instructional experiences in potentially meaningful ways. Thus, the benefits of efforts to support teachers' mental health would likely extend to many teachers, not just those reporting high frequencies of symptoms.

4.6. Limitations

Several aspects of this study should be considered when interpreting results. First, students and teachers were not particularly diverse in ethnicity, and teachers were not diverse in gender. It could be that experiences of students and teachers from under-represented groups vary in important ways from what is presented here. Encouragingly though, students and schools varied considerably in school-level socioeconomic status which strengthens the external validity of results. Second, while the number of student participants was adequate, our sample was limited to 32 teachers/classrooms (the level of analysis) and 5 of the 32 teachers did not complete the survey of depressive symptoms. As such, this study suffered from decreased level-2 power and increased chance of Type 1 error. While attempts were made to remedy these shortcomings in analyses through our handling of missing data and inclusion of key covariates, future work should attempt to replicate these results among a larger sample of teachers. Third, all analyses are correlational in nature and so the directionality of effects between teachers' depressive symptoms and students' experiences cannot be determined with certainty. For example, it is likely that teachers' depressive symptoms and classroom/student factors operate bidirectionally, with teacher mental health characteristics influencing the classroom and students therein, and students/classrooms also influencing the mental health of their teachers. Fourth, teachers only reported on their depressive symptoms at one time-point (winter). It is possible for an individual's depressive symptoms to fluctuate across time, and it is likely that teachers may report different levels of symptoms at different points of the year. For example, teachers may experience more stress in the fall as they adjust to their new classes, as well as more stress in the spring as statewide tests are implemented. As such, winter was chosen in an attempt to reflect the most stable time-point of the year, however this assumption has not been verified. Fifth, student academic (and other) outcomes that may have been related to the differing types/amounts of instruction they received were not directly tested, and so our ability to make claims about the implications of these findings for students are limited. Last, we focused on students' instructional experiences during literacy instruction only, and so results cannot be generalized to student experiences during instruction in other content areas. Still, this aspect strengthens the internal validity of results as it eliminates the possibility of differences in students' classroom experiences being content area-dependent rather than related to teachers' depressive symptoms. Important to note as well, the covariates of student SES, student gender, and teacher years of experience were included to strengthen our conclusions that results detected could be reliably attributed to teachers' depressive symptoms; still, it is possible that additional teacher, student and classroom factors could have played a role in the instruction students experienced. For example, past work has identified relations among teachers' self-efficacy and the instruction they implement in the classroom, their classroom management, and their students' cognitive activation ([Holzberger, Philipp, & Kunter, 2013](#)). Other potential influencing factors include, but are not limited to, teacher age, teacher gender, the time of day that literacy was taught (although the majority of observations took place at roughly the same time of day), and additional student characteristics such as academic ability, social skills, and problematic behaviors.

4.7. Directions for future research

Despite these limitations, we are confident that study findings represent a contribution to the field. However, more research is needed to fully understand the role of teachers' mental health in the classroom. Future studies should attempt to replicate and expand

on these results utilizing larger and more diverse samples, incorporating multiple measurements of teachers' depression across time, considering bi-directional and/or reciprocal effects of teacher and student characteristics, and investigating other content areas. Additionally, as past research has revealed that the effects of teachers' depression on students might depend in part on characteristics of the students themselves (McLean & Connor, 2015), future studies should incorporate additional student variables such as behavior and academic achievement as more central factors in the consideration of how teachers' depressive symptoms operate in the classroom. By considering these and other factors along with the findings of the present study, the field can move toward a more functional understanding of the scope and implications of teachers' struggles with mental health, with the goal of providing more effective support to teachers in need and the students they teach.

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